MTU Aero Engines

ANNUAL REPORT 2017

Worldwide. 24/7.











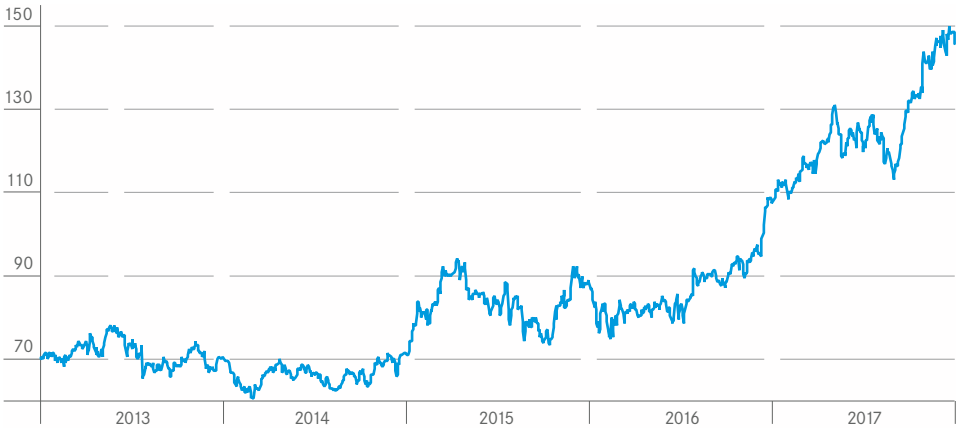

MTU share information

MTU share data

Number of shares	52 million shares of no-par stock
Type of share	Registered shares
Equity capital	€ 52 million
WKN / ISIN /stock exchange symbol	A0D9PT / DE000A0D9PT0 / MTX
Trading segment	Prime Standard
Stock-market segment	MDAX

Share performance and dividends over the past 5 years

	2013	2014	2015	2016	2017
Year-end quoted price	71.39 €	72.16 €	90.10 €	109.80 €	149.40 €
Annual performance	4%	1%	25%	22%	36%
Dividend per share	1.35 €	1.45 €	1.70 €	1.90 €	2.30 €



Selected consolidated financial information and key figures with year-on-year comparison

Selected consolidated financial information and key figures at a glance

in € million (unless stated otherwise)	2017	2016	Change 2017-2016 in %
Revenues and earnings			
Revenues	5,036.3	4,732.7	6.4
attributable to the commercial engine business [1]	2,469.4	2,401.2	2.8
attributable to the military engine business [1]	404.3	504.0	–19.8
attributable to the commercial maintenance business [1]	2,285.3	1,914.4	19.4
Gross profit	769.9	657.9	17.0
Earnings before interest and tax (EBIT)	555.3	452.8	22.6
Earning after tax	381.8	312.6	22.1
Adjusted earnings			
Earnings before interest and tax (EBIT adjusted)	606.6	503.0	20.6
EBIT margin in %	12.0	10.6	
Net income	429.1	345.4	24.2
Balance sheet			
Total assets	6,049.5	5,844.6	3.5
Equity	1,989.8	1,500.5	32.6
Equity ratio in %	32.9	25.7	
Net financial debt	827.0	892.0	–7.3
Cash flow			
Cash flow from operating activities	482.5	358.0	34.8
Cash flow from investing activities	–362.4	–314.0	–15.4
Free cash flow	151.1	82.0	84.3
Cash flow from financing activities	–332.9	223.3	<-100
Number of employees at year end			
Commercial and military engine business	5,599	5,374	4.2
Commercial maintenance business	3,247	2,994	8.5
Total number of employees	8,846	8,368	5.7
Share indicators			
Earnings per share in €			
Undiluted earnings per share	7.35	6.09	20.7
Diluted earnings per share	6.88	5.83	18.0
Dividend per share in € [2]	2.30	1.90	21.1
Dividend yield in %	1.5	1.7	
Total dividend [2]	118.4	97.6	21.3
Outstanding common stock at Dec. 31 (million shares)	51.5	51.4	0.3

[1] Before consolidation

[2] Proposal to the Annual General Meeting for 2017 based on an expected volume of 51.5 million dividend-entitled shares. Prior year: Resolution by the Annual General Meeting for the financial year.

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Worldwide. 24/7.

365 days. 24 hours. 14 locations. 1 objective.

MTU engages in the development, manufacturing, marketing and maintenance of commercial and military aircraft and helicopter engines, as well as industrial gas turbines. The company is dedicated to providing its customers with top-quality, high-tech products and customized services, 24 hours a day, 365 days a year. With 14 locations worldwide, MTU ensures close proximity to its customers. Its objective: to actively shape the future of aviation.

This year's Annual Report provides 12 interesting insights into the world of MTU – its locations, products and services.

Worldwide. 24/7.

Development, production, maintenance.
MTU works around the clock to serve customers across the globe.

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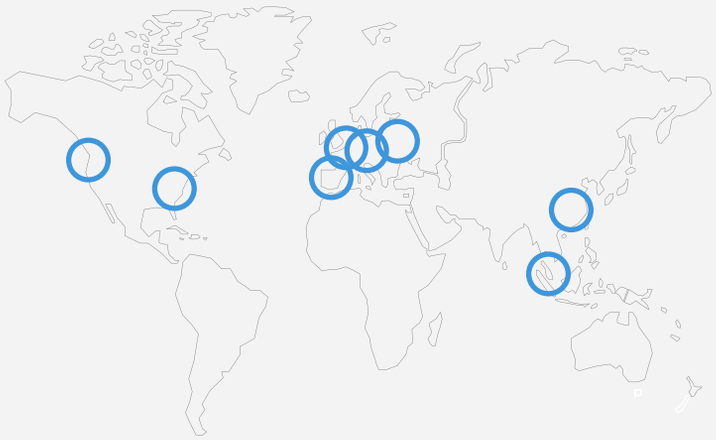
The 24-hour clock sequence relates to Central European Time (CET).

14 locations worldwide

Through its subsidiaries and joint ventures, MTU has a strong presence in all key markets and regions worldwide. MTU has 14 locations in Germany, Poland, the Netherlands, France, China, Malaysia, the USA and Canada.



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Munich
Germany

Top management in dialog: Executive Board meeting at MTU Aero Engines' headquarters in Munich

Munich
Germany

Top management in dialog: Executive Board meeting at MTU Aero Engines' headquarters in Munich

MTU Aero Engines has its headquarters in Munich. The location is the oldest and largest in the MTU network.

The Executive Board determines the direction of MTU's future development. It makes important decisions and aligns the company's strategic focus with the objective of creating sustainable added value. MTU was managed by three Executive Board members in 2017: Chief Executive Officer Reiner Winkler, Chief Program Officer Michael Schreyögg and Chief Operating Officer Dr. Rainer Martens. From 2018, there will be four Executive Board members at the company's helm. Reiner Winkler continues in the post of Chief Executive Officer, Peter Kameritsch assumes responsibility for Finance and Information Technology, Michael Schreyögg remains Chief Program Officer and Lars Wagner succeeds Dr. Rainer Martens as Chief Operating Officer. The latter laid down his mandate at the end of 2017 at his own request.

The members of the Executive Board regularly discuss important measures and events in their respective areas of responsibility (from left: Michael Schreyögg, Reiner Winkler, Dr. Rainer Martens).

Reiner Winkler / Chief Executive Officer (CEO)

Reiner Winkler assumed the position of Chief Executive Officer and Chief Financial Officer at MTU Aero Engines AG in January 2014, including responsibility for Accounting, Financial Controlling, Strategy, Legal Affairs, Corporate Communications and Human Resources. Winkler has been CFO since May 2005. A graduate in business administration, on joining MTU in 2001 he was in charge of the Finance, Human Resources and Information Technology divisions.

Previously, Winkler was managing director finance and controlling at TEMIC Telefunken microelectronic GmbH. He also held management posts with Daimler-Benz AG and Siemens AG.

Reiner Winkler (born 1961) Chief Executive Officer (CEO), appointed term to September 30, 2019

Michael Schreyögg / Chief Program Officer

As a member of the Executive Board, Michael Schreyögg assumed responsibility for MTU's commercial and military OEM programs, including production and spare parts business, and information technology in July 2013. At the beginning of 2015, the Marketing and Sales business of MTU Maintenance was integrated into the programs division.

The graduate in mechanical engineering joined MTU in 1990. During his professional career, he headed various commercial and military engine programs before assuming overall responsibility for the company's defense programs from 2008.

Michael Schreyögg (born 1966) Chief Program Officer, appointed term to June 30, 2021

Dr. Rainer Martens / Chief Operating Officer (COO)

As Chief Operating Officer (COO), Dr. Rainer Martens was a member of the Executive Board at MTU Aero Engines from April 2006. He oversaw development and technology, production and production development, assembly, quality control and procurement, as well as MTU's locations worldwide.

After five years as head of MTU's manufacturing center for turbine blades, he was a production manager at the Airbus plant in Bremen. Holder of a doctorate in mechanical engineering, he also held various management positions at the Airbus plant in Varel and was managing director of CIM-Fabrik Hannover gGmbH.

Martens resigned from MTU's Executive Board from December 31, 2017 at his own request.

Dr. Rainer Martens (born 1961) Chief Operating Operator (COO), until December 31, 2017

New from January 1, 2018:

Peter Kameritsch / Chief Financial Officer and Chief Information Officer (CFO/CIO)

Effective January 2018, Peter Kameritsch has been appointed as a member of MTU's Executive Board with responsibility for Finance and Information Technology. Kameritsch has a university background with degrees in physics and business administration and joined MTU in 1999. He has worked in various management positions in finance, investor relations and corporate strategy at various MTU locations. Before his appointment to the Executive Board, Kameritsch held the position of Senior Vice President, Finance.

Peter Kameritsch (born 1969) Chief Financial Officer and Chief Information Officer, appointed term from January 1, 2018 to December 31, 2020

Lars Wagner / Chief Operating Officer (COO)

Effective January 2018, Lars Wagner has been appointed as a member of MTU's Executive Board with responsibility for the company's operational management. In his role, he oversees the areas of technology and engineering, procurement, production, assembly, corporate quality and production development. Wagner has a university background with a degree in mechanical engineering and an MBA. He was named MTU's Executive Vice President, OEM Operations in July 2015, having previously held a number of management positions with Airbus, including international assignments, most recently in Hamburg.

Lars Wagner (born 1975) Chief Operating Officer, appointed term from January 1, 2018 to December 31, 2020

To our shareholders

Letter to our shareholders

Dear shareholders,

“Worldwide. 24/7” – the title of our 2017 Annual Report says it all. MTU’s self-image is that of a company capable of providing its customers with top-quality, high-tech products and customized services anywhere in the world, 24 hours a day, 365 days a year.

Whichever maintenance shop or manufacturing facility in MTU’s global network you visit, you will find MTU employees working tirelessly to meet customers’ needs and devoted to creating value for the group and its stakeholders. This commendable attitude is something to be proud of. All members of the Executive Board, including myself, know that we can rely on the outstanding teamwork and commitment of our employees, for which they merit our wholehearted thanks.

Their excellent performance in 2017 enabled MTU to report yet another record year. Our revenues increased to € 5.0 billion, the highest-ever level in the company’s history. And our earnings grew at such a pace that we were able to raise our forecast not once but twice in the course of the financial year. As it turned out, the year-end results even slightly surpassed these forecasts, enabling us to set new records with an EBIT adjusted of € 607 million and an adjusted net income of € 429 million.

All business units achieved important milestones in 2017:

The focus of our production activities in the commercial engine business – as in previous years – was the PW1000G family of PurePower® Geared Turbofan™ (GTF) engines. One major challenge in 2017 was to ramp up the production rate of components for the GTF engines already in service with commercial airlines, namely the PW1100G-JM that powers the Airbus A320neo and the PW1500G for the Bombardier C Series. MTU mastered this challenge – not least through the introduction of highly advanced production technology and processes. Our final assembly line, on which around one third of all engines for the A320neo are assembled, is running smoothly, as is our blisk manufacturing facility – and both meet our high standards for quality, throughput and cost efficiency. Together with our partner Pratt & Whitney, we delivered 374 GTF engines to customers last year and thus achieved our delivery target. We also achieved important milestones in the GTF programs that are still at the development stage. In the United States, the Federal Aviation Administration (FAA) issued flightworthiness certificates for the PW1200G, destined to power the Mitsubishi Regional Jet, and the PW1900G engine for the Embraer E-Jet 190-E2. The Irkut MC-21 successfully completed its maiden flight powered by PW1400G engines, as did the Embraer E195-E2 powered by PW1900G engines.

Geared Turbofan™ engines played a similarly important role in MTU’s commercial maintenance business. The joint venture EME Aero, based in Poland, was founded by MTU and Lufthansa Technik for the maintenance, repair and overhaul (MRO) of PW1000G engines. The two companies’ shared aim is to establish the world’s most efficient maintenance shop for GTF engines.

As well as expanding its commercial maintenance portfolio to include new engines such as the Geared Turbofan™ family, MTU has been continuously improving and adding to its services. In Canada, for instance, we added the V2500 to our MRO portfolio in 2017, and built a new test facility for pneumatic starters. Our customers evidently appreciate these efforts: In 2017, we not only renewed numerous existing contracts but also acquired a significant number of new customers.

The capacity utilization of our global network of MRO shops remained high – another indicator of MTU Maintenance's success. Demand was particularly strong for maintenance of the two A320 engines, V2500 and CFM56, and for the CF34 engine that powers numerous business and regional jets.

In the military engine business, the future of the EJ200 engine was uplifted by the latest Eurofighter export deal: Qatar has signed a letter of intent to purchase 24 Eurofighter Typhoons. And we have concluded a framework agreement with the German armed forces for the maintenance of the TP400-D6 engines that power its fleet of A400M military transporters.

Based on the positive results of our activities in 2017, the Supervisory Board and Executive Board intend to propose a further increase in our dividend – to € 2.30 – at the Annual General Meeting on April 11, 2018. In the future, we intend to maintain our policy of offering shareholders an attractive return on their investment by increasing the dividend still further, if earnings permit.

After another record-beating year in 2017, we are in an optimistic mood. Our goals for 2018 are to further strengthen our financial profile and to remain on course for further sustainable growth in our operating activities. The sector in which we expect to see the strongest growth is the series production of commercial engines. We also expect our commercial maintenance business to continue growing at a high rate. Spare parts sales are also likely to increase, while revenues in the military engine business remain stable. We will continue to harness the innovative power of our corporate culture to refine and improve our products and services across all segments, including exploiting all advantages offered by digitalization and grasping all opportunities to systematically identify and develop new markets for MTU's products and services.

The Executive Board welcomes two new members who took up their functions on January 1, 2018: Peter Kameritsch as Chief Financial Officer and Chief Information Officer, and Lars Wagner as Chief Operating Officer. Both have extensive management experience and possess the entrepreneurial spirit that will reinvigorate MTU's future activities. I look forward to our future teamwork as members of the Executive Board. I would like to take this opportunity to thank Dr. Rainer Martens for his many years of valuable support and loyal service as Chief Operating Officer up to the end of 2017. We are indebted to him for many key decisions that set MTU's course in the right direction, especially with regard to Geared Turbofan™ technology and the development of our manufacturing and maintenance locations. It goes without saying that our new executive management team will respect his legacy, giving top priority to creating value for our customers, business partners, employees and other stakeholders.

On behalf of the entire Executive Board, I thank you all for your support and for placing your trust in MTU. The future looks bright for our company, and we are confident that we will be able to sustain and increase its value in the long term. And we would be delighted to continue this journey with you onboard as our shareholders.

Sincerely yours

Reiner Winkler

The MTU share

Bullish stock markets in 2017

2017 was a good year for investors, in which the stock markets reached new record highs and remained largely impervious to political events. The European Central Bank maintained its base rate at 0%, giving further momentum to an already vigorous share market. This generally optimistic mood was particularly noticeable in the post-summer period, when the German DAX rose above 13,000 points for the first time in October. On the last trading day in 2017, the DAX closed on 12,918 points – up by 13% on the previous year. Germany's MDAX, the index comprising 50 of the country's midcap companies including MTU, followed a similar trend. The index rose by 18% in the course of 2017 and closed the year at 26,201 points. The Stoxx Europe TMI Aerospace & Defense Index, which apart from the stocks of Airbus Group, Safran and Rolls-Royce also includes the MTU share, rose by 15%.

MTU share outperforms MDAX

The MTU share continued to gain value throughout 2017. After starting the year at € 109.75, it rose steeply and had passed the € 130 mark by the date of the Annual General Meeting on May 4, 2017. From then on, the MTU share price moved sideways until mid-August, before slipping below the € 120 mark. The negative impact of the weak U.S. dollar was largely canceled out by the upward revision of MTU's full-year earnings forecast in July. The MTU share price came under pressure in mid-August, when analysts' reports pointed to technical challenges associated with the introduction of Geared Turbofan™ engines. But at the end of September, the MTU share began to rally back in a spectacular fashion. Following the publication of MTU's nine-month figures, accompanied by a further increase in the group's earnings forecast, the share price rose to above € 140. The majority of analysts maintained their buy or hold recommendations for the MTU share. On December 5, the MTU share reached a new all-time high of € 153.65. The MTU share closed out 2017 at € 149.40 after a gain of 36%, thus performing notably better than the MDAX.

MTU share: 36% gain in value in 2017

MTU share performance in 2017 compared with stock market indices (baseline Dec. 31, 2016 = 100)

Significant share price gains since the IPO

The MTU share was first listed on the stock market on June 6, 2005. Its issue price was 21 euros. It was admitted to the MDAX soon afterward, on September 19, 2005. By the end of 2016, the share price had passed the € 100 mark, and went on to pass the € 150 mark by the end of 2017. The MTU share has thus multiplied in value by more than 600 % since the IPO.

MTU share indicators year on year

		2017	2016
Highest quoted price[1]	€	153.65	110.95
Lowest quoted price[1]	€	110.50	75.50
Initial quoted price[1]	€	110.70	88.02
Year-end quoted price[1]	€	149.40	109.80
Annual performance[2]	%	+36	+22
Market capitalization at year end	€ million	7,769	5,710
Average daily trading volume	€ million in '000 shares	20 158	13 149
Earnings per share	€	7.35	6.09
Dividend per share	€	2.30[3]	1.90
Dividend payout rate[4]	%	28	28
Dividend yield[5]	%	1.5	1.7

[1] Xetra closing price.
[2] Based on Xetra year-end share price (Dec. 31).
[3] Proposal.
[4] Dividend payout as a percentage of net income adjusted.
[5] Net dividend yield relative to Xetra year-end closing price (Dec. 31).

Dividend

Proposed dividend: € 2.30

At the Annual General Meeting to be held on April 11, 2018, the Executive Board and the Supervisory Board intend to propose a dividend payment of € 2.30 per share for the financial year 2017. The dividend for 2016 was € 1.90. MTU thus continues to pursue its earnings-oriented dividend policy. Investors can expect to receive their dividend payment on April 16, 2018. The dividend payout ratio calculated as a percentage of MTU's net income adjusted is 28 %.

Trading volume

In 2017, the average number of shares that changed hands each day through Xetra trading and the floor trading systems was 158,000, compared with 149,000 shares per day in 2016. The maximum number of shares traded was 3,665,720 on November 30, 2017.

In monetary terms, the average daily trading volume amounted to around € 20 million (2016: € 13 million), placing MTU 12th in the ranking of MDAX companies at the end of 2017 (2016: 17th place). In terms of market capitalization, MTU ranked 6th, with outstanding shares valued at € 7.8 billion (2016: 9th place).

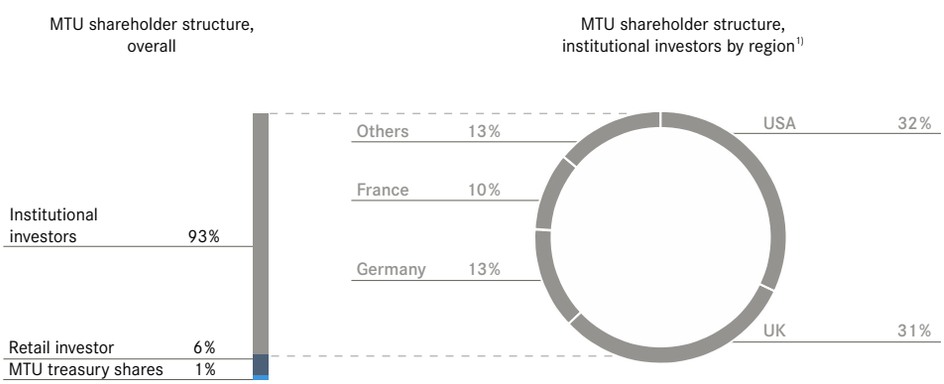
Shareholder structure

93% institutional investors

At December 31, 2017, 99% of MTU shares were in free float and around 1% were held by the company as treasury shares. Of the free-floating shares, some 93% were held by institutional investors and 6% by retail investors. The majority of institutional investors are based in the UK, the USA, Germany and France. At December 31, 2017, the stock market authorities were in possession of notifications pursuant to Section 21 (1) of the German Securities Trading Act (WpHG) from the following institutional investors, each of whom holds more than 3% of the company's voting rights:

- BlackRock Inc., Wilmington, USA (5.82%) – notification dated December 22, 2017
- Euro Pacific Growth Fund, Boston, USA (3.08%) – notification dated July 25, 2017
- The Capital Group Companies, Los Angeles, USA (10.02%) – notification dated May 23, 2017
- Allianz Global Investors GmbH, Frankfurt, Germany (3.02%) – notification dated November 29, 2016
- The Growth Fund of America, Wilmington, USA (3.02%) – notification dated April 25, 2016
- Deutsche Asset & Wealth Management Investment GmbH, Frankfurt, Germany (3.07%) – notification dated November 3, 2015
- Oddo Asset Management, Oddo et Cie, Paris, France (3.03%) – notification dated March 23, 2015
- Massachusetts Financial Services Company, Boston, USA (5.31%) – notification dated December 6, 2013

Shareholder structure



[1] Approximation based on top 50 shareholders.
Source: SID, August 2017.

Analysts

As of the end of December 2017, 27 analysts were reporting regularly on MTU. Buy recommendations were issued by 9 of these financial institutions, while 14 gave the MTU stock a hold rating and 4 recommended selling (2016: 14 “buy”, 11 “hold”, 4 “sell”). The average upside target was € 150.

The following financial institutions report regularly on MTU:

Alpha Value Research	DZ Bank	KeplerCheuvreux
Bankhaus Lampe	Equinet Bank AG	Landesbank Baden-Württemberg
Barclays	Exane BNP Paribas	Natixis
Berenberg Bank	Goldman Sachs	Nord LB
Bernstein Research	Hauck & Aufhäuser	Oddo Securities Research
BoA Merrill Lynch	HSBC Trinkaus & Burkhardt	Raymond James Research
Citi Global Markets Research	Independent Research GmbH	Société Générale
Commerzbank	Investec	UBS
Deutsche Bank	JPMorgan Cazenove	Warburg Research

Investor relations activities

21 roadshows in all key financial centers

With 21 roadshows in all the key financial centers of Europe and the USA, MTU continued to raise its market profile in 2017. The company also took part in 22 international investor conferences, including the Commerzbank German Investment Seminar in New York, Kepler Cheuvreux’s German Corporate Conference in Frankfurt and Goldman Sachs’ European Industrials Conference in London. In addition, numerous investors visited MTU at its headquarters in Munich: in total, some 1,000 investors made use of these opportunities for face-to-face contact with MTU in 2017. A key platform for dialog with shareholders was once again the MTU Annual General Meeting held in Munich on May 4, 2017. It was attended by shareholders representing around 70% of the share capital with voting rights (2016: 65%). Around 60 analysts and investors accepted the invitation to attend the group’s annual Investor and Analyst Day, which was held in Munich on December 12, 2017. Focal topics at the event were the Geared Turbofan™ engine and its market prospects, MTU’s technological orientation in the digital age, effects arising from application of the new IFRS 15 reporting standard, and MTU’s position with regard to the future acquisition of stakes in new engine programs. The company also presented concrete aspects of its long-term outlook through to 2025.

In 2017, MTU’s Annual Report garnered 13th place for MDAX companies in Bilanz magazine’s “Best Annual Reports” category. MTU also scored highly in Institutional Investor’s annual All-Europe Executive Team ranking, winning first place among mid-cap companies in the categories “Best Investor Relations Program” and “Best Analyst Day”.

→ more information available online

The Investor Relations section of the MTU website (www.mtu.de) provides all relevant information. You are also welcome to contact the IR team by calling +49 (0)89 14 89-8473.

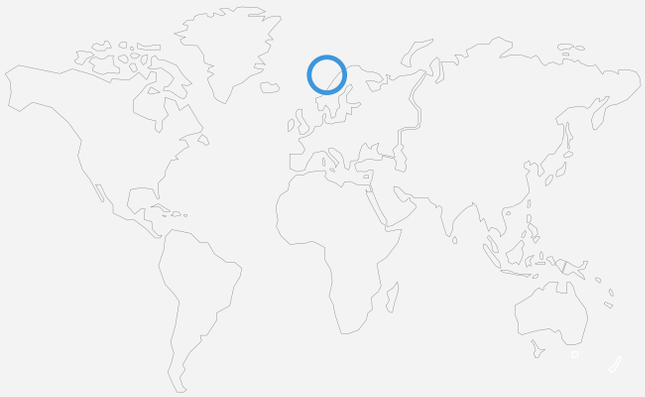
Oil rig

off the Norwegian coast

A global task force: the industrial gas turbine experts from MTU Maintenance

Oil rig

off the Norwegian coast



A global task force: the industrial gas turbine experts from MTU Maintenance

BACKGROUND INFORMATION

Industrial gas turbines

As well as specializing in the maintenance of industrial gas turbines, MTU is also engaged in their manufacturing.

The MTU affiliate Vericor Power Systems in Alpharetta/Georgia, USA, develops and manufactures gas turbines for marine propulsion, mechanical drive and electrical power generation applications.

Gas turbines from Vericor's TF series are used in navy vessels, high-speed ferries, yachts and hydrofoils.

Gas turbines from Vericor's ASE series can run on different fuels and produce an output of up to 3.5 megawatts.

On-site service for oil platforms

It's 9 a.m. and the Norwegian Sea is calmer than usual. The sky is clear, there's a salty tang in the air and a light offshore breeze blows over the drilling platform. The tranquil mood at sea is in stark contrast to the deafening noise produced by the machines on the platform–including the industrial gas turbine (IGT). This ensures the power supply to the small rig, making it completely autonomous. The operator of the drilling platform has many offshore oil and gas production

Industrial gas turbines ensure that oil rigs are energy self-sufficient.

“The IGT business is an important mainstay for our location and accounts for over one third of our revenue.”

André Sinanian, Managing Director of MTU Maintenance Berlin-Brandenburg

facilities and is a long-standing MTU Maintenance customer, for whom, in addition to classic shop maintenance, MTU also assumes on-site service on the platform as well as the provision of spare parts.

Over 35 years of experience

MTU Maintenance Berlin-Brandenburg maintains industrial gas turbines from General Electric’s LM2500™, LM2500+™, LM5000™ and LM6000™ programs, which are derived from aircraft engines, for a large number of companies operating in the fields of electricity generation, marine propulsion systems and compressor stations–both on- and offshore. They all benefit from the 35-plus years of experience MTU Maintenance can draw on in servicing and maintaining industrial gas turbines.

Continuous improvement

The MTU Maintenance team performs most of the repair and maintenance work itself, always with a strong focus on the highest standards of quality–equivalent to those applied in the aviation sector. The processes are continuously refined and improved so as to optimize the availability and reliability of the gas turbines. Besides high-tech processes, efficient workflows ensure a fast turnaround–from dismantling, parts inspection and repair, to re-assembly and subsequent testing. To ensure all goes smoothly, MTU Maintenance has installed one of the world’s largest and most advanced industrial gas turbine test cells in Ludwigsfelde. Here, the aero-derivative gas turbines can be tested under operating conditions.

On-site customer service: MTU maintains and repairs industrial gas turbines–also offshore.

Growth market IGT

Industrial gas turbines have become a significant product area: André Sinanian, Managing Director of MTU Maintenance Berlin-Brandenburg, puts it in a nutshell: “The IGT business is an important mainstay for our location and accounts for over one third of our revenue.” And the segment has a promising future as analysts see substantial growth potential in the industrial gas turbine business. This is one of the reasons why MTU plans to consistently expand maintenance of industrial gas turbines as a key focus of activities going forward.

Corporate governance

Corporate governance report

MTU sets great store by responsible corporate management, which is why the company complies with all the recommendations of the German Corporate Governance Code (GCGC). The corporate governance report pursuant to Section 3.10 of the GCGC qualifies as the corporate governance statement required under Section 289a of the German Commercial Code (HGB) and thus forms part of the combined management report of the MTU Group and MTU Aero Engines AG.

Responsible corporate management

Good corporate governance embraces every area of the company

The term "corporate governance" stands for the practice of administering and controlling a company in accordance with the principles of responsibility and long-term value creation. MTU Aero Engines AG sees good corporate governance as a natural responsibility that embraces every area of the company. That comprises mutual trust and efficient collaboration between the Executive Board and the Supervisory Board, respect for the shareholders' interests and open and transparent communication with all stakeholders. As a company with global operations, MTU acts in compliance with the relevant national and international standards. In Germany, where the company has its headquarters, these standards are laid down principally in the Stock Corporation Act (AktG), in the Co-Determination Act (MitbG) and in the GCGC. In the financial year just passed, the Executive Board and Supervisory Board closely studied the GCGC, the latest version of which was published on February 7, 2017.

As part of the corporate governance statement pursuant to Section 289a of the German Commercial Code (HGB), which constitutes the corporate governance report according to Section 3.10 of the GCGC, the Executive Board and Supervisory Board of MTU Aero Engines AG hereby make the following declaration of conformity:

Declaration of conformity with the German Corporate Governance Code by the Executive Board and Supervisory Board of MTU Aero Engines AG, pursuant to Section 161 of the German Stock Corporation Act (AktG)

The Executive Board and the Supervisory Board of MTU Aero Engines AG declare that the recommendations of the Government Commission on the German Corporate Governance Code, as published in the amended version of February 7, 2017 by the Federal Ministry of Justice in the official section of the Federal Gazette, have been and are being complied with in their entirety.

Munich, December 2017

For the Executive Board

Reiner Winkler
Chairman

For the Supervisory Board

Klaus Eberhardt
Chairman

The practice of corporate management

Accepting responsibility – not only for our products and processes, employees, customers and partners, but in equal measure for the environment and society as a whole – forms an integral part of MTU's corporate culture. MTU is committed to sustainable development, and its contribution in this area goes above and beyond the minimum legal requirements. The focus of this social commitment falls on environmental protection, human resources policy and community outreach projects in the neighborhood of MTU sites. These commitments are publicly documented on the MTU website at www.mtu.de under Company > Corporate Responsibility.

→ more information available online under Company > Corporate Responsibility

The company has formulated a code of conduct, which constitutes a binding standard to be observed by all employees. The code of conduct can be downloaded from the company's website at www.mtu.de under Company > Compliance > Code of Conduct.

→ more information available online under Company > Compliance > Code of Conduct

MTU attaches great importance to maintaining an open, ongoing dialog with its target groups. The company communicates with these groups via many channels, including the intranet and internet, company brochures, employee and customer magazines, as well as in person at events. The goal of this communication is to generate broad public acceptance.

MTU insists on the finest quality for its products and services. Compliance with quality standards is verified by government agencies and through internal and external audits. The quality standards are published on the MTU website at www.mtu.de under Engines > Quality.

→ more information available online under Engines > Quality

Trust-based cooperation among governing bodies

MTU is a stock corporation organized under German law. Its governing bodies are the Executive Board, the Supervisory Board and the Annual General Meeting. The close cooperation between the Executive Board and the Supervisory Board is based on trust, and they share information with each other in a reliable and regular manner. The Annual General Meeting, in particular, offers shareholders the opportunity to present questions to MTU executives and to exercise their voting rights.

Working procedures of the Executive Board

All Executive Board members share joint responsibility

In managing MTU, the Executive Board's goal is to create, on its own responsibility and in the company's interest, sustainable added value, taking into account the interests of its shareholders, employees and other stakeholders. The Executive Board works as a team, with its members bearing joint responsibility. The members of the Executive Board regularly discuss important measures and events within their respective remits. Their qualifications and professional experience differ and complement each other. The company's Executive Board consisted of three members in 2017. As of January 1, 2018, it will consist of 4 members.

The Supervisory Board is briefed by the Executive Board in a regular, timely and comprehensive manner on the situation of the company, in particular on strategy, the status of planning, the achievement of targets, the company's risk situation and its risk management activities. The Executive Board coordinates decisions of a strategic nature with the Supervisory Board, ensures that such decisions are implemented and discusses the progress made. Once a month, the Supervisory Board receives written reports on the company's earnings, financial situation and net asset position. Any deviations from the planned operational performance are explained in detail to the Supervisory Board. Furthermore, the chair of the Supervisory Board is briefed regularly and in person on the company's current situation, significant business transactions and important pending decisions.

The Executive Board also receives regular reports on compliance, i.e. on the measures taken to comply with laws and regulations as well as with company guidelines.

Important Executive Board decisions, in particular those concerning the budget, require the approval of the Supervisory Board. The Supervisory Board provides information on these matters in its report on page 48. The Executive Board's rules of procedure, along with the list of transactions by MTU Aero Engines AG requiring Supervisory Board approval, can be viewed on the company website at www.mtu.de under Investor Relations > Corporate Governance.

→ more information available online under Corporate Governance

Working procedures of the Supervisory Board

Decisions of consequence require approval

In line with statutory requirements, the Supervisory Board comprises six shareholder representatives and six employee representatives. It appoints the Executive Board, oversees the latter's work and provides advisory support. Decisions of consequence for the company require the approval of the Supervisory Board. All Supervisory Board members are qualified for these tasks and properly perform their mandated duties. In compliance with the GCGC, only one former member of the Executive Board of MTU Aero Engines AG, namely Prof. Dr.-Ing. Klaus Steffens, sits on the Supervisory Board; the GCGC recommends no more than two. The Supervisory Board is entrusted with gauging the independence of its own members, whereby as a matter of principle it considers the employee representatives as independent. This condition is deemed to be fulfilled when the majority of the members of the Supervisory Board may be regarded as independent. In its present composition, this applies to all members of the Supervisory Board, thus ensuring that the Executive Board receives independent advice and monitoring both at plenary meetings of the Supervisory Board and at meetings of its committees.

The Supervisory Board's rules of procedure make provision for its members to form committees. MTU's Supervisory Board has four committees, details of which can be found on page 53.

→ further information on page 53

The Supervisory Board's rules of procedure contain binding provisions for dealing with conflicts of interest. Such conflicts are to be disclosed and, where appropriate, may result in termination of the member's mandate. In addition, the Supervisory Board must explicitly state such potential conflicts of interest in the nomination proposals it makes to the Annual General Meeting. In 2017, no consulting agreements, contracts for services or similar contractual agreements existed between the members of the Supervisory Board and MTU Aero Engines AG or any of its subsidiaries. Neither in this, nor any other area did any conflicts of interest arise that required disclosure.

The Supervisory Board has defined concrete objectives for its composition and drawn up a profile of skills and expertise for the entire board, which it judges satisfactorily met at the present time. This profile will form the basis of all future nominations presented for approval by the Annual General Meeting. The profile of skills and expertise is published on the MTU website.

→ More information available online

In the financial year 2017, directors' and officers' liability insurance was in effect for the MTU Executive Board and Supervisory Board members. The cover includes a deductible amounting to 10% of the loss incurred, up to a maximum of 1.5 times the board member's annual fixed compensation.

Compensation for the members of the Executive Board and Supervisory Board is established in accordance with clear, transparent criteria, which are described in the management compensation report on page 35 et. seq.

→ further information on page 35 et. seq.

Diversity

As the diversity of MTU's workforce is a decisive factor in the company's success, it is a topic to which MTU attaches great importance. In particular, MTU's human resources policy focuses on ensuring that the criteria of internationality and the fair representation of women are respected.

Diversity also has an important role to play in the Supervisory Board, which has set itself the following goals as regards its future composition. As a company with global operations, MTU has a keen interest in ensuring that the members of its corporate bodies have an international background, which is why at least one member of the Supervisory Board should meet this criterion. The MTU Supervisory Board already includes members who trained in other countries or have spent substantial portions of their careers abroad, and the company intends to ensure that the members of the Supervisory Board continue to contribute their international experience going forward. The Supervisory Board has two female members, Heike Madan and Prof. Dr. Marion A. Weissenberger-Eibl, so that both the employees and the shareholders have women representing their interests on the board. In compliance with both the German Stock Corporation Act and the GCGC, the Supervisory Boards of listed companies subject to the Co-Determination Act must comprise at least 30% women and at least 30% men. In order to achieve this quota, as of 2016, the Supervisory Board pays heed to the new requirement in all decisions regarding individual or multiple appointments of members.

Another requirement is that the supervisory boards of companies that are listed or subject to the Co-Determination Act must set target quotas for women on their supervisory and executive boards. In addition, the Executive Board is obliged to set a target quota for women in the two echelons of management directly below the Executive Board. Given the management and supervisory-board structure of the MTU companies in Germany – namely a sole managing director and (until now) three-member supervisory boards on which the interests of shareholders and employees must be equally represented – the company has determined a target women's quota of 0% for the period until June 2017. At management level – which comprises tier-1 (OFK), tier-2 (FK) and tier-3 (EFK) managers – the target women's quota for the period until June 2017 had been set at 11% for MTU's sites in Germany. The actual quota lies slightly below the target, at 10%, due to the larger than expected number of women on maternity leave. There were not enough high-potential female candidates to fill these temporary vacancies. The Executive Board has set a new quota of 13% for women in management positions at the MTU sites in Germany, which it aims to achieve by mid-2022. The MTU Maintenance locations in Hannover and Ludwigsfelde are treated as exceptions, and are not expected to appoint women to their managing or supervisory boards in the foreseeable future, hence a target of 0%.

Target quota of 13% for women in management by 2022

Nonetheless, MTU is continuing to pursue its goal of raising the number of both women employees and women managers. Every area of the company is called upon to work actively toward achieving this corporate objective. The company has long-established measures in place to increase the share of women in management and is continually honing and enhancing these. They include, for instance, career counseling for women with potential as well as various mentoring programs. Other measures address both men and women and are designed to improve work-life balance. They include part-time management posts, job sharing and teleworking.

The Supervisory Board also places value on fostering diversity in appointments to the Executive Board. The members of the latter have diverse qualifications and work experience, which contribute to their work on the board. In line with the amendments to the German Stock Corporation Act and the German Corporate Governance Code, the Supervisory Board revised its target quota for women members on the Executive Board to 25% by the year 2022.

The Supervisory Board's rules of procedure already contain an age-limit provision for Supervisory Board members, in accordance with which members must relinquish their seats after the Annual General Meeting that follows their 72nd birthday. Moreover, a general limit of four terms of office has been set for serving on the Supervisory Board.

The Supervisory Board takes the above-mentioned goals into account when submitting nomination proposals to the Annual General Meeting. The same applies to the Nomination Committee, which is responsible for preparing the vote of the Supervisory Board. Since the main criterion for any nomination proposal is still the company's interest, the Supervisory Board shall propose the candidates that best meet the requirements.

Financial reporting

MTU prepares its consolidated financial statements and its interim reports in accordance with the International Financial Reporting Standards (IFRS) on the responsibility of the Executive Board. The financial statements of the parent company are compiled in accordance with the provisions of the German Commercial Code (HGB). An internal system of controls coupled with the application of uniform principles of accounting ensures that the earnings, financial situation, net asset position and cash flows of all group companies are accurately presented. In addition, MTU has a differentiated system in place to identify and monitor business and financial risks.

Risk management and control system

→ further information on page 140 et. seq.

The Executive Board is responsible for ensuring that an appropriate risk management and control system is in place. This system is described on page 140 et. seq. The Executive Board reports to the Supervisory Board in a regular and timely manner on existing opportunities and risks, and how they are developing.

The Audit Committee of the Supervisory Board deliberates on risk management. In accordance with Section 107 (3) of the German Stock Corporation Act (AktG), as amended by the German Accounting Law Modernization Act (BilMoG), the Audit Committee is explicitly responsible for monitoring the effectiveness of the risk management system, the internal control and auditing systems, the financial reporting process and the audit of the financial statements, and, in particular, for assessing the auditors' independence.

Compliance

The corporate culture at MTU sets great store by the values of trust and mutual respect. Nevertheless, the risk can never be entirely ruled out that unauthorized behavior of isolated individuals might lead to contravention of the law. MTU does everything in its power to minimize this risk as far as possible, and is committed to preventing acts of misconduct, such as corruption, in the first place through regular targeted training measures, and to uncovering and pursuing any such acts that are committed.

The observance of legal and ethical rules and principles plays a central role in this respect. These and other aspects of compliance, such as the responsible handling of insider information, are documented in a code of conduct drawn up and introduced jointly by the MTU Executive Board and the Group Works Council. This code of conduct embodies MTU's corporate culture and reflects its resolve to comply strictly with the stipulations of the relevant laws and internal regulations. It is a company-wide guide to ethical business relations.

Code of conduct embodies corporate culture

Compliance is an important aspect of all management functions at MTU. For example, all managers must verify that each and every member of their staff has read and understood the code of conduct and is abiding by its rules. Reinforcement is provided by internal training courses. MTU has set up a Compliance Board, which holds regular meetings once a quarter and reports directly to the Executive Board. Its duties include identifying and evaluating legal and reputational risks. Where necessary, it recommends additional compliance rules to the Executive Board. Above and beyond this, the Compliance Board coordinates the measures taken in specific cases of non-compliance. In agreement with the Works Council, the company has set up an internal compliance office that staff, customers and suppliers may contact if they suspect unethical conduct.

Status reports on the activities of the Compliance Board are presented at meetings of the Supervisory Board's Audit Committee. The Audit Committee then informs the plenary meetings of the Supervisory Board via a summary of its own meetings. The Supervisory Board's Audit Committee oversees the Executive Board's compliance activities. This includes proposing new rules for incorporation in the compliance guidelines and monitoring the measures and training programs implemented by the Compliance Board.

A full information service

In keeping with the principles of good corporate governance, MTU issues a regular flow of comprehensive, timely information on the company's activities and any major developments in its business situation to shareholders, shareholder associations, financial analysts, the media and other interested parties. MTU strives to ensure that all stakeholders are kept informed in equal measure. The company publishes a full range of information on its website at www.mtu.de. It publishes quarterly reports on its business activities, and any new developments likely to have a significant impact on the MTU share price are disclosed in the form of ad hoc releases in accordance with statutory requirements.

→ more information available online

Information is also posted on the MTU website whenever members of the Executive Board or Supervisory Board or related persons have purchased or sold MTU shares or share-based derivatives. Section 15a of the German Securities Trading Act (WpHG) stipulates that this group of persons must disclose such transactions if and when their value reaches or exceeds € 5,000 within a single calendar year.

Amsterdam

Netherlands

Based in the Netherlands, serving customers worldwide: engine leasing and asset management at MTU


Worldwide. 24/7.

Amsterdam

Netherlands

Based in the Netherlands, serving customers worldwide: engine leasing and asset management at MTU

Leasing offers airlines greater flexibility and lower costs of capital.

Sophisticated architecture, modern facades: MTU's leasing experts have their offices in the World Trade Center Amsterdam, not far from Beatrixpark.

Growing trend toward leasing

Emerging from a meeting at 10 a.m., Martin Friis-Petersen, Managing Director of MTU Maintenance Lease Services B.V. (MLS), sits down at his desk in his Amsterdam office. He has just finalized the details of a leasing contract with a customer. His expertise is in higher demand than ever: "These days, more and more airlines are leasing aircraft and engines, with demand especially for short-term leases continuing to grow," Friis-Petersen notes. The advantage with leasing: greater flexibility and lower costs of capital.

Joint ventures pool expertise

In 2013, MTU established two joint ventures with Sumitomo, a leading Japanese trading company, to better meet the increasing demand on the part of airlines for financing models: MTU

With their expertise, MTU's specialists show their customers how wise asset management can help them maximize an engine's recycling value.

Maintenance Lease Services (MLS), in which MTU holds an 80-percent stake, and Sumisho Aero Engine Lease with an MTU interest of ten percent. Both companies specialize in engine leasing and are headquartered in Amsterdam. While MLS focuses on short- and medium-term leasing business, Sumisho Aero Engine Lease provides long-term solutions.

Service-plus asset and material management

Alongside leasing business, MLS also focuses on the recycling of engine components under its asset and material management program. "We have received the clear message from our customers that they expect a comprehensive service that enables them to efficiently manage their engines. So we added asset and material management to our portfolio to enable us to optimize an engine's value for our customers," Friis-Petersen explains. Customers benefit from the ability of MTU's experts to reliably assess the market and the condition of an engine and its parts, enabling them to decide whether it is more cost-effective to carry out repairs, continue to lease or the perfect time to dismantle the engine into its component parts for recycling. Ultimately, asset management is all about finding customized solutions to meet individual customer requirements.

BACKGROUND INFORMATION

Current trend: leasing

Aircraft leasing

The percentage of leased passenger aircraft and freighters in the worldwide fleet of aircraft has grown steadily in recent years.

In 1970, less than one percent of aircraft were leased, ten years later that figure was 1.7 percent; by 1990 it was almost ten times that. In the meantime, the figure is estimated at over 40 percent.

Engine leasing

For the past several years, engine leasing has gained in popularity – a trend that is also on the up. Lessors include original equipment manufacturers (OEMs) and independent providers.

MTU is one of the players in this growing market.

Management compensation report

The management compensation report describes the principles applied when establishing the compensation to be awarded to members of the Executive Board and Supervisory Board of MTU Aero Engines AG, and states the amount and composition of that compensation. The management compensation report follows the provisions of Section 314 (1) no. 6 of the German Commercial Code (HGB), German Accounting Standard DRS 17 “Reporting on the remuneration of members of governing bodies,” the recommendations of the German Corporate Governance Code (GCGC), and the International Financial Reporting Standards (IFRSs).

Principles of the compensation system for members of the Executive Board

At the proposal of the Personnel Committee, which is independent in the meaning of the GCGC, the Supervisory Board decides on a system of compensation for the members of the Executive Board, including the main components of their contracts such as the amount and composition of the total compensation, which includes non-performance-related and performance-related components. The Personnel Committee reviews the appropriateness and the alignment with the market of the management compensation at regular intervals. This includes compiling regular comparisons of MTU and selected peer companies with the support of an independent compensation expert. This benchmarking is conducted on a sector-specific basis by taking into account 21 companies from the industrial and capital goods sector which are listed in the DAX and MDAX stock indexes. The Personnel Committee concluded from these comparisons that MTU’s Executive Board compensation lies within the average bandwidth for these peer companies.

Developed with the support of independent external compensation experts, the present management compensation system is oriented toward the company’s positive and sustainable development. The remuneration awarded to the members of the Executive Board is therefore composed of non-performance-related and performance-related components, particularly in the form of a long-term incentive. This ensures that corporate management is optimally aligned with the long-term interests of the company and its investors. The management compensation system is thus aligned with market conditions and was introduced in its current form from the financial year 2016.

Structure of the total compensation

Structure of the compensation system (total target direct compensation)

Non-performance-related components	~ 40%	Basic salary	Fixed compensation Fringe benefits
Performance-related components / variable compensation	~ 60%	Short-Term Incentive (STI)	~ 40% of the variable portion of the compensation Key characteristics: Distribution based on goal achievement as regards EBIT adjusted and free cash flow Limitation 0 – 180% (Extraordinary performance bonus/malus (in accordance with the GCGC) of up to 20%)
		Long-Term Incentive (LTI) / Restricted Stock Plan (RSP)	~ 60% of the variable portion of the compensation Key characteristics: Distribution based on 3-year goal achievement as regards EBIT adjusted and free cash flow Limitation 0 - 180% Awarded in MTU shares (Vesting period 4 years)

Non-performance-related components

The non-performance-related compensation (basic salary), which makes up around 40% of the total compensation, is paid on a monthly basis and consists of the fixed compensation and fringe benefits. The latter comprise taxable reimbursements of expenses and the noncash benefit deriving from payments in kind such as insurance premiums and the use of a company car for business and private purposes, including any taxes on such benefits paid by the company.

Performance-related components

The performance-related compensation makes up around 60% of the total compensation and consists of a short-term incentive (STI) plan – referred to in previous years as the Annual Performance Bonus (APB) – and a long-term incentive (LTI) in the form of the Restricted Stock Plan (RSP).

Short-term incentive (STI)
A short-term incentive (STI) plan has been established for members of the Executive Board. Payments under this plan represent around 40% of the performance-related management compensation.

The actual payout depends on the achievement of two equally weighted performance criteria at group level – EBIT adjusted and free cash flow. The targets to be achieved in the respective financial year to ensure payment of 100% of the short-term incentive are set annually in advance by the Supervisory Board, taking the operational business planning figures into account. In addition, a threshold is set at 70% below the target level for each performance metric which, if achieved, corresponds to an STI entitlement of 50%. Should this threshold not be met, no STI shall be payable. Similarly, the maximum award is limited to 180% which is payable if the maximum achievement level of 115% is reached in respect of the targets set for each of the two performance metrics. Between the threshold, the 100% level and the maximum achievement limit, the entitlement is interpolated using a straight-line method. The effective STI entitlement is calculated on the basis of the arithmetical mean of the achievement of the two performance targets. As stipulated in the GCGC, the Supervisory Board is entitled to take each Executive Board member's individual performance into account by adjusting the STI entitlement for the respective financial year by up to 20% (bonus/malus), based on the individual performance determined by the Supervisory Board. In this regard, the Supervisory Board resolved in March 2011 generally not to apply a bonus or malus regulation. Accordingly, the STI entitlement was not adjusted in 2017 or in 2016.

Long-term incentive (LTI)
A performance-related long-term incentive is awarded in the form of the Restricted Stock Plan (RSP). This compensation component is share-based and represents around 60% of the variable portion of the total compensation. The RSP is awarded in the form of a cash settlement, subject to income tax, the full net amount of which the respective member of the Executive Board must immediately reinvest in MTU shares subject to disposal restrictions. The shares awarded under this plan must be held for a vesting period of four years.

To strengthen the long-term incentive effect of this compensation component, the value of these RSP shares at the grant date is adjusted according to a long-term performance target. The latter is calculated by taking the arithmetical mean of the STI entitlements established for the three financial years preceding the year in which the RSP shares were granted. It is capped at a maximum of 180%. In the case that a new Executive Board member joins the company, their multi-year performance level for the missing years is established by assuming an STI entitlement of 100%.

Beyond that, the employment contracts of the Executive Board members do not stipulate any share ownership guidelines. Nevertheless, the share ownership guidelines[1] applied by a limited number of MDAX-listed companies were fulfilled by the CEO of MTU in 2017 and 2016.

[1] According to an analysis of the 50 MDAX-listed companies by an independent consultant, only 8 of them implement share ownership guidelines. The strictest rules concerning share ownership quotas are applied by 2 companies, whose CEOs are required to invest at least 200% of their annual basic salary in shares of the company they direct.

Value of performance-related components

Short-term incentive (STI)

The performance targets set by the Supervisory Board for the 2017 STI were € 525.0 million for "EBIT adjusted" (actual EBIT adjusted in 2017: € 606.6 million) and € 110.0 million for "free cash flow" (actual free cash flow in 2017: € 151.1 million).

The achievement of the two key performance indicators at group level was 115.54% (2016: 108.17%) for EBIT adjusted and 137.36% (2016: 112.00%) for free cash flow. The overall achievement was thus 126.45% (2016: 110.09%), resulting in an STI entitlement of 180.00% (2016: 153.81%).

Long-term incentive (LTI)

The value of Restricted Stock Plan (RSP) shares at the grant date is derived in the reporting period from the fixed amount of the total compensation allocated for this purpose and the multi-year performance target reached. The latter was calculated for each Executive Board member in 2017 by taking the arithmetical mean of the STI entitlements established for the financial years 2014, 2015 and 2016.

The following numbers of MTU shares (with a vesting period of four years from the date of acquisition) were acquired by Executive Board members under the terms of the RSP:

Purchased RSP shares

Executive Board members	Year	Number of shares	Purchase price per share	Vesting period until
Reiner Winkler	**2017**	**4,339**	**130.55**	**April 30, 2021**
	2016	6,051	82.87	April 30, 2020
Dr. Rainer Martens	**2017**	**2,697**	**130.55**	**April 30, 2021**
	2016	3,761	82.87	April 30, 2020
Michael Schreyögg	**2017**	**2,896**	**130.55**	**April 30, 2021**
	2016	4,038	82.87	April 30, 2020

The following table shows the basis for establishing the multi-year achievement level in respect of the Restricted Stock Plan (RSP):

Entitlements granted in respect of variable compensation (in %)

	2017	2016	2015	2014	2013
STI	180,00	153.81	170,61	149.17	95.74
LTI / RSP	157,86	138.51			

Compensation of individual members of the Executive Board

Benefits granted (target figures) for 2017 (GCGC)

In line with the recommendations of the German Corporate Governance Code (GCGC) (model table), the following table shows benefits granted for the financial years 2017 and 2016 as well as the minimum and maximum amounts applicable for the financial year 2017 based on the 100% goal achievement:

Benefits granted

Executive Board member		**Reiner Winkler** Chief Executive Officer		
Individual items in €	**2017**	2017 (Min)	2017 (Max)	2016
Fixed compensation	750,000	750,000	750,000	750,000
Fringe benefits[1]	27,163	27,163	27,163	27,767
Subtotal	**777,163**	**777,163**	**777,163**	**777,767**
STI	540,000		1,166,400	540,000
RSP / LTI	740,000		1,332,000	740,000
Total fixed and variable compensation	**2,057,163**	**777,163**	**3,275,563**	**2,057,767**
Service cost in accordance with IAS 19	225,211	225,211	225,211	215,398
Total compensation (GCGC)	**2,282,374**	**1,002,374**	**3,500,774**	**2,273,165**

Executive Board member		**Dr. Rainer Martens** Chief Operating Officer until December 31, 2017		
Individual items in €	**2017**	2017 (Min)	2017 (Max)	2016
Fixed compensation	500,004	500,004	500,004	500,004
Fringe benefits[1]	8,643	8,643	8,643	15,664
Subtotal	**508,647**	**508,647**	**508,647**	**515,668**
STI	310,000		669,600	310,000
RSP / LTI	460,000		828,000	460,000
Total fixed and variable compensation	**1,278,647**	**508,647**	**2,006,247**	**1,285,668**
Service cost in accordance with IAS 19	189,235	189,235	189,235	181,990
Total compensation (GCGC)	**1,467,882**	**697,882**	**2,195,482**	**1,467,658**

Benefits granted (cont.)

Executive Board member		**Michael Schreyögg** Chief Program Officer		
Individual items in €	2017	2017 (Min)	2017 (Max)	2016
Fixed compensation	500,004	500,004	500,004	500,004
Fringe benefits[1]	31,043	31,043	31,043	25,790
Subtotal	**531,047**	**531,047**	**531,047**	**525,794**
STI	310,000		669,600	310,000
RSP / LTI	460,000		828,000	460,000
Total fixed and variable compensation	**1,301,047**	**531,047**	**2,028,647**	**1,295,794**
Service cost in accordance with IAS 19	116,834	116,834	116,834	107,825
Total compensation (GCGC)	**1,417,881**	**647,881**	**2,145,481**	**1,403,619**

[1] Fringe benefits include charges to taxable income covering personal use of company vehicles amounting to € 61,445 (2015: € 63,814) and premiums for insurance policies taken out on behalf of members of the Executive Board amounting to € 5,404 (2015: € 5,407).

Prerequisites for achieving the maximum amounts of variable compensation awarded in 2017

One-year variable compensation	
STI	Target achievement of EBIT adjusted 115% (STI entitlement 180%) and
	Target achievement of free cash flow 115% (STI entitlement 180%) and
	Extraordinary performance bonus/malus (in accordance with the GCGC) of up to 20%
Multi-year variable compensation	
LTI / RSP	STI entitlement 3 years prior to grant date 180% and
	STI entitlement 2 years prior to grant date 180% and
	STI entitlement 1 year prior to grant date 180%

Compensation for the financial year 2017 under the German Commercial Code (Section 314 (1) no. 6a HGB) and allocation in the reporting period (GCGC)

The members of the Executive Board were awarded total compensation determined under the German Commercial Code (HGB) amounting to €7.5 million (2016: €7.6 million) for their activities on the board in the financial year 2017. Of this amount, €1.8 million (2016: €1.8 million) was non-performance-related and €5.7 million (2016: €5.8 million) was performance-related.

The table below shows the total compensation for the individual members of the Executive Board for the years 2017 and 2016 as defined by Section 314 (1) no. 6a HGB, and, in accordance with the German Corporate Governance Code (GCGC) recommendations (model table), the allocation of fixed and variable compensation for the financial years 2017 and 2016 as well as the service cost (benefit expense) for the pension plan:

Total compensation (HGB)/allocation (GCGC)

Executive Board member	**Reiner Winkler** Chief Executive Officer		**Dr. Rainer Martens** Chief Operating Officer until December 31, 2017		**Michael Schreyögg** Chief Program Officer	
in €	2017	2016	2017	2016	2017	2016
Fixed compensation	750,000	750,000	500,004	500,004	500,004	500,004
Fringe benefits [1]	27,163	27,767	8,643	15,664	31,043	25,790
Subtotal	**777,163**	**777,767**	**508,647**	**515,668**	**531,047**	**525,794**
STI	972,000	830,574	558,000	476,811	558,000	476,811
LTI	1,168,164	1,024,974	726,156	637,146	726,156	637,146
Deferred STI 1 [2]		354,261		246,014		246,014
Deferred STI 2 [2]	414,583	309,742	287,905	205,204	287,905	180,037
Total compensation (Section 314 (1) no. 6a HGB)	**3,331,910**	**3,297,318**	**2,080,708**	**2,080,843**	**2,103,108**	**2,065,802**
PSP 2012 (vesting period: 4 years) [2]		525,921		473,354		
Settlement for PSP, SMP [2]		1,589,792		1,178,025		836,197
Total fixed and variable compensation	**3,331,910**	**5,413,031**	**2,080,708**	**3,732,222**	**2,103,108**	**2,901,999**
Service cost in accordance with IAS 19	225,211	215,398	189,235	181,990	116,834	107,825
Total compensation (GCGC)	**3,557,121**	**5,628,429**	**2,269,943**	**3,914,212**	**2,219,942**	**3,009,824**

[1] Fringe benefits include charges to taxable income covering personal use of company vehicles amounting to € 61,445 (2015: € 63,814) and premiums for insurance policies taken out on behalf of members of the Executive Board amounting to € 5,404 (2015: € 5,407).

[2] Awarded under the management compensation system in place until the end of financial year 2015. See under "Subsequent effects of the compensation system up until December 31, 2015".

Members of the Executive Board did not receive any compensation for mandates on boards of MTU group companies, nor were they granted any loan facilities by the company in 2017 or 2016.

Subsequent effects of the management compensation system up until December 31, 2015

The management compensation system was modified with effect from the financial year 2016. The objective was to make the compensation system easier to understand by reducing its complexity, and thus increase transparency. In 2017 and 2016, deferred components were awarded in respect of the multi-year performance-based variable compensation under the old compensation system. The tables showing the compensation of the individual Executive Board members therefore also include deferred components from prior periods. The impacts of this are described in the following. For a full description of the previous compensation system in place until the end of 2015, please refer to the management compensation report in the Annual Report 2015.

Deferred STI payment

Until the financial year 2015, only 50% of the STI was paid out in the calendar year following the financial year in which it was awarded, the deferred component in two equal portions over the following two financial years (deferred STI 1 and 2). The ultimate amount of the deferred STI depended on the target achievement attained in respect of the two key performance indicators at group level (EBIT adjusted and free cash flow) in the respective financial years prior to the payment of the deferred STI. In exceptional cases, a bonus or malus determined at the discretion of the Supervisory Board of up to 20% for a given financial year would also have applied in line with GCGC guidelines.

In accordance with the original commitment, the remaining deferred STI components for 2015 will continue to run until 2018. Accordingly, in addition to the STI allocated and granted for the respective year, the tables showing the compensation of the Executive Board members for the financial years 2017 and 2016 also shows deferred STI entitlements and allocations relating to prior periods. In the financial year 2017, former Executive Board member Dr. Stefan Weingartner was paid his deferred STI entitlement for 2015 (deferred STI 2) amounting to € 22,360 based on a goal achievement level of 100%.

Performance Share Plan (PSP)

Until the financial year 2015, the members of the Executive Board received virtual shares under the Performance Share Plan (PSP) entitling them to receive a share-based payment at the end of a four-year assessment period that reflected the relative performance of the MTU share compared with the other shares in the MDAX index, based on total shareholder return (TSR).

The benefits arising from the PSP entitled the recipients to a payment in cash. The amount disbursed for each PSP tranche equaled the actual number of virtual shares (granted on the basis of the total shareholder return performance of the MTU share relative to that of all other MDAX-listed shares during the performance period) multiplied by the average MTU Aero Engines AG share price (XETRA) over the last 30 trading days prior to the end of the performance period. Accordingly, in 2016 a scheduled payment was made in respect of the PSP tranche granted in 2012 (PSP 2012). Subsequent PSP tranches were cashed out, as described below.

Share Matching Plan (SMP)
The members of the Executive Board were entitled until the financial year 2015 to use the post-tax benefits payable under each tranche of the Performance Share Plan (PSP) to purchase MTU Aero Engines AG shares subject to disposal restrictions. At the end of the three-year vesting period, these shares were matched on the basis of the Share Matching Plan (SMP), with each Executive Board member being awarded one additional free share for every three MTU shares acquired in this way.

Settlement of entitlements under the Performance Share Plan (PSP) and Share Matching Plan (SMP)
In view of the need to make the new compensation system for members of the Executive Board as of the financial year 2016 as efficient as possible, the entitlements under the Performance Share Plan (PSP) and the Share Matching Plan (SMP) granted to active members of the Executive Board up until December 31, 2015, but not yet exercisable, were converted into MTU shares subject to disposal restrictions with a vesting period of two years.

In respect of this conversion, MTU granted each of the Executive Board members a one-time cash settlement corresponding to the fair value of the entitlements to be converted under the PSP and the SMP as at December 31, 2015, with the obligation of immediately and fully converting the net proceeds (after tax) into MTU shares with a vesting period of two years (ends on April 30, 2018). Under this scheme, the members of the Executive Board acquired a total of 21,639 MTU shares at a price (XETRA) of € 82.87 per share (Reiner Winkler 9,385 shares, Dr. Rainer Martens 6,954 shares and Michael Schreyögg 5,300 shares).

Former Executive Board member Dr. Stefan Weingartner retained his right to 1,506 free shares for the MTU shares subject to disposal restrictions he purchased in 2014 under the terms of the Share Matching Plan (SMP). Instead of matching shares, he received a cash settlement at the end of the three-year vesting period in 2017 in the amount of € 198,340.

Rules when terminating the contracts of members of the Executive Board

The members of the Executive Board are insured under a defined benefit plan. The benefits payable to members of the Executive Board under this plan correspond to those of their peers in comparable companies.

Retirement and survivors' pensions

The members of the Executive Board earn company pension entitlements in accordance with the "MTU Pension Capital" plan, which constitutes the current post-employment benefits plan for members of the Executive Board of MTU Aero Engines AG. The goal of the plan is to provide a pension amounting to 60% of each member's basic salary after 15 years of service on the Executive Board. When this plan was introduced on January 1, 2010, the vested benefits that each member of the Executive Board had earned up until December 31, 2009 under the previous plan were transferred to the new plan in the form of initial units. This entitlement represents the benefit payable at age 60 under the old plan, adapted to reflect the ratio between the actual number of years of service with the company and the number of years from start of service with the company until age 60. The initial units transferred to the new plan correspond to the current cash value of the pension converted into a lump sum.

Contribution period capped at 15 years of service

Once this amount had been determined, a pension account was opened for each member of the Executive Board to which further capital units are credited annually. The annual capital units are calculated on the basis of an individual contribution and an age-dependent factor, with the latter taking into account an interest rate of 6 % per annum up to the age of 60. The contribution period is as a rule capped at 15 years of service on the Executive Board, or at age 60, whichever comes first. As of the age of 61, the pension account earns interest at an annual rate of 4 % until such time as the pension is drawn (= bonus amount). The accrued capital units plus the units initially transferred to the account plus any bonus amounts credited to the account together make up the pension capital available to finance post-employment benefits. If a member of the Executive Board dies before reaching age 60, 50 % of the benefits that he/she would otherwise have earned up to that age are added to the accrued balance on the pension account – taking into account the permissible contribution period.

As a general rule, the pension capital is paid as a single lump sum. However, at the request of the Executive Board member and subject to the company's approval, the pension capital may be drawn either in ten installments (with the amassed pension capital being increased by 4 % before payment of the installments) or as a lifelong pension with annual increments of 1 %. In any insured event, the pension account is topped up to the level of benefits the insured party would have reached under the previous plan (guaranteed capital). Pension benefits do not become payable until such time as an insured event occurs (i.e. on reaching pensionable age, or in the event of disability or death), even if the insured party leaves the Executive Board. The pension entitlement cannot be forfeited once the initial contribution has been paid.

Reiner Winkler and Dr. Rainer Martens had already been promised under the previous pension plan that their years of service with former group companies would count toward their pensions.

Details of the above-mentioned obligations and benefits are shown in the following table:

Existing post-employment benefit entitlements

Executive Board members in €	Initial transfer amount [1]	Guaranteed capital [2]	Annual contribution	End of contribution period	One-time payment
Reiner Winkler [3]	1,625,140	2,510,788	400,000	1.10.2019	7,744,205
Dr. Rainer Martens [4]	1,366,176	2,317,650	220,000	1.4.2018	4,517,676
Michael Schreyögg	365,627	365,627	215,478	1.8.2026	4,801,945

[1] Credit for past service up to December 31, 2009 (date of changeover to new system). Michael Schreyögg: Changeover date July 1, 2013.

[2] Level of benefits to which the insured party would have been entitled under the previous pension plan.

[3] Reiner Winkler was promised a special transfer amount of € 575,065 in 2010 in connection with the changeover of his pension entitlements to the new system.

[4] On October 24, 2017, an agreement was made with Dr. Rainer Martens to pay his pension entitlements as a lifelong pension.

Differentiated contributions to individual pension accounts

The differences in the annual contributions to the MTU pension accounts result from the remaining periods of service on the Executive Board until the end of the respective contribution period, from the respective age-dependent factors, and from the different salary amounts eligible for pension contributions.

The following table shows the service cost for the financial years 2017 and 2016, and the corresponding carrying amounts of pension provisions recognized for members of the Executive Board in accordance with both IFRS and the German Commercial Code (HGB):

Allocations to pension provisions and total amounts recognized

Executive Board members in €	Year	Service cost (IFRS)	Service cost (HGB)	Carrying amount of pension provisions at Dec. 31 (IFRS)	Carrying amount of pension provisions at Dec. 31 (HGB)
Reiner Winkler	**2017**	**225,211**	**200,390**	**6,694,772**	**6,093,190**
	2016	215,398	195,610	6,447,991	5,606,825
Dr. Rainer Martens	**2017**	**189,235**	**172,639**	**8,184,370**	**5,728,716**
	2016	181,990	168,116	4,786,287	4,220,570
Michael Schreyögg	**2017**	**116,834**	**92,286**	**3,348,230**	**2,766,611**
	2016	107,825	90,264	3,241,263	2,502,890
Total	**2017**	**531,280**	**465,315**	**18,227,372**	**14,588,517**
Total	**2016**	**505,213**	**453,990**	**14,475,541**	**12,330,285**

The pension obligations toward former members of the Executive Board in accordance with International Accounting Standards (DBO) amounted to € 7,968,694 (2016: € 8,039,606).

Disability pensions

Under the new pension rules of January 1, 2010, if a member of the Executive Board is disabled before reaching the age of 60, 50% of the benefits to which he/she would normally have been entitled up to the maximum age limit are added to the balance on the pension account at the time of disablement. The amount credited is based on the contributions paid in the last year of employment. This arrangement also applies if the insured party dies before reaching the age of 60.

Severance payments on premature termination of contracts for members of the Executive Board

Capped severance payments

Members of the Executive Board are entitled to receive a severance payment if MTU prematurely terminates their employment contract. This severance package comprises pro-rata amounts of the board member's basic salary, STI entitlement and Restricted Stock Plan (RSP) benefits covering the period up to the date on which his contract would normally have expired. The total amount of the severance payment is capped at twice the departing board member's total annual compensation. If the employment contract is terminated by MTU for cause, no severance package is payable. In such cases, MTU also has the right to demand repayment of the tranche of RSP shares granted in the financial year in which the contract was terminated (claw-back). No other claw-back regulations are applied because the German Stock Corporation Act (Section 93 AktG) already provides for damage claims against members of the Executive Board who violate their duties.

Severance payments on premature termination of contracts for members of the Executive Board in the event of a change of control or substantial changes in the ownership of MTU Aero Engines AG

In accordance with the contracts for members of the Executive Board in force as of January 1, 2016, a change of control is deemed to have occurred if, pursuant to Section 22 of the German Securities Trading Act (WpHG), a shareholder directly or indirectly acquires a majority of the voting rights and this results in significant disadvantages for members of the Executive Board. Significant disadvantages exist in particular if the member of the Executive Board is dismissed, his duties and responsibilities significantly change or if the Executive Board member is asked to agree to a reduction in salary or premature termination of his contract. In such cases, Executive Board members are accorded special rights of termination, which must be exercised within six months, with three months' notice to the end of the month. If a member of the Executive Board makes use of these special termination rights, or if the Executive Board member's contract is terminated by mutual agreement within nine months of the change of control, the board member is entitled to a severance package comprising all outstanding compensation components covering the period up to the date on which his contract would normally have expired. When calculating the amount of the severance payment, a target achievement level of 100 % is assumed for the variable compensation components. The maximum amount of the severance payment is capped at three times the total annual compensation.

Supervisory Board compensation

Compensation in line with the size of the company

The rules governing Supervisory Board compensation are laid down in the articles of association of MTU Aero Engines AG. Such compensation is established relative to the size of the company and the duties and responsibilities of the respective members.

Pursuant to Article 12 of the articles of association of MTU Aero Engines AG, members of the Supervisory Board receive a fixed annual payment of € 50,000, payable at the end of the financial year. This sum is tripled in the case of the chair of the Supervisory Board and multiplied by one and a half in the case of the deputy chair. In addition to the fixed annual payment, members serving on one of the Supervisory Board's committees receive an additional € 10,000 and a further € 20,000 if they chair a committee. Further, members of the Supervisory Board receive an attendance fee of € 3,000 for each meeting of the Supervisory Board and its committees, subject to an upper limit of € 3,000 per day. The attendance fee is halved for meetings convened by the chair or deputy chair that take place via telephone or video conference. Expenses incurred in connection with the exercise of their office are reimbursed, as is the value-added tax payable on the fees.

The members of the Supervisory Board do not receive any share-based compensation.

The following compensation was awarded to the individual members of the Supervisory Board of MTU Aero Engines AG for the financial years 2017 and 2016 respectively.

Supervisory Board compensation

in €	2017[1]				2016[1]			
Supervisory Board member	Fixed annual payment	Committee member fees	Attendance fees	**Total compensation**	Fixed annual payment	Committee member fees	Attendance fees	Total compensation
Klaus Eberhardt (Supervisory Board and Personnel Committee chairman) [3] [4]	150,000.00	50,000.00	27,000.00	227,000.00	150,000.00	50,000.00	24,000.00	224,000.00
Josef Mailer (Supervisory Board deputy chairman) [2] [3] [5]	75,000.00	20,000.00	24,000.00	119,000.00	75,000.00	20,000.00	24,000.00	119,000.00
Dr. Joachim Rauhut (Audit Committee chairman)	50,000.00	30,000.00	24,000.00	104,000.00	50,000.00	30,000.00	24,000.00	104,000.00
Thomas Bauer	50,000.00		15,000.00	65,000.00	50,000.00		15,000.00	65,000.00
Michael Behé [5]	50,000.00		15,000.00	65,000.00	50,000.00		15,000.00	65,000.00
Dr. Wilhelm Bender	50,000.00		15,000.00	65,000.00	50,000.00		15,000.00	65,000.00
Thomas Dautl	50,000.00		15,000.00	65,000.00	50,000.00		15,000.00	65,000.00
Babette Fröhlich (until April 14, 2016) [3] [5]				0.00	14,444.44	2,888.89	9,000.00	26,333.33
Dr.-Ing. Jürgen M. Geißinger [2] [4]	50,000.00	20,000.00	15,000.00	85,000.00	50,000.00	20,000.00	15,000.00	85,000.00
Dr. Martin Kimmich [2] [5]	50,000.00	10,000.00	15,000.00	75,000.00	50,000.00	10,000.00	15,000.00	75,000.00
Heike Mandan (since April 15, 2016) [3] [5]	50,000.00	10,000.00	24,000.00	84,000.00	35,555.56	7,111.11	12,000.00	54,666.67
Prof. Dr.-Ing. Klaus Steffens	50,000.00		15,000.00	65,000.00	50,000.00		15,000.00	65,000.00
Prof. Dr. Marion A. Weissenberger-Eibl	50,000.00		15,000.00	65,000.00	50,000.00		15,000.00	65,000.00
Total	**725,000.00**	**140,000.00**	**219,000.00**	**1,084,000.00**	**725,000.00**	**140,000.00**	**213,000.00**	**1,078,000.00**

[1] Amounts do not include VAT.

[2] Member of the Personnel Committee.

[3] Member of the Audit Committee.

[4] Member of the Nomination Committee.

[5] These employee representatives have declared that they will donate their Supervisory Board compensation to the Hans-Böckler-Stiftung, in accordance with the guidelines of the Confederation of German Trade Unions.

Seville

Spain

A military transporter comes together: final assembly of the A400M in Seville

Seville
Spain

A military transporter comes together: final assembly of the A400M in Seville

BACKGROUND INFORMATION

A400M

A400M
The A400M military transporter has an empty weight of around 79 metric tons and a 340-cubic-meter cargo capacity. The maximum take-off weight is 141 metric tons.

TP400-D6 engine
- Weight: 1,900 kilograms
- Length: 3.5 meters
- Propeller diameter: 5.33 meters

MTU is responsible for the final assembly and production acceptance testing of all TP400-D6 production engines.

A400M 100-day project

It's 11 a.m. and under the Andalusian sun a convoy of trucks carrying MTU-assembled TP400-D6 engines for the A400M military transporter is rolling toward Seville. Their journey will take them to Airbus Defense and Space, where the military transporter undergoes final assembly. It takes around 100 days to complete the assembly of an A400M aircraft, with eight days earmarked for mounting the four engines and the propellers.

European partnership for the engines

The TP400-D6, the most powerful turboprop engine in the Western world, is developed by MTU in collaboration with its partners ITP, Rolls-Royce and Safran Aircraft Engines. A special feature

The A400M military transporter on the runway. With an output of 8,200 kW, its TP400-D6 engines are the most powerful turboprops in the Western world.

of MTU's workshare is that the company is responsible for the final assembly and acceptance testing of all TP400-D6 production engines–on the world's only test cell qualified to test this engine, which is installed at MTU Maintenance Berlin-Brandenburg in Ludwigsfelde.

Engine maintenance assured

After the A400M has left the final assembly line in Seville, in-house inspections and test flights are the order of the day before the aircraft is ready for acceptance by the customer. The end of September 2017 marked delivery of the 50th A400M–to the German armed forces. Over the next five years, MTU Aero Engines will support all engines powering Germany's A400M military transport aircraft. The corresponding maintenance framework agreement was concluded between the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) and MTU in October 2017.

MTU is responsible for dismantling the engines into their individual modules and accessories and delivering them to the respective manufacturer for maintenance. After the components have been overhauled, MTU is once again in charge of re-assembling the TP400-D engines and acceptance testing.

BACKGROUND INFORMATION

Military engine programs in which MTU holds a significant share

A400M/TP400-D6: MTU is responsible for the intermediate-pressure compressor, the intermediate-pressure turbine and shaft and parts of the control system for the TP400-D6. The company also carries out final assembly and acceptance testing of all TP400-D6 production engines.

T408/Sikorsky CH-53K: For the T408, MTU develops and manufactures the power turbine. In addition, MTU will obtain licenses for the maintenance, final assembly and testing of the T408 models for a future European heavy-duty transport helicopter.

EJ200/Eurofighter: MTU's workshare in the EJ200 program includes the manufacture of the low- and high-pressure compressors, the electronic control system, parts of the high-pressure turbine, and assembly and testing of the engines destined for service in Germany.

Report of the Supervisory Board

Klaus Eberhardt / Chairman of the Supervisory Board

Activities of the Supervisory Board

In this report, the Supervisory Board provides information in accordance with Section 171 (2) of the German Stock Corporation Act (AktG) on its activities in the financial year 2017 and on the results of its review of the annual financial statements and consolidated financial statements. In 2017, the Supervisory Board carried out with due care the control and consultation duties with which it is entrusted by law and under the terms of the company's articles of association and its own rules of procedure.

The Supervisory Board regularly advised the Executive Board on the running of the company, continually supported and monitored all executive business activities, and assured itself that the Executive Board's dealings were proper and lawful. The Supervisory Board was informed and consulted in a direct and timely manner on all decisions of consequence for the company. The members of the Supervisory Board were briefed by the Executive Board in a regular, timely and comprehensive manner on the situation of the company, and received written reports every month on the company's earnings, financial situation and net asset position as well as on important business transactions. The Supervisory Board was also informed in detail of any new plans.

The Supervisory Board met with the Executive Board to discuss strategy issues and all major projects. After careful deliberation and examination, the Supervisory Board endorsed the strategic orientation of the company. The Supervisory Board passed resolutions on all transactions for which its approval is required in accordance with law, the company's articles of association or the Executive Board's rules of procedure after reviewing and discussing them with the Executive Board.

As in previous years, the Supervisory Board devoted special attention to MTU's system of internal controls in 2017, above all the company's risk management system, its auditing practices and the conformity of its corporate governance system with the relevant legal provisions. The Supervisory Board examined these aspects with reference to the documents submitted to it and in dialog with the Executive Board, coming to the conclusion that the company has effective systems in place, in particular an effective internal control and risk management system in relation to the accounting process.

The Supervisory Board's compliance monitoring activities are supplemented by those of the Audit Committee, which has a special responsibility in this respect. The internal auditors regularly present their findings to the Audit Committee and report to it on the latest developments in the field of compliance.

Meetings of the Supervisory Board

During the financial year 2017, the Supervisory Board convened five ordinary meetings. No telephone conferences were held. All Supervisory Board members attended at least half of the meetings of the Supervisory Board and of the committees of which they are members. The attendance rate was 96.7%. Between official meetings, the chairman of the Supervisory Board was regularly briefed on the company's current situation, significant business transactions and important pending decisions. This entailed regular meetings with the Executive Board, consulting with the latter on strategy, the status of planning, the progress of business, the company's risk situation and system of risk management as well as compliance.

At its meetings, the Supervisory Board discussed the business performance of MTU and all its affiliated companies with the Executive Board. The Supervisory Board thoroughly reviewed the allocation of the group's net profit for the financial year 2016, and approved the Executive Board's profit distribution proposal. Accordingly, a dividend payment of € 1.90 per entitled share was proposed to the Annual General Meeting.

A further question dealt with by the Supervisory Board concerned the appointment of an external auditor. Following the recommendation of the Audit Committee, the Supervisory Board proposed that Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, Munich, should be appointed to audit the financial statements and consolidated financial statements and to review the half-yearly financial reports for the financial year 2017. The Annual General Meeting approved this proposal by a majority of 99.95%.

At its meetings, the Supervisory Board also discussed the status of new engine programs in which MTU holds a stake, such as those for the PW1000G engine family, the PW800 and the GE9X, including the entry into service of the Boeing 777X, which is planned for 2019. Another topic discussed at length was the outlook for MTU's MRO business.

The Supervisory Board moreover accepted the request by Dr. Rainer Martens to retire from his post as Chief Operating Officer with effect of December 31, 2017. His successor as Chief Operating Officer, appointed by the Supervisory Board for a term of three years, is Lars Wagner. The Supervisory Board also appointed Peter Kameritsch as the group's new Chief Financial Officer and Chief Information Officer, for a term of three years. These two appointments were accompanied by a reorganization of Executive Board functions, placing Wagner in charge of operations management and giving Kameritsch responsibility for financial affairs and IT management.

The representation of women on the Executive Board was another subject dealt with by the Supervisory Board. In accordance with the latest versions of the German Stock Corporation Act (AktG) and the German Corporate Governance Code (GCGC), the Supervisory Board fixed a target quota of 25% to be achieved by 2022.

Other issues closely examined by the Supervisory Board were the operational business plans and the budget for 2018, the amount of the short-term incentive (STI) payable to the members of the Executive Board for the financial year 2016, definition of the targets and bandwidths for the award of STI payments to Executive Board members for 2017, and compliance with the German Corporate Governance Code.

Corporate governance

The Supervisory Board is convinced that the success of the company is based on good corporate governance. For this reason, the Supervisory Board closely studied the application and implementation of the German Corporate Governance Code in 2017, taking it as a yardstick to measure the efficiency of its own activities. It analyzed the diversity of its own composition, especially with regard to the fair representation of women.

In addition, the Supervisory Board explicitly stated that, in the nomination proposals it makes to the Annual General Meeting, it takes into account the principles concerning the avoidance of conflicts of interest and will continue to do so. In submitting nomination proposals, the Supervisory Board will disclose any personal ties or business relations the candidates may have with the company, its governing bodies and/or major shareholders. No nominations were proposed in 2017.

The Supervisory Board deems all of its members to be independent; this expressly applies to the employee representatives and likewise to Prof. Dr. Steffens, who ceased to be a member of MTU's executive management a considerable time ago, in 2004. Consequently, all Supervisory Board committees also consist exclusively of independent members. The members of the Supervisory Board take part in training measures on their own responsibility, and also receive specialized training from MTU. Cooperation between the Supervisory Board and the Executive Board, and among the members of the Supervisory Board, was judged to be of a very high quality in the financial year 2017. No conflicts of interest arose between MTU and any member of its Executive Board or Supervisory Board.

In a joint declaration with the Executive Board dated December 11, 2017, pursuant to the requirements of Section 161 of the German Stock Corporation Act (AktG), the Supervisory Board states

that MTU Aero Engines AG complies with all the recommendations of the German Corporate Governance Code. The company's declaration is reproduced on page 22 of this Annual Report together with a more detailed description of the company's corporate governance system; the declaration has also been posted on the company's website.

Committee meetings

By convention, the Supervisory Board has three committees equally representing the employees and the shareholders of the company: the Audit, the Personnel and the Mediation Committee – the latter formed to comply with Section 27 (3) of the German Co-Determination Act (MitbG). Each of these committees presents regular reports on its activities at the plenary meetings of the Supervisory Board.

A Nomination Committee, which meets on an ad hoc basis, was set up in 2007 pursuant to the recommendations of the German Corporate Governance Code. The Nomination Committee convened once in the financial year 2017. The task of the Nomination Committee is to find suitable candidates for election to the Supervisory Board. The members of this committee are Klaus Eberhardt (chair) and Dr. Jürgen M. Geißinger.

The Personnel Committee, which among other things deals with Executive Board employment contracts, including compensation and the recommendation of candidates, comprises Klaus Eberhardt (chair), Dr. Jürgen M. Geißinger and the two employee representatives Josef Mailer and Dr. Martin Kimmich. The Personnel Committee convened three times in 2017, discussing among other things the amount of the short-term incentive (STI) payable to members of the Executive Board for the financial year 2016, definition of the goals for the STI payments for 2017, the Supervisory Board's efficiency audit, and recommendations to the Supervisory Board concerning the appointment of the two new Executive Board members, Peter Kameritsch and Lars Wagner, and their compensation. This committee's attendance rate was 92%.

The Mediation Committee, whose members are identical with those of the Personnel Committee, did not have to convene in 2017.

The members of the Audit Committee are Dr. Joachim Rauhut (chair), Klaus Eberhardt, Josef Mailer and Heike Madan. The Audit Committee convened six times in 2017 with an attendance rate of 100%. It focused on reviewing the annual financial statements, the consolidated financial statements and the combined management report of the MTU group and MTU Aero Engines AG as well as the company's financial situation and the annual and half-year reports and quarterly statements.

Further, the Audit Committee discussed the additional services provided by the auditors, and the granting of the audit mandate. The Audit Committee specified the key areas for the audit of the 2017 annual financial statements and concluded the audit contract with Ernst & Young Wirtschaftsprüfungsgesellschaft. In addition, the committee obtained the auditor's statement of independence pursuant to Section 7.2.1 of the German Corporate Governance Code and also monitored the auditor's independence. Rules were additionally established for the provision of non-audit services by the auditors and a cap imposed on the fees for such services.

To aid the committee members in their tasks, they and all other members of the Supervisory Board were supplied with copies of the reports prepared by Ernst & Young concerning the auditing of the annual financial statements and consolidated financial statements as well as the combined management report. These documents were thoroughly reviewed in the presence of Ernst & Young. As a result, the committee recommended that the Supervisory Board should adopt the financial statements, approve the combined management report and consent to the Executive Board's profit distribution proposal.

In accordance with statutory requirements, the Audit Committee monitored the accounting process, the accounting-related internal control and risk management system and the internal auditing system, which it judged to be effective. It received regular reports on the company's compliance management. Other

items on the agenda of its meetings were the efficiency audit carried out by the Audit Committee, the effects of applying the amended version of the IFRS 15 international reporting standard, the elaboration of new rules governing CSR reporting practices in the form of a non-financial statement, and the provision of non-audit services by Ernst & Young.

Adoption of the annual financial statements, the approved consolidated financial statements and the management report

The annual financial statements, consolidated financial statements and combined management report of the MTU group and MTU Aero Engines AG for the financial year 2017 were audited and fully certified by the accounting firm Ernst & Young, Munich, whose appointment had been confirmed by the 2017 Annual General Meeting. The audit opinion was signed by Siegfried Keller and Markus Westermeier, who have audited MTU since 2014. MTU awards auditing contracts for a duration of one year only. A proposal to reappoint Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, Munich, for a fifth year will be presented to the 2018 Annual General Meeting for approval. The audit reports and documents to be reviewed were submitted in a timely manner to all members of the Supervisory Board. The Supervisory Board thoroughly reviewed the annual financial statements, consolidated financial statements and the combined management report including non-financial statement of the MTU group and MTU Aero Engines AG for 2017 and the Executive Board's profit distribution proposal on the basis of Ernst & Young's audit, on which the chair of the Audit Committee had presented a full report to the Supervisory Board.

The auditor attended the meetings of the Audit Committee of MTU Aero Engines AG on January 25, 2018 and February 20, 2018, and the balance sheet meeting of the Supervisory Board on February 27, 2018, and presented the main findings of the audit. The Supervisory Board reviewed the annual financial statements, consolidated financial statements, combined management report (including non-financial statement) and the Executive Board's profit distribution proposal, and raised no objections. The company's annual financial statements and consolidated financial statements for the financial year 2017 as submitted by the Executive Board were approved at the Supervisory Board meeting on February 27, 2018. The annual financial statements are thereby adopted. The Supervisory Board agreed to the Executive Board's profit distribution proposal after giving due consideration to the interests of the company and its shareholders. Accordingly, a proposal was submitted to the Annual General Meeting that a dividend of € 2.30 per entitled share be distributed for the 2017 financial year.

Boardroom changes

As of January 1, 2018, the Executive Board has two new members: Peter Kameritsch as Chief Financial Officer and Chief Information Officer, and Lars Wagner as Chief Operating Officer. The former Chief Operating Officer, Dr. Rainer Martens, relinquished his post at his own request with effect from December 31, 2017. The Supervisory Board would like to thank Dr. Rainer Martens for his long years of dedicated, professional service as a member of the MTU Executive Board. The Supervisory Board also thanks the entire Executive Board for its close and constructive cooperation as well as all MTU employees for their successful work and the great commitment they showed in 2017. It is also grateful to the Works Council for its close cooperation and to all MTU's shareholders for the trust they place in the company.

Munich, February 27, 2018

Klaus Eberhardt
Chairman of the Supervisory Board

The Supervisory Board

Members of the MTU Supervisory Board and the additional mandates they hold on the supervisory board or a comparable controlling body of other business enterprises in Germany or abroad

Klaus Eberhardt
Chairman of the Supervisory Board
Independent Consultant
Former CEO of Rheinmetall AG, Düsseldorf

Dürr AG (until December 31, 2017)
ElringKlinger AG

Josef Mailer
Deputy Chairman of the Supervisory Board
Chairman of the Group Works Council of MTU Aero Engines AG, Munich
Chairman of the Works Council of MTU Aero Engines AG, Munich

Thomas Bauer
Full-time member of the Works Council of MTU Aero Engines AG, Munich

Michael Behé
Full-time member of the Works Council of MTU Maintenance Hannover GmbH, Hannover
Member of the Group Works Council of MTU Aero Engines AG, Munich

MTU Maintenance Hannover GmbH

Prof. Dr. Wilhelm Bender
Independent Consultant
Former CEO of Fraport AG, Frankfurt/Main

FrankfurtRheinMain GmbH
International Marketing of the Region
Joint Stock Company “National Company”
Kazakhstan Temir Zholy
The Germany Funds:
- The Central Europe, Russia and Turkey Fund, Inc. (U.S.)
- The European Equity Fund, Inc. (U.S.)
- The New Germany Fund, Inc. (U.S.)

Thomas Dautl
Director Manufacturing Technology, MTU Aero Engines AG, Munich

Dr.-Ing. Jürgen M. Geißinger
CEO of Senvion SA, Luxembourg
Hilotherm Holding AG (Switzerland)
Sandvik AB (Sweden) (until April 24, 2017)

Dr. Martin Kimmich
Second authorized representative of IG Metall, Munich

Linde AG
Nokia Solutions and Networks Management GmbH

Heike Madan
Trade union company policy department, union workplace representatives and company policy division, IG Metall, Frankfurt/Main

Dr. Joachim Rauhut
Independent Consultant
Former Member of the Executive Board of Wacker Chemie AG, Munich

B. Braun Melsungen AG
J. Heinrich Kramer Holding GmbH
Stabilus S.A.

Prof. Dr.-Ing. Klaus Steffens
Independent Consultant

Former President and CEO of MTU Aero Engines GmbH, Munich

Poppe & Potthoff GmbH

Prof. Dr. Marion A. Weissenberger-Eibl
Director of the Fraunhofer Institute for Systems and Innovation Research ISI in Karlsruhe and holder of the Chair of Innovation and Technology Management at the Karlsruhe Institute of Technology

HeidelbergCement AG
Rheinmetall AG

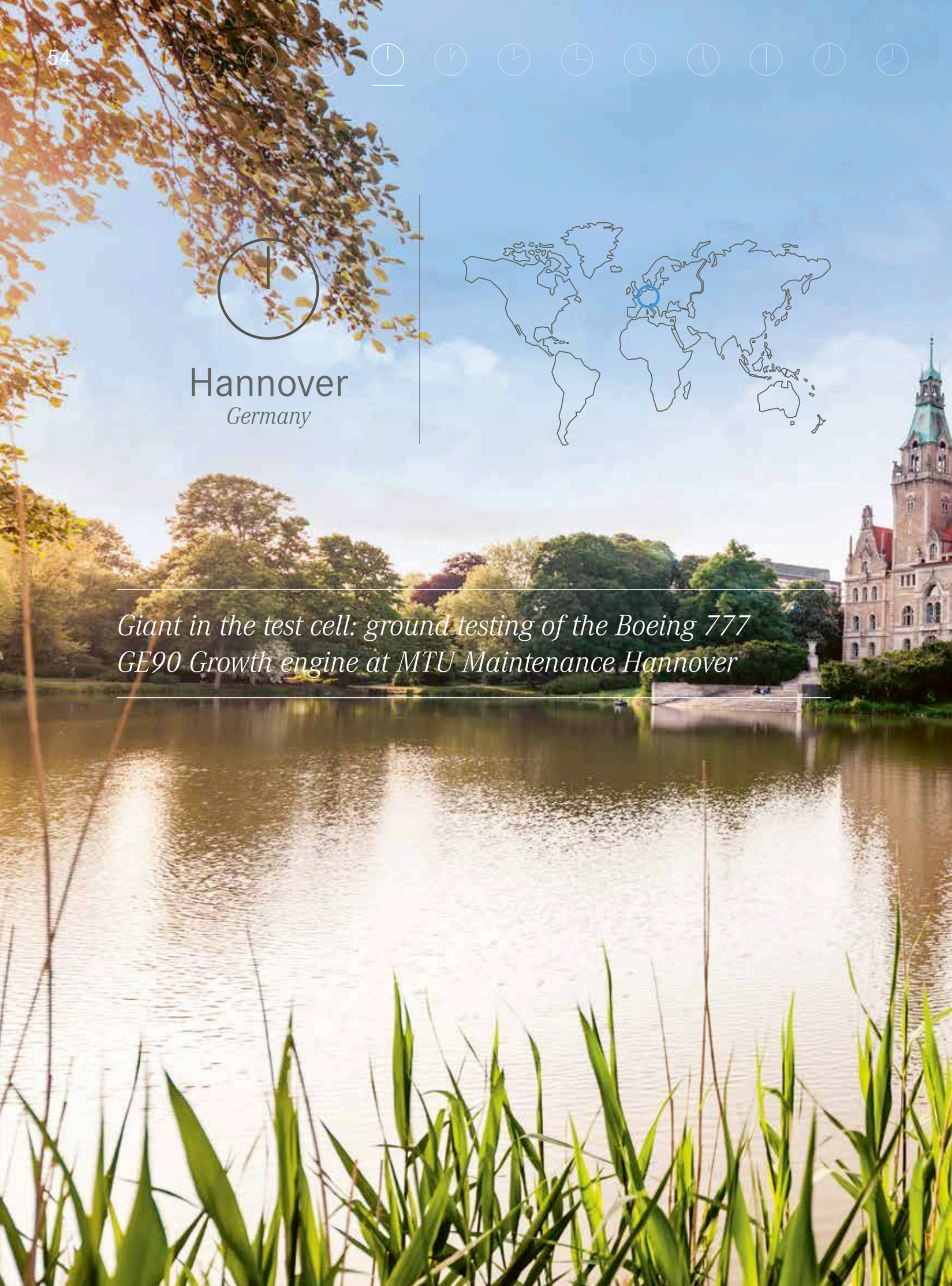
SUPERVISORY BOARD COMMITTEES

Personnel Committee
Klaus Eberhardt, Chairman
Dr.-Ing. Jürgen M. Geißinger
Dr. Martin Kimmich
Josef Mailer

Audit Committee
Dr. Joachim Rauhut, Chairman
Klaus Eberhardt
Heike Madan
Josef Mailer

Mediation Committee
Klaus Eberhardt, Chairman
Dr.-Ing. Jürgen M. Geißinger
Dr. Martin Kimmich
Josef Mailer

Nomination Committee
Klaus Eberhardt, Chairman
Dr.-Ing. Jürgen M. Geißinger



Hannover

Germany

Giant in the test cell: ground testing of the Boeing 777 GE90 Growth engine at MTU Maintenance Hannover

Hannover
Germany

Giant in the test cell: ground testing of the Boeing 777 GE90 Growth engine at MTU Maintenance Hannover

GE90 GROWTH

The GE90 Growth is the world's biggest and most powerful engine. The designation Growth is used in reference to the GE90-110B and -115B engines.

The two GE90 Growth versions are the exclusive powerplants for Boeing's latest additions to its 777 family of aircraft: the 777-200LR, the -300ER and the -200F.

Putting engines through their paces

The midday bells ring out on Hannover's Marktkirche (market church). Around ten kilometers further north, at MTU Maintenance Hannover in Langenhagen, a GE90-115B is being rigged up in the test cell. This is the world's biggest and most powerful engine. MTU's technicians hook up the multicoupling system, which allows the engine measuring points and test cell measurement system to be connected with a single click. At the same time, they connect the control and supply lines. In the next step, the bolts of the engine mounting are passed through the openings

MTU Maintenance Hannover is one of the first MRO shops worldwide licensed to repair and undertake major overhauls of the GE90 Growth.

Tested and found good: packed engines awaiting delivery to the customer.

A freshly overhauled GE90 Growth engine must undergo an acceptance test run–in line with the scope of the shop visit. There are two test cells at the Hannover location: with a thrust range up to 100,000 pounds and 150,000 pounds, respectively.

in the thrust measuring bridge. MTU's staff work fast and fully focused. While testing gets underway in the test cell, the technicians in the rigging center are getting the next engine ready. And next door, they are packing up the engine that has just come off the test cell.

During the test run, the GE90-115B is put through its paces. "We adapt the acceptance test run for each engine to the scope of the shop visit," explains Thomas Michaelis, senior manager, engine testing. In the control center, the technicians push the thrust lever and run the engine at full load. A 115,000-pound thrust is brought to bear on the test cell. The airflow rate is more than 1.5 metric tons per second. A dozen monitors display all relevant information, graphically enhanced and collated in real time: exhaust temperature, airflow, generated thrust and fuel consumption. A test run takes around ten hours. However, if refinements are required, it can sometimes take considerably longer.

The GE90 Growth has been part of MTU Maintenance Hannover's portfolio for more than seven years; Hannover is one of the first maintenance shops worldwide to obtain a license for the repair and complete overhaul of this engine family.

Equipped for the future

Engine programs for wide-body jets, including the GE90 Growth, meanwhile account for around one third of all engine overhauls carried out by MTU Maintenance Hannover. The test engineers in Lower Saxony are also equipped to handle the next generation of engines, not least in terms of test cell capacity: "That will pay off when we'll have to start accommodating the GE9X for the Boeing 777X in our maintenance facilities in a few years' time," Michaelis says.

BACKGROUND INFORMATION

Global network of test facilities

Munich
Test cells for development, for components and production acceptance test cells for fully assembled commercial and military engines.

Ludwigsfelde
Test cells for industrial gas turbines, turboshaft and jet engines.

Zhuhai
Test cells for V2500 engines and the -3, -5 and -7 variants of the CFM56.

Vancouver
Test cells for actuators, fuel pumps and fuel measuring instruments.

Combined management report

The enterprise MTU

Business environment

MTU AG (disclosures in accordance with The German Commercial Code (HGB))

Forecasts

Risk and opportunity report

The internal control and risk management system in relation to the group accounting process

Disclosures in connection with the takeover directive

Other disclosures

Combined management report

The management report of MTU Aero Engines AG and the group management report for the financial year 2017 have been combined in accordance with Section 315 (5) in conjunction with Section 298 (2) of the German Commercial Code (HGB).

The enterprise MTU

Business activities and markets

Germany's leading engine manufacturer

MTU Aero Engines AG, Munich, together with its consolidated group of companies, is Germany's leading engine manufacturer and one of the biggest international players in the industry. In the following, the MTU group is also referred to simply as MTU AG, MTU, or the group.

MTU's portfolio covers the entire lifecycle of commercial and military aircraft engines, and aero-derivative industrial gas turbines. The company's range of activities extends from development, manufacturing and marketing through to maintenance.

The company is a technological leader in low-pressure turbines, high-pressure compressors and turbine center frames as well as repair techniques and manufacturing processes. MTU is a key partner in all national and international technology programs of note, and cooperates with the top names in the industry – GE Aviation, Pratt & Whitney and Rolls-Royce.

The group is also one of the world's leading providers of MRO services for commercial aero engines. In the military sector, it has been the leading company in the national market and lead industrial partner to the German armed forces for many decades.

MTU divides its activities into two operating segments: OEM business (Original Equipment Manufacturing) and MRO business (Maintenance, Repair and Overhaul). The OEM segment covers new commercial engines, including spare parts, and the whole of the military sector. The MRO segment comprises all commercial maintenance activities.

Group structure, locations and organization

Through its affiliates, associated companies, joint ventures and equity investments, MTU has a strong presence in all key markets and regions worldwide. More information on equity investments is provided in Part I of the Notes to the consolidated financial statements (Accounting policies and principles).

→ further information on page 170

MTU Aero Engines worldwide

MTU Maintenance Canada

MTU Aero Engines North America

Vericor Power Systems

MTU Maintenance Dallas

MTU Aero Engines

MTU Maintenance Hannover

MTU Maintenance Berlin-Brandenburg

MTU Maintenance Lease Services

MTU Aero Engines Polska

AES Aerospace Embedded Solutions[1)]

Pratt & Whitney Canada Customer Service Centre Europe[1)]

Ceramic Coating Center[1)]

MTU Maintenance Zhuhai[1)]

Airfoil Services[1)]

[1)] Joint ventures.

Global MTU workforce

Number of employees	Dec. 31, 2017	Dec. 31, 2016	Change 2017 - 2016 Employees	in %
Locations in Germany	7,500	7,182	318	4.4
International locations	1,346	1,186	160	13.5
Total workforce	**8,846**	**8,368**	**478**	**5.7**

Corporate strategy

MTU's corporate strategy is geared to profitable growth and customer satisfaction. The four target areas of MTU's growth strategy are:

A balanced product portfolio – Participation in rapidly growing new programs

Participation in rapidly growing programs

MTU participates in rapidly growing and high-volume military and commercial engine applications, working with various partners in doing so. It optimizes its risk profile as well as growth opportunities through continuous participation in varying thrust classes and fields of application. MTU Aero Engines is currently focusing on ramping up production of Geared Turbofan™ engines for regional and medium-haul jets, which it has developed together with partners, and on developing GE's GE9X engine program for the Boeing 777X widebody aircraft, for which the market launch is scheduled for 2020. These programs complement MTU's excellent positioning in the MRO segment, as the company has secured itself a share in the future aftermarket service business through its stakes in these engine programs.

Cutting-edge technologies – Maintaining and expanding technological leadership

MTU is currently extending its technological leadership by focusing on the development of new high-temperature materials and modern manufacturing technologies such as additive processes. In combination with optimized cyclic processes, the company is thus able to achieve even greater efficiency in the medium term with its core modules – the high-pressure compressor, turbine center frame and low-pressure turbine – and therefore greater profitability and environmental friendliness, while simultaneously reducing component weight.

Concurrently, MTU is also cooperating with research institutes and industrial partners on assessing and demonstrating future engine concepts from the early development stages.

The digitalization of products, services and value creation processes is also growing in importance. This manifests itself in development, for instance, in the extensive use of simulation techniques in all areas through to the virtual engine.

Enhanced competitiveness – Increased productivity accompanied by a reduction in capital tie-up

MTU encourages a culture of continuous improvement in order to secure its competitiveness. The focus here is on optimizing structures, processes and capital tie-up in all areas of the company. Digitalization and automation technologies (Industry 4.0) play a key role here.

The goal is to continue to optimize MTU's supply chain and its production and service network in terms of delivery capability, quality and costs.

Innovative corporate culture – Motivated employees in a creative environment

Highly motivated, skilled workers are crucial to the successful growth of the MTU group. MTU's corporate culture places emphasis on personal development and achievement coupled with a strong sense of social responsibility.

The trend toward digitalization is set to change the work environment as we know it along with tried-and-tested management methods. More scope and greater responsibility for employees as well as short decision paths are key elements of an innovative corporate culture. All employees are encouraged and empowered to contribute their own ideas and translate them into new products, services and improvements.

The company promotes cultural and individual diversity as well as flexible working conditions and high-quality basic and further training opportunities for its workforce.

MTU is confident that long-term-oriented action, targeted investments and continuous development of the corporate culture will enable the company to achieve its strategic objectives.

Group internal control system

KPI-based management

MTU is managed with reference to the key performance indicators adopted by the Executive Board. These performance metrics are derived from the operational business plans and provide the underpinnings for a method of corporate management that is directed toward sustainable and profitable growth. An efficient planning and control system and an incentive-based management compensation system are in place to help bring about the decisions that create a suitable environment for implementing corporate strategy.

Performance indicators

			Change 2017 - 2016	
in € million	2017	2016	in € million	in %
Revenues	5,036.3	4,732.7	303.6	6.4
EBIT adjusted	606.6	503.0	103.6	20.6
EBIT adjusted margin (in %)	12.0	10.6		
Free cash flow	151.1	82.0	69.1	84.3

The value-driving key performance indicators EBIT, revenues and free cash flow delimit the range within which MTU operates in terms of profitability, growth and liquidity.

Please refer to the subsection "Reconciliation of adjusted performance indicators" in the section "Operating results" for a definition of EBIT adjusted, which is the most important of these KPIs. Another indicator monitored by the company is the EBIT adjusted margin, which expresses the relationship between EBIT adjusted and revenues.

→ further information on page 74

The purpose of optimizing cash flow is to help the group maintain its financial strength going forward. MTU determines its free cash flow by combining its cash flow from operating activities with its cash flow from investing activities. Because the latter includes certain components (non-recurring cash outflows) that lie outside the control of operations management and do not form part of the group's core activities, these components are excluded from the calculation of free cash flow. This adjustment concerns non-recurring cash outflows in the form of acquisition payments for shares in engine programs, payments in connection with interest-bearing loans related to financing agreements, and financial assets held for the purpose of liquidity management.

Free cash flow

			Change 2017 - 2016	
in € million	2017	2016	in € million	in %
Cash flow from operating activities	482.5	358.0	124.5	34.8
Cash flow from investing activities	–362.4	–314.0	–48.4	–15.4
Non-recurring cash outflows	31.0	38.0	–7.0	–18.4
Free cash flow	**151.1**	**82.0**	**69.1**	**84.3**

Research and development

Economic environment and goals

Strong technological leadership

An increasingly mobile society, diminishing natural resources and a rising awareness of the environment all call for innovative solutions – especially when it comes to aircraft engines. MTU has established technological leadership in its core competencies of low-pressure turbines, high-pressure compressors, turbine center frames, and high-tech manufacturing processes and repair techniques. This provides a solid basis for refining existing engines and developing entirely new ones.

MTU's medium- to long-term goals in the development of new commercial engines fully comply with the voluntary commitment made by the European aviation industry and research community, who formulated ambitious targets for air traffic in 2050 in their Strategic Research and Innovation Agenda (SRIA):

Long-term goals [1]

	SRIA 2020	SRIA 2035	SRIA 2050
CO_2 emissions - air traffic	–43%	–60%	–75%
CO_2 emissions - engines	–20%	–30%	–43%[2]
NOx emissions - mainly engines		–84%	–90%
Noise - mainly engines		–55%	–65%

[1] Changes compared with base year 2000, per passenger-kilometer
[2] Given comparable improvements in aircraft and engines

The main focus of MTU's R&D activities is to improve overall engine efficiency as a means of reducing both fuel consumption and emissions. This can be done by lowering the fan-compression ratios / increasing the bypass ratios, thereby improving thrust efficiency, increasing temperatures and overall pressure ratios to improve thermal efficiency, and enhancing component efficiency. What is more, in aviation reducing weight also significantly influences fuel consumption. Key

components in this respect are MTU's low-pressure turbine and high-pressure compressor, which feature high pressure ratios, low weight and high efficiency ratios, and the heavily loaded turbine center frame. Enhancing these technologies is an ongoing task for MTU.

MTU's Claire (Clean Air Engine) technology program covers all the technology that, in the long term, will need to be developed in order to achieve reductions in CO_2 and noise emissions.

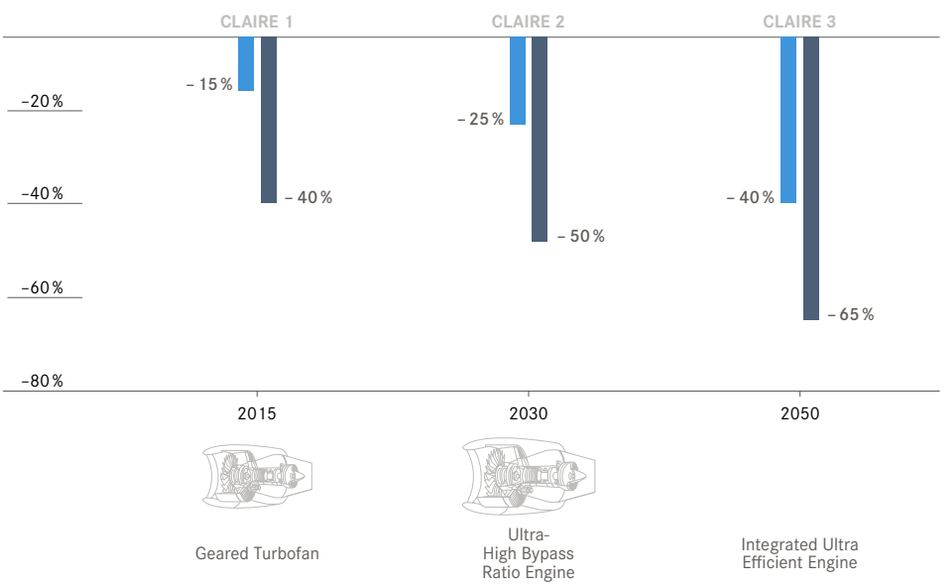
The first stage is the Geared Turbofan™ (GTF), which was developed in partnership with Pratt & Whitney and entered series production in early 2016 for the Airbus A320neo. The GTF reduces fuel consumption and hence carbon dioxide emissions by around 16 % (see also Commercial engine programs).

Proof-of-concept studies for the next stage show that further improvements are possible on the basis of the GTF engine configuration. The engineers want to achieve an even lower fan compression ratio, for instance, and further improve thermal efficiency by means of higher temperature and pressure ratios. The goal is to cut fuel consumption and carbon dioxide emissions by 25 % each and to halve noise emissions.

Concepts for the year 2050

The third stage of the Claire program will see the introduction of revolutionary new features. Further improvements in thrust efficiency call for even higher mass flows at lower fan compression ratios, made possible for example by integrated and distributed fans on the aircraft. A highly efficient heat exchanger, for example featuring a variable cycle, recuperative elements, combined processes or hybrid elements, will be needed as a power source. MTU is investigating these concepts together with partners for the year 2050. Initial estimates promise a reduction in fuel consumption of 40 % and a reduction in noise emissions of up to 65 %.

MTU'S Claire (Clean Air Engine) technology program



	2015	2030	2050
	Geared Turbofan	Ultra-High Bypass Ratio Engine	Integrated Ultra Efficient Engine
Propulsion component	Geared turbofan bypass ratio ~ 12	Geared turbofan bypass ratio 15 – 20	Integrated engine low specific thrust
Core engine	Gas turbine overall pressure ratio ~ 50	Gas turbine overall pressure ratio up to 70	Highly efficient heat exchanger

Technologies for key engines of the future

Commercial engine programs

In cooperation with Pratt & Whitney, MTU is working on the Geared Turbofan™ (GTF) engine. Unlike conventional turbofans, in which the fan and low-pressure turbine run at the same speed on a single shaft, the GTF links the two components using a reduction gear. This enables the fan, with its larger radius, to rotate more slowly than the low-pressure compressor and low-pressure turbine. This in turn means that lower fan compression ratios and thus higher bypass ratios can be generated, and all components can be run at their most efficient rotation speed. The new GTF technology cuts both fuel consumption and CO_2 emissions by 16% and reduces the noise footprint by 75%. What is more, the engine is lighter because its low-pressure turbine and low-pressure compressor require fewer stages. In the GTF project, MTU is responsible for developing and manufacturing the high-speed low-pressure turbine, the front half of the high-pressure compressor and four brush seals. MTU will also carry out final assembly and acceptance testing of 30% of the series-production GTF engines for the A320neo, and is a partner in the MRO network for the GTF.

Milestones in the GTF engine programs

In the 2017 financial year, the certifications of the PW1900G and the PW1200G engines by the U.S. Federal Aviation Administration (FAA) were the most important milestones in the GTF engine programs. These engines power the Embraer E190-E2 and E195-E2 as well as the new Mitsubishi regional jet (MRJ). Thus, with the exception of the PW1700G for the Embraer E170-E2, the entire PW1000G engine family is now licensed for commercial operation.

The PW1100G-JM already clocked up its 100,000th hour in service at the beginning of 2017, surpassing all expectations in terms of significantly reduced fuel consumption and lower noise emissions. However, there were a few operational start-up problems, for which Pratt & Whitney together with its partners is introducing improvements.

Geared Turbofan™ engines have already been chosen by five different aircraft manufacturers. With firm orders and options for more than 8,000 units placed by the end of 2017, the GTF promises to be a major commercial success.

MTU - GTF engine programs

Engine	MTU program share	Aircraft manufacturer	Aircraft type
PW1100G-JM	18%	Airbus	A320neo
PW1200G	15%	Mitsubishi	MRJ
PW1400G-JM	18%	Irkut	MC-21
PW1500G	17%	Bombardier	C Series
PW1700G	15%	Embraer	E-Jet E175-E2
PW1900G	17%	Embraer	E-Jet E190-E2 / E195-E2

Based on the same core engine but without a reduction gear, the PW800 family of engines is a variation of the Geared Turbofan™ engine. In February 2017, the Canadian authorities certified the PW814GA and the PW815GA engines, which power the high-speed Gulfstream G500 and G600 business jets. A third model, the PW812, successfully completed its first test run in July; the rollout is planned for 2022.

MTU has secured a significant share in the market for high-thrust engines for long-haul jets. As a partner in General Electric's GE9X program for the new Boeing B777X, the company is responsible for the development and manufacture of the extremely demanding turbine center frame. The engine is scheduled for certification in 2019.

Military engine programs

The TP400-D6 for the Airbus A400M military transporter is the most powerful turboprop engine in the Western world. MTU supplies the entire intermediate-pressure section, as well as parts of the control and monitoring system, which were developed in cooperation with French partner Safran Aircraft Engines. Series production of the TP400-D6 covers manufacturing the MTU components, final assembly of the entire engine and execution of acceptance tests at the Ludwigsfelde location. As part of its maintenance and repair services for the German Air Force, MTU also carries out dismantling and reassembly of engines, including acceptance tests.

The T408 (formerly GE38) is the first U.S. military program in which MTU has been involved right from the development phase. The T408-1B engine powers the CH-53K heavy-lift cargo helicopter that Sikorsky is developing for the United States Marine Corps. The flight tests are going well.

The EJ200 engine powers the Eurofighter and is in service with numerous air forces. Within the framework of the NATO Eurofighter and Tornado Management Agency (NETMA), the participating nations have agreed to develop a midlife update for the Eurofighter to enhance its functional capabilities. In line with this, the EJ200 engine will be re-engineered to incorporate the latest advanced technologies.

Component technologies

Continuous development of technologies

MTU has built up a technological lead in the fields of low-pressure turbines, high-pressure compressors and turbine center frames that it aims to further increase. In order to do so, it has to continue further developing these technologies.

At the end of March 2017, the large-scale European Clean Sky 1 technology program was completed. MTU's contribution was a full-engine demonstrator based on the PW1500G Geared Turbofan™ engine. Various new technologies, new materials, designs and construction methods, new damping systems, brush seals, additively manufactured seal support systems and lightweight ceramic and carbon-fiber reinforced composite materials were successfully validated under real-life operating conditions.

Further efficiency improvements can be achieved by optimizing the complete compressor system, consisting of low-pressure compressor, inter-compressor duct and high-pressure compressor, rather than by optimizing each component individually. To this end, within the framework of Clean Sky 2, MTU has designed, constructed and pilot tested a corresponding compressor system.

In order to reduce the noise emissions of the low-pressure turbine, a new turbine exit case (TEC) with integrated acoustic lining was designed and integrated into a low-pressure turbine. Aerodynamic and acoustic measurements in the altitude wind tunnel produced promising results.

Industry 4.0

The trend toward digitalization and connected supply chains heralds the fourth industrial revolution, after the invention of the steam engine, the automated production line and the computer. People, machines, plants, logistics and products communicate and cooperate with each other, so that, for example, production now largely organizes itself. In cooperation with an interdisciplinary work group, MTU is currently defining its related demands and needs. In doing so, MTU examines the product's entire life cycle and value chain, from its conception to its development, manufacture and maintenance.

The use of simulation tools in materials design and product manufacturing is one of the focuses at MTU. The goal is to integrate these two processes using computer simulations, and to align all the parameters with each other in such a way that a component with the desired characteristics and features results. This method enables a large number of options to be tried out in a very short time, giving rise to significant cost savings and better product features. MTU has already achieved initial successes in the field of additive manufacturing.

Manufacturing and maintenance technologies

Manufacturing complex components

Additive manufacturing processes are opening the way to new methods of production. These processes involve using a laser to melt successively applied, very thin layers of powder material and in this way build up entire components. MTU is one of the first companies to employ additive manufacturing in series production, to make the borescope eyepieces used when inspecting PW1100G-JM engines. Preparations are underway to introduce this type of process to manufacture complex components such as seal support systems, center frame struts and bearing housings. The longer-term plan is to create new designs that would be either impossible or very costly to implement using traditional technology. To further drive additive manufacturing forward, all activities have been brought together in a new unit with a significantly higher number of employees.

In cooperation with the Fraunhofer Institute for Production Technology in Aachen, MTU has established the blisk technology center (“Technikum Blisk”), which is intended to reduce the burden on MTU’s new blisk production center: in the future, blisk prototypes with an individual design for the new generation of Geared Turbofan™ engines will be produced in Aachen for aerodynamic tests. Thus the blisk technology center frees up production capacities and promotes the development of new technologies.

Final assembly of a third of the PW1100G-JM Geared Turbofan™ engines is conducted in Munich. A flexible new assembly line has been set up for this purpose. It uses a transport system similar to an assembly line, into which pre-assembled components and modules are fed from the side for final assembly.

Materials

The next generation of Geared Turbofan™ engines will necessitate innovation advances in materials development. For example, higher bypass ratios require lighter materials to compensate for the additional weight, while increasing combustion temperatures demand higher thermal stability. This is the purpose of the “New materials” project initiated at the start of 2017, in which MTU, in collaboration with research institutions and suppliers, is developing and introducing enhanced metallic as well as innovative inter-metallic and ceramic materials, including the requisite protective coatings, in particular for the low-pressure turbine.

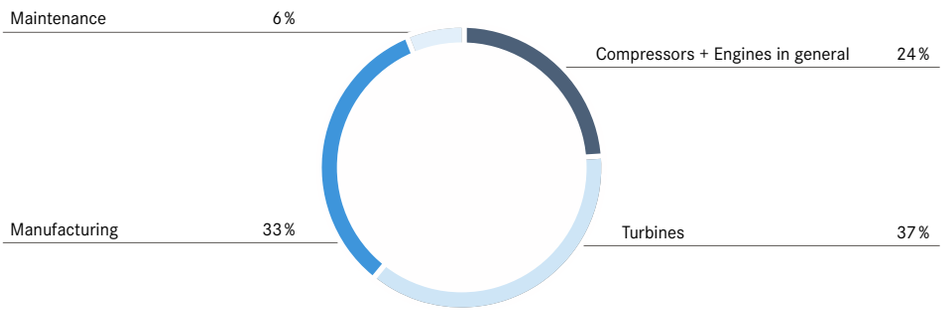
Testing facilities for critical components are an essential factor in the development of aircraft engines. In October 2017, MTU therefore laid the foundation stone for a new test center in Munich. The test center will carry out 70 different testing procedures, including rotation tests, structural tests and material validation tests. The centerpiece is a high-performance spin test stand capable of realizing uniquely complex test setups and loads.

Protecting technology assets (intellectual capital)

At December 31, 2017, MTU's portfolio of intellectual property (IP) rights contained 1,132 patent families (representing 3,510 individual patents). A patent family is a set of patents taken in various countries to protect a single invention. At the reporting date, this portfolio covered the following fields of technology:

Over 1,000 patent families

Distribution of the group's intellectual property portfolio over MTU's various fields of technology



Cooperation in science and research

For decades, cooperation arrangements with universities and research institutions have formed a key component of MTU's research and development activities. For instance, specimen engines are made available to universities and colleges, and MTU experts hold lectures or act as mentors for students working on experimental projects or writing theses and dissertations for diplomas and doctorates; students are also given support while carrying out their assignments and preparing their final thesis presentations. MTU established a chair in structural mechanics at the University of Stuttgart's Institute for Aircraft Engines. In addition, MTU honors outstanding achievements by awarding the annual Heilmann prize to a young scientist meriting recognition for achievements in engine technology.

Strategic alliances have been established with research partners in order to strengthen ties between universities and industry, and to safeguard MTU's innovative capabilities. In recent years, these partnerships with leading German universities and research institutions have been consolidated, and six centers of competence focusing on specific areas of research have been set up with the aim of optimizing collaboration. Based in Munich, Bauhaus Luftfahrt is a visionary think tank with an international dimension that pursues novel, unconventional, holistic and interdisciplinary research. It brings industry and science together under one roof, focusing primarily on exploring the socioeconomic, political and ecological aspects of aviation, designing visionary aircraft, unearthing promising technologies for the future and devising knowledge management strategies.

Capital expenditure on research and development

Research and development expenditure

in € million	2017	2016	Change 2017 - 2016 in € million	Change 2017 - 2016 in %
Commercial engine business (OEM)	182.3	188.0	–5.7	–3.0
Military engine business (OEM)	13.1	15.5	–2.4	–15.5
Commercial maintenance business (MRO)	4.3	5.1	–0.8	–15.7
Total research and development expenditure	**199.7**	**208.6**	**–8.9**	**–4.3**
Customer-funded R&D expenditure	–31.9	–40.6	8.7	21.4
Company-funded R&D expenditure	**167.8**	**168.0**	**–0.2**	**–0.1**
Expenditure meeting recognition criteria for intangible assets				
Commercial and military engine business (OEM)	–90.7	–96.2	5.5	5.7
Commercial maintenance business (MRO)	–0.5	–0.7	0.2	28.6
Research and development costs recognized as expense	**76.6**	**71.1**	**5.5**	**7.7**
Amortization of capitalized development costs	14.2	10.2	4.0	39.2
R&D expenditure impact on EBIT adjusted	**90.8**	**81.3**	**9.5**	**11.7**

R&D quota of
4.0%

Research and development expenditure in the reporting period totaled € 199.7 million, down € 8.9 million on the previous year. At 4.0%, research and development expenditure as a percentage of revenues was slightly lower than the 2016 figure of 4.4%.

Externally funded development expenditure in the amount of € 31.9 million (2016: € 40.6 million) primarily relates to public grants for research and development of more fuel-efficient and quieter engines.

Company-funded development expenditure originates from the group's own resources. If such expenditure meets the criteria for capitalization as an internally generated intangible asset, it is removed from the income statement and reported in the balance sheet. Capitalized development costs are amortized on a straight-line basis over the estimated economic life of the product. Company-funded expenditure is disclosed in Note 3 to the consolidated financial statements (Research and development expenses).

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The expenditure meeting recognition criteria for intangible assets of € 90.7 million (2016: € 96.2 million) posted in the OEM segment (commercial and military engine business) relates especially to the GTF, GE9X and PW800 engine programs. The amortization expense on capitalized development costs recognized under cost of sales relates principally to the PW1000G family of engines.

Business environment

Macroeconomic factors

In 2017, the upturn in the global economy continued with growth of 3.0% overall compared with 2.3% in 2016. The economic output increased in the Eurozone, the USA, China and Japan.

The United States is experiencing a robust upswing, with the U.S. economy growing by 2.2% in 2017 compared with 1.5% in the previous year. Consumers accounted for the highest surge in growth, while increased capital expenditure by companies also made a substantial contribution.

The Eurozone recorded strong growth in 2017: following five years of moderate recovery, growth in Europe accelerated with an increase of 2.5% compared with 1.8% in 2016. Consumer spending proved to be the largest driver of growth. Investment activity continued on a high level, coupled with a rise in exports. The upswing in the euro area also extended to an increasing number of member states.

China's economy continued to expand unabated, and the country made the biggest contribution to global growth, with economic data showing an increase of 6.8% (2016: 6.7%). The shift in the Chinese national economy toward a more consumer-driven society persisted.

The Energy Information Administration (EIA) averaged the price of a barrel of Brent crude oil at U.S. $ 54 over the year. While that is higher than the average price of U.S. $ 44 in 2016, oil prices remained low compared with the years 2010 to 2014.

Microeconomic factors in the aviation industry

Airline profits once again developed very positively. Strong demand, successful efficiency improvements and consolidation measures were just some of the reasons behind this trend. Continued low oil prices, an important factor in calculating operating costs, also had a positive effect.

According to the International Air Transport Association, IATA, global passenger traffic, at 7.5%, increased at an above-average rate in 2017. Growth in demand varied from region to region – rising by 4.0% in North America, by 8.0% in Europe and by 10.0% in Asia.

Global passenger traffic
up by 7.5%

Rising passenger numbers prompted airlines to expand their fleets, and the global fleet grew by 5.2% in 2017 (source: Fleetanalyzer).

IATA calculated industry-wide net income of U.S. $ 34.5 billion for 2017, making this the third consecutive year in which the airlines surpassed the U.S. $ 30 billion profit mark.

Airbus and Boeing delivered 1,443 aircraft in 2017, roughly the same as in the previous year. The order backlog for aircraft seating 100 or more passengers increased slightly, to around 13,800 aircraft. Assuming unchanged production rates, in arithmetical terms the order backlog covers a production workload of nine years (source: Fleetanalyzer).

434 business jets were delivered in the first nine months of 2017, up 1.4% on the same period of 2016, in which 428 aircraft were delivered (source: GAMA, November 13, 2017).

Overall assessment of the business environment

Global economic growth
3.0 %

In 2017, the global economy grew by 3.0 %, which is the highest upswing of the decade so far. The increase in passenger traffic and continued low oil prices had a positive impact on the aviation industry. The airlines posted their third-highest profits in 2017, with Airbus and Boeing delivering 1,443 aircraft. At 13,800 orders, the order backlog for aircraft seating 100 or more passengers remained at a high level.

Financial situation

The following explanatory comments and analyses are based on the audited MTU consolidated financial statements for the financial years ending December 31, 2017 and 2016. The consolidated financial statements were drawn up in accordance with the International Financial Reporting Standards (IFRSs) issued by the International Accounting Standards Board (IASB), to the extent that these have been adopted by the European Union.

In accordance with IFRS requirements, new or revised/amended standards and interpretations were applied for the first time in the financial statements for 2017. Their effect on the group's financial situation, net assets and operating results is dealt with in more detail in the Notes to the consolidated financial statements (under: Accounting standards and interpretations, and revised/amended accounting standards and interpretations, applied for the first time in 2017).

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The exchange rates used for converting the company's key foreign currencies into euros are the following official rates set by the European Central Bank:

Foreign currency exchange rates

Currency	ISO code	Rate at reporting date		Average rate	
		Dec. 31, 2017 1 Euro =	Dec. 31, 2016 1 Euro =	2017 1 Euro =	2016 1 Euro =
United States dollar	USD	1.1993	1.0541	1.1297	1.1069
Canadian dollar	CAD	1.5039	1.4188	1.4647	1.4659
Chinese yuan renminbi	CNY	7.8044	7.3202	7.6290	7.3522
Polish zloty	PLN	4.1770	4.4103	4.2570	4.3632

Operating results

Group

Order backlog

MTU's order backlog consists of firm customer orders that commit the group to delivering products or providing services, plus the contractual value of service agreements. At December 31, 2017, the order backlog (before consolidation) amounted to € 13.2 billion (2016: € 14.2 billion). Factors that influenced the order backlog in the reporting period were the weaker U.S. dollar exchange rate against the euro and working off the high existing order backlog.

Consolidated income statement

			Change 2017 - 2016	
in € million	2017	2016	in € million	in %
Revenues	**5,036.3**	**4,732.7**	**303.6**	**6.4**
Cost of sales	–4,266.4	–4,074.8	–191.6	–4.7
Gross profit	**769.9**	**657.9**	**112.0**	**17.0**
Costs by function	–214.6	–205.1	–9.5	–4.6
Earnings before interest and tax (EBIT)	**555.3**	**452.8**	**102.5**	**22.6**
Financial result	–40.0	–37.2	–2.8	–7.5
Earnings before tax	**515.3**	**415.6**	**99.7**	**24.0**
Income taxes	–133.5	–103.0	–30.5	–29.6
Net income	**381.8**	**312.6**	**69.2**	**22.1**
Basic earnings per share in €	7.35	6.09	1.26	20.7
Diluted earnings per share in €	6.88	5.83	1.05	18.0

Revenues

The growth in group revenues in 2017 is due in particular to the evolution of the MRO segment (commercial maintenance business). Revenues in this segment (before consolidation) rose by € 370.9 million from € 1,914.4 million in the previous year to € 2,285.3 million. In the OEM segment (commercial and military engine business), revenues (before consolidation) decreased by € 31.5 million from € 2,905.2 million in 2016 to € 2,873.7 million. This drop in revenues in the OEM segment is mainly due to the postponement of deliveries of production engines in the GTF programs, a contraction of the military engine business compared with the previous year and the effect of the U.S.-dollar exchange rate, which could not be fully compensated by strong revenues from spare parts sales.

Group revenues up
6.4 %

Gross margin increased to
15.3%

Cost of sales and gross profit

The rise in the cost of sales is accounted for by the increase in the business volume. However, compared with the growth in revenues, the cost of sales increased at a proportionately lower rate. This resulted in an improved gross margin, which amounted to 15.3% in 2017 (2016: 13.9%). The main factors responsible for this change were the strong growth in the MRO segment and product mix in the OEM segment.

Reconciliation of adjusted performance indicators

The purpose of reconciliation is to eliminate the effect of non-recurring items and events on the key performance indicators used to measure the group's operating results and those of the individual operating segments, thereby facilitating a true comparison from year to year and between MTU and other companies.

MTU utilizes the following adjusted performance indicators in its financial reports: adjusted earnings before interest and tax (EBIT adjusted), EBIT adjusted margin, and net income adjusted. The International Financial Reporting Standards (IFRSs) do not stipulate any requirements concerning such indicators, which should be viewed as supplementary to the performance indicators reported in accordance with IFRSs.

In order to further facilitate comparison, adjustments have been applied to eliminate the effects on EBIT of income and expense items resulting from the purchase price allocation and the increase in the company's stake in the IAE-V2500 engine program. As of January 1, 2004, MTU passed into the ownership of Kohlberg Kravis Roberts & Co. Ltd. (KKR), following the investment company's purchase of 100% of the MTU shares from the then DaimlerChrysler AG. In the context of the acquisition, assets, liabilities and contingent liabilities were identified in accordance with IFRS 3 and measured at fair value. Since then, the identified intangible assets, in particular, have led to considerable amortization expenses. These expenses are referred to collectively as "effects of purchase price allocation." Another effect on EBIT eliminated by means of adjustments is MTU's purchase in 2012 of additional shares in the IAE-V2500 engine program. This resulted in the recognition of an intangible asset (reported as "IAE-V2500 stake increase") that will be amortized over its estimated economic life of 25 years.

Similarly, the effect of non-recurring items is eliminated from earnings before tax. In a first step, the interest result and the interest portion included in the measurement of plan assets and provisions for pensions and similar obligations, as stated in the financial result on other items, are added to EBIT adjusted. Further adjustments are then made to remove the effects of all other components of the financial result on other items, in particular those that are influenced by the U.S. dollar exchange rate, such as instruments used to hedge against currency risk.

The adjusted amount of earnings before tax is used to determine the adjusted amount of net income. The normalized income tax expense is calculated on the basis of the expected average tax rate for the group (for the financial year 2017: 29%). The profit / loss of companies accounted for using the equity method does not form part of the tax basis.

Reconciliation of the consolidated income statement

in € million	2017 As reported	2017 Non-recurring items	2017 After adjustments	2016 As reported	2016 Non-recurring items	2016 After adjustments
Revenues	**5,036.3**		**5,036.3**	**4,732.7**		**4,732.7**
Cost of sales	–4,266.4		–4,266.4	–4,074.8		–4,074.8
thereof depreciation / amortization due to purchase price allocation / V 2500 stake increase		51.3	51.3		50.2	50.2
Gross profit	**769.9**	**51.3**	**821.2**	**657.9**	**50.2**	**708.1**
Research and development expenses	–76.6		–76.6	–71.1		–71.1
Selling expenses	–102.2		–102.2	–104.0		–104.0
General administrative expenses	–76.8		–76.8	–70.8		–70.8
Other operating income and expenses	–2.9		–2.9	10.1		10.1
Profit / loss of companies accounted for using the equity method	42.4		42.4	28.6		28.6
Profit / loss of companies accounted for at cost	1.5		1.5	2.1		2.1
Earnings before interest and tax (EBIT)	**555.3**	**51.3**	**606.6**	**452.8**	**50.2**	**503.0**
Financial result	–40.0	20.4	–19.6	–37.2	9.0	–28.2
Earnings before tax	**515.3**	**71.7**	**587.0**	**415.6**	**59.2**	**474.8**
Income taxes	–133.5	–24.4	–157.9	–103.0	–26.4	–129.4
Net income	**381.8**	**47.3**	**429.1**	**312.6**	**32.8**	**345.4**

Earnings before interest and tax (EBIT)

In 2017, the cost of sales and costs by function increased at a proportionately lower rate than revenues. Earnings before interest and tax (EBIT) consequently improved by € 102.5 million (22.6 %) compared with the previous year. The EBIT margin rose by 1.4 percentage points to 11.0 % (2016: 9.6 %). Earnings before interest and tax adjusted(EBIT adjusted) increased by € 103.6 million, which is 20.6 % higher than in 2016. The EBIT adjusted margin was 12.0 % (2016: 10.6 %).

EBIT adjusted
€ 606.6 million

Financial result

MTU's financial result deteriorated by € 2.8 million in the financial year 2017 resulting in a net expense of € 40.0 million (2016: € 37.2 million). This is a result of various, in some cases opposing effects such as lower interest expenses for bonds, increased interest income from aircraft financing and lower interest expenses from the measurement of pension provisions on the one hand and increased exchange rate losses from financial transactions coupled with lower capitalized interest on borrowing costs on the other.

Earnings before tax (EBT)

The company's good operating performance had an especially positive impact on earnings before tax. Overall, EBT rose by € 99.7 million to € 515.3 million (2016: € 415.6 million).

Income taxes

Income taxes amounted to € 133.5 million in the financial year 2017 (2016: € 103.0 million). The effective group tax rate, calculated on the basis of earnings before tax, was 25.9 % (2016: 24.8 %). Information on the reconciliation of the expected tax expense to the actual tax expense is provided in Note 10 to the consolidated financial statements (Income taxes).

→ further information on page 193

Net income (NI)

Net income increased by € 69.2 million (22.1%) to € 381.8 million (2016: € 312.6 million) and, correspondingly net income adjusted by € 83.7 million (24.2%) to € 429.1 million (2016: € 345.4 million).

Consolidated statement of comprehensive income

In the consolidated statement of comprehensive income, net income amounting to € 381.8 million (2016: € 312.6 million) are reconciled with the total comprehensive income for the period of € 535.9 million (2016: € 251.2 million).

The main income and expense item recognized directly in other comprehensive income in 2017, net of deferred taxes, was the fair value gain on hedging instruments amounting to € 151.0 million (2016: fair value loss of € 1.6 million). Other positive effects resulted from the measurement of pension provisions.

Earnings per share

Earnings per share
€ 7.35

Basic earnings per share amounted to € 7.35 (2016: € 6.09). In view of the recognition of the maximum number of exercisable share conversion options in respect of the convertible bond issued in 2016, diluted earnings per share amounted to € 6.88 (2016: € 5.83).

Net profit available for distribution and dividend

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For an explanation of how the net profit is determined on the basis of the German GAAP annual financial statements, please refer to Part VII of the Notes to the consolidated financial statements. It is planned to propose to the Annual General Meeting on April 11, 2018 that a dividend of € 2.30 (2016: € 1.90) per share be distributed for the financial year 2017. This corresponds to a total dividend payment / distribution amount of € 118.4 million (2016: € 97.6 million).

OEM segment

Order backlog

The order backlog for the OEM segment (commercial and military engine business) is reported on the basis of list prices. The order backlog in the OEM segment stood at € 5,814.8 million as of December 31, 2017, compared with € 7,246.0 million at the end of 2016.

OEM order backlog
€ 5.8 billion

Order backlog for commercial and military engine business (OEM)

			Change 2017 - 2016	
in million	Dec. 31, 2017	Dec. 31, 2016	in million	in %
Commercial engines in U.S. $	6,617.7	7,113.6	–495.9	–7.0
Commercial engines in €	5,518.0	6,748.5	–1,230.5	–18.2
Military engines in €	296.8	497.5	–200.7	–40.3
Total order backlog in €	**5,814.8**	**7,246.0**	**–1,431.2**	**–19.8**

Commercial engine business

The invoiced value of MTU's order book for commercial engines, reported on the basis of list prices and expressed in U.S. dollars, stood at U.S. $ 6,617.7 million as of December 31, 2017, and was thus U.S. $ 495.9 million (7.0%) lower than the 2016 figure of U.S. $ 7,113.6 million.

Translated into euros at the 2017 year-end closing rate, and thus taking exchange rate effects into account, the order backlog decreased by € 1,230.5 million (18.2%) to € 5,518.0 million (2016: € 6,748.5 million).

Military engine business

In the case of military programs, the customer typically places an order for goods and services that are called up on demand over several years. The full value of the contract flows into the order backlog when the contract is signed. This order backlog reduces over a prolonged period of time, in line with services and deliveries executed, leading to fluctuations in the order backlog year on year.

The volume of orders for military engines, which are contracted in euros, totaled € 296.8 million at the end of 2017. This was € 200.7 million (40.3%) below the previous year's amount of € 497.5 million.

In arithmetical terms, the order backlog for the OEM segment (commercial and military engine business) corresponds to approximately two years' production capacity.

Revenues

The company generated revenues of € 2,873.7 million in the OEM segment, which is slightly lower than the previous year's figure (2016: € 2,905.2 million).

Revenues in the commercial engine business increased despite the effect of the U.S.-dollar exchange rate by € 68.2 million (2.8%) to € 2,469.4 million. The engines that generated the largest shares of these revenues in 2017 were the V2500 and the PW1100G-JM for the A320 and A320neo family and the GEnx for Boeing's 787 Dreamliner and 747-8.

Revenues in the military engine business were lower than in 2016, decreasing by € 99.7 million (19.8%) from € 504.0 million to € 404.3 million. The main source of these revenues in the reporting period were the EJ200 engine for the Eurofighter and the RB199 engine for the Panavia Tornado and the TP400-D6 for the A400M military transporter respectively.

Revenues and EBIT adjusted (OEM)

in € million	2017	2016	Change 2017 - 2016 in € million	Change 2017 - 2016 in %
Revenues	**2,873.7**	**2,905.2**	**–31.5**	**–1.1**
Cost of sales	–2,344.7	–2,482.6	137.9	5.6
Gross profit	**529.0**	**422.6**	**106.4**	**25.2**
Gross margin in %	18.4	14.5		
EBIT adjusted	**412.2**	**321.5**	**90.7**	**28.2**
EBIT adjusted margin in %	14.3	11.1		

EBIT adjusted

Earnings before interest and tax adjusted (EBIT adjusted) in the OEM segment increased by € 90.7 million to € 412.2 million (2016: € 321.5 million). The EBIT adjusted margin increased accordingly from 11.1% to 14.3%. Operating profit benefited in particular from the implemented product mix, especially from the increase in revenues from spare parts sales relating to the V2500 program, the PW2000, the GE programs for the LM and CF6-80 series and in an isolated case from the measurement of a foreign exchange item at the reporting date, mainly in respect of trade receivables and payables. These effects outweighed the impact resulting from the ramp-up of the new engine programs, in particular the PW1100G-JM.

Capital expenditure

Capital expenditure on intangible assets amounted to € 114.0 million (2016: € 114.3 million) and mainly concerned capitalized development costs for the GTF engines and for the GE9X and PW800 programs. Capital expenditure on property, plant and equipment amounted to € 139.8 million (2016: € 112.1 million) and related principally to other equipment, operational and office equipment and construction in progress required in respect of the expansion of production capacities of the Geared Turbofan™ programs.

Employees

The average number of employees in the OEM segment increased by 111 to 5,474 (2016: 5,363).

MRO segment

MRO order backlog increased by
€ 7.4 billion

Order backlog

The order backlog in the MRO segment (commercial maintenance business) comprises the value of orders for separately contracted maintenance and repair work on engines that have been delivered to the maintenance shop plus the value of long-term service agreements.

Order backlog for commercial maintenance business (MRO)

in million	Dec. 31, 2017	Dec. 31, 2016	Change 2017 - 2016 in million	Change 2017 - 2016 in %
Order backlog in U.S. $	8,886.6	7,300.9	1,585.7	21.7
Order backlog in €	**7,409.9**	**6,926.2**	**483.7**	**7.0**

The majority of contracts in the MRO segment are priced in U.S. dollars. The order backlog for the commercial maintenance business in 2017 amounted to U.S. $ 8,886.6 million, which is U.S. $ 1,585.7 million or 21.7% higher than the 2016 figure of U.S. $ 7,300.9 million, and is largely attributable to long-term service agreements, which on account of their multi-annual nature led to volatilities in comparison with the previous year.

Correspondingly, translated into euros at the 2017 year-end closing rate, the order backlog increased by € 483.7 million (7.0%) to € 7,409.9 million (2016: € 6,926.2 million).

In arithmetical terms, the order backlog represents a production workload of approximately 3 years.

Revenues

MTU's revenues in the commercial maintenance business (before consolidation) increased by € 370.9 million (19.4%) to € 2,285.3 million (2016: € 1,914.4 million). The key revenue driver was the V2500 engine that powers the A320, followed by the CF34 utilized in diverse business and regional jet applications.

MRO revenues increased by
19.4%

Revenues and EBIT adjusted (MRO)

			Change 2017 - 2016	
in € million	2017	2016	in € million	in %
Revenues	**2,285.3**	**1,914.4**	**370.9**	**19.4**
Cost of sales	–2,045.5	–1,679.6	–365.9	–21.8
Gross profit	**239.8**	**234.8**	**5.0**	**2.1**
Gross margin in %	10.5	12.3		
EBIT adjusted	**194.4**	**181.5**	**12.9**	**7.1**
EBIT adjusted margin in %	8.5	9.5		

EBIT adjusted

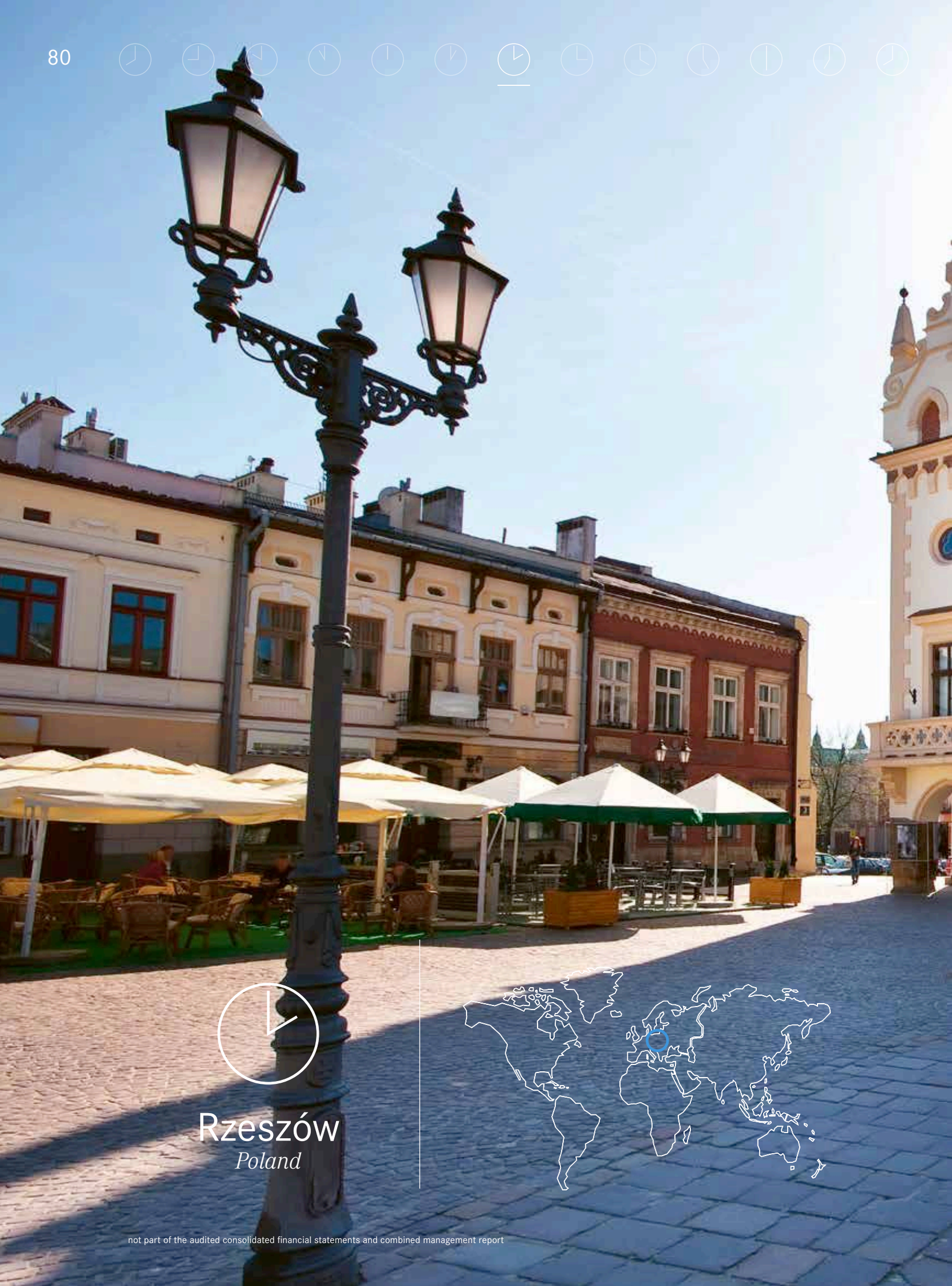
In 2017, in line with the increase in revenues, EBIT adjusted for the MRO segment grew by € 12.9 million (7.1%) to € 194.4 million. The EBIT adjusted margin decreased to 8.5% (2016: 9.5%), as a result of the product mix.

Capital expenditure

Capital expenditure on intangible assets and property, plant and equipment increased by € 9.3 million to € 57.7 million (2016: € 48.4 million). This increase was mainly due to capacity-related new and replacement purchases, which led to an increase in other equipment, operational and office equipment and construction in progress.

Employees

In order to cope with the high workload at the MRO locations, the average number of employees in the MRO segment was increased by 151 to 3,140 (2016: 2,989).

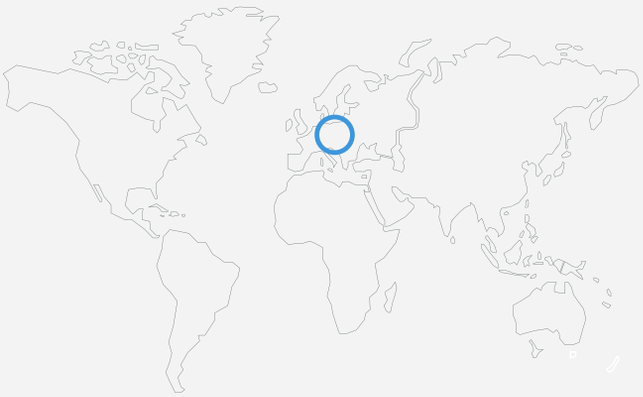


Rzeszów
Poland

not part of the audited consolidated financial statements and combined management report

The star of Poland's Aviation Valley: MTU Aero Engines Polska

Rzeszów
Poland



The star of Poland's Aviation Valley: MTU Aero Engines Polska

BACKGROUND INFORMATION

EME AERO
ENGINE MAINTENANCE EUROPE

Poland has been chosen as the location for EME Aero, the 50/50 joint venture recently founded by MTU and Lufthansa Technik for the maintenance of Geared Turbofan™ (GTF) aircraft engines. The site will open for business in 2020 and eventually provide work for around 800 people. The aim is to create the most efficient maintenance shop for GTF engines. The creation of EME Aero marks another step forward in MTU's successful partnership strategy. Lufthansa Technik and MTU have been operating a similar joint venture in Malaysia–Airfoil Services Sdn. Bhd–since 2003.

Growing from strength to strength: the MTU Aero Engines Polska site in Rzeszów.

Expert to expert: the key to efficient knowledge and technology transfer

It's 2 p.m. in Rzeszów, Poland, and the latest GEnx turbine center frame (TCF) to come off the final assembly line is being prepared for delivery to MTU's OEM partner, GE Aviation. Krzysztof Zuzak, Managing Director of MTU Aero Engines Polska, is supervising each step of the process. He clearly remembers the day in spring 2017 when the first GEnx TCF module left the shop. "It was an important milestone for us. MTU's decision to establish an assembly line for the GEnx turbine center frame here in Poland testifies to the group's confidence in our skilled workforce." The responsibility for assembling this module, which forms part of the engine that powers the Boeing 787 and

747-8, was transferred to Poland from Munich, where the focus now lies on final assembly of the PW1100G-JM engine for the A320neo. Obviously, the relocation of a module assembly line of this complexity can't be done overnight. Fitters who had worked on the TCF assembly line in Munich passed on their know-how to their Polish colleagues in a phased series of training sessions. "The knowledge and technology transfer ran just as smoothly as the teamwork," recalls Jan Florian, production manager at MTU Aero Engines Polska.

A location growing from strength to strength

Looking further back, the successful relocation of the TCF assembly line is merely the latest step in the continuing successful development of the MTU subsidiary in Poland. Since 2009, when MTU Aero Engines established its facility on the outskirts of Rzeszów Airport, the location has grown substantially. So much so that in 2015 a new 10,000-square-meter annex was inaugurated. "When MTU Aero Engines Polska was founded, it had 200 employees–today that number has risen to over 700. The company undeniably owes its success to the strong working relationship on every level between the German and Polish teams," says Zuzak.

A wide range of activities

You don't need to look far to find examples of successful collaboration across locations, given that MTU Aero Engines Polska performs a wide range of activities including many with an international dimension. The facility develops and produces blades and low-pressure turbine components for the GP7000, V2500, PW300 and PW500 engines and for the LM6000 series of industrial gas turbines. MTU's subsidiary in Poland is also responsible for assembling low-pressure turbines for the V2500, PW300 and PW500 engines. Another of its activities is the repair of engine components such as tubing and various other accessories. The Polish location also works on the Geared Turbofan™ programs, notably during the pre-production phase but also, for example, by manufacturing engine components such as turbine blades.

"MTU Aero Engines Polska owes its success to the strong working relationship on every level between the German and Polish teams."

Krzysztof Zuzak· Managing Director of MTU Aero Engines Polska

Every part must be adjusted with perfect precision when assembling the GEnx turbine center frame. MTU holds a 6.65-percent workshare in the GEnx engine that powers the Boeing 787 and 747-8.

Financial situation

Principles and objectives of financial management

Financial flexibility

The main objectives of financial management are to ensure that the group always has access to adequate liquidity, to avoid financial risks, and to diversify sources of financing in the interests of flexibility. In order to ensure the company's liquidity and reduce risks, MTU makes use of various internal and external funding sources with differing maturities.

Liquidity forecasts are based on the group's operational and strategic planning, flanked by a monthly rolling (short-term) liquidity forecast.

The cash flow from operating activities in the operating segments represents the group's main source of liquidity. Moreover, MTU utilizes a cash pooling system to transfer the surplus liquidity of individual group companies to other group companies whose cash flow does not cover their funding requirements. This reduces external borrowing requirements and the associated interest expense. MTU also makes use of a variety of internal and external funding instruments to assure its liquidity, including company pension plans, corporate bonds, loan agreements with banks and lease arrangements. For information on the company's capacity to raise funds through authorized and conditional capital increases, please refer to Note 24 to the consolidated financial statements (Equity). Through these diverse measures, MTU has created a stable and sustainable basis on which to assure its future funding requirements.

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Financing instruments

The banking policy, procedures for the approval of banking relationships, loan agreements, liquidity and financial asset management, and the management of currency and interest rate risks are set down in the treasury principles. It is a basic principle of the group that its lines of credit are administered at corporate level by the treasury department.

The group maintains good business relationships with a number of different partner banks, and in this way avoids being too strongly dependent on a single institution. The banking partners are required to have a long-term credit rating of at least investment grade.

Significant external financing sources

Financing instruments	Maturity date	Currency	Interest rate
Registered bond	June 12, 2028	Euro	Fixed
Convertible bond	May 17, 2023	Euro	Fixed
Note purchase agreement	March 27, 2021	Euro	6-month Euribor + margin
Revolving credit facility	October 28, 2022	Euro	Euribor rate + margin
Money market facility	money at call	Euro	Fixed
Finance lease agreements	December 31, 2025	Euro	Fixed

The availability of these financial resources is unrestricted. MTU's revolving credit facility, which is only utilized in part, grants the company even greater scope in its financing activities.

The factors considered when choosing financing instruments include flexibility, credit terms, the profile of maturity dates, and borrowing costs. In keeping with standard banking practice, the main sources of financing include covenants requiring the company to ensure that its performance indicators remain within defined limits. MTU complied with the contractual obligations arising from such covenants at December 31, 2017 and at the end of every quarter of that year. Further information on financing instruments is provided in Note 28 to the consolidated financial statements (Financial liabilities). For information on significant agreements relating to a change of control subsequent to a takeover bid, please refer to the section entitled "Disclosures in connection with the takeover directive".

→ further information on page 215 and page 142

The risk report and Note 36 (Financial risks) to the consolidated financial statements provide information on MTU's approach to the financial risks inherent in credit arrangements and valuation processes, methods used to hedge interest-rate and currency risks, and methods of dealing with price-change, non-payment and liquidity risks.

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As in previous years, MTU did not engage in any transactions in 2017 involving off-balance-sheet financial instruments such as the sale of receivables in connection with asset-backed securities or obligations toward special-purpose entities – with the exception of operating leases and sale-and-leaseback agreements.

Net financial debt

Net financial debt serves as an indicator of the MTU group's financial situation and is defined as the difference between gross financial debt and current financial assets. MTU's net financial debt at December 31, 2017 was € 65.0 million (7.3%) lower than at the same date one year earlier.

Reduced net financial debt

Net financial debt

in € million	Dec. 31, 2017	Dec. 31, 2016	Change 2017 - 2016 in € million	Change 2017 - 2016 in %
Bonds and notes	100.0	353.6	–253.6	–71.7
Convertible bond	478.5	474.6	3.9	0.8
Financial liabilities to banks	108.2	30.1	78.1	>100
thereof: Note purchase agreement	30.1	30.1		
thereof: Revolving credit facility	77.9		77.9	
thereof: Other liabilities to banks	0.2		0.2	
Loans from third parties	18.2		18.2	
Finance lease liabilities	11.5	11.6	–0.1	–0.9
Financial liabilities arising from program participations	370.5	492.0	–121.5	–24.7
thereof: Financial liabilities arising from IAE-V2500 stake increase	320.0	400.3	–80.3	–20.1
Gross financial debt	**1,086.9**	**1,361.9**	**–275.0**	**–20.2**
less:				
Cash and cash equivalents	106.1	322.4	–216.3	–67.1
Loans to third parties	133.5	98.6	34.9	35.4
Loan to related companies	20.3	23.9	–3.6	–15.1
Securities		25.0	–25.0	–100.0
Financial assets	**259.9**	**469.9**	**–210.0**	**–44.7**
Net financial debt	**827.0**	**892.0**	**–65.0**	**–7.3**

Bonds and notes

In order to finance the IAE-V2500 stake increase, MTU AG issued a bond for a nominal amount of € 250.0 million with effect from June 21, 2012. The bond earned an annual rate of interest of 3.0% from the date of issue (June 21, 2012) until the repayment date (June 21, 2017). The interest was payable in arrears on June 21 of each year. The proceeds of the bond issue, net of transaction costs and including a discount of € 1.5 million, were recognized at amortized cost. Scheduled repayment was made on June 21, 2017.

MTU AG issued a registered bond on June 12, 2013 for a total nominal amount of € 100.0 million. The registered bond matures on June 12, 2028 and is subject to interest of 3.55% p.a., payable in arrears on June 12 of each year, for the first time on June 12, 2014. The registered bond, net of transaction costs and including a discount of € 2.7 million, is measured at amortized cost.

In the event of a change of control, every bondholder is entitled to declare due part or all of his/her security instrument holding for the nominal amount plus any accrued interest. A change-of-control event occurs if a qualifying rating is lowered in the course of the change of control. This condition is deemed to be met if (1), during the change-of-control period, a rating previously granted by a rating agency to MTU or to its security instrument is withdrawn or is changed to below investment grade (equivalent to or higher than Baa3 (Moody's) or BBB- (Fitch or S&P)), or if (2), at the time of the change of control, no investment grade rating has been awarded by a rating agency to MTU or to its security instrument, and no investment-grade rating is issued for the security in question within the change-of-control period.

Convertible bond

With effect of May 17, 2016, MTU Aero Engines AG issued a convertible bond in the form of a preferential unsecured debenture, for a total nominal amount of € 500.0 million. This bond is convertible into new and/or existing registered non-par-value shares in the issuing company.

The convertible bond has an original maturity of 7 years and is divided into units of € 100,000. It bears a nominal interest rate of 0.125% per annum, payable annually in arrears.

Bondholders are entitled to convert their certificates into common shares of MTU Aero Engines AG at any time after June 27, 2016. The initial conversion price has been set at € 124.7701 which represents a premium of 50% above the reference rate.

MTU has the right to recall the issued bond units at their nominal value (plus accrued unpaid interest), in accordance with the conditions of issue, at any time on or after June 16, 2020, either (i) if the quoted price of the common share rises to or above 130% of the applicable conversion price or (ii) if no more than 20% of the nominal value of the convertible bond issue is outstanding.

Financial liabilities to banks

Note purchase agreement

MTU Aero Engines AG issued a note purchase agreement on March 28, 2014 for a total nominal amount of € 30.0 million and with a maturity date of March 27, 2021. The note purchase agreement has a variable interest rate corresponding to the 6-month Euribor rate plus a percentage margin. The initial interest rate amounts to 1.72%. The interest is calculated and paid twice a year, in March and September.

Revolving credit facility

Revolving credit facility extended for a further year

At December 31, 2016, the company had access to a revolving credit facility of € 600.0 million with five banks, which ran until October 28, 2021. The term of this line of credit was extended by one year in 2017 and now runs until October 28, 2022. A total of € 90.6 million had been drawn down under this facility at December 31, 2017, € 12.7 million of which in the form of guarantees in favor of third parties (2016: draw-downs totaling € 13.8 million exclusively in the form of guarantees). The remaining available amount of € 509.4 million (2016: € 586.2 million) ensures the group's financial flexibility in the medium term. Any credit utilized is subject to interest at the customary market reference rates plus an additional margin. The unused amount of the revolving credit facility is subject to a loan commitment fee.

Finance lease liabilities

Finance lease liabilities represent obligations under finance lease arrangements that are capitalized and amortized using the effective interest method. For information on their accounting treatment and a summary of the corresponding capitalized lease assets, please refer to Part I of the Notes to the consolidated financial statements (Accounting policies and principles) and Note 15 (Property, plant and equipment).

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Financial liabilities arising from IAE-V2500 stake increase

The purchase price agreement signed by MTU in the financial year 2012 in order to increase its stake in the V2500 engine program by five percentage points to 16% made it necessary among other things to recognize a deferred financial liability contingent upon the number of flight hours performed over the next 15 years by the fleet of V2500 engines in service at the time of the stake increase. The nominal volume of this liability at December 31, 2017 was U.S. $ 437.9 million (2016: U.S. $ 489.2 million). This liability under contracts extending to mid-2027 is part of a hedging relationship in respect of revenues generated in U.S. dollars.

Financial liabilities arising from other program participations

The financial liabilities arising from other program participations mainly comprise financial liabilities arising from the acquisition of stakes in the GTF engine family, the PW800 and the GEnX, which in respect of their maturities have financing characteristics.

Capital expenditure

Capital expenditure in the reporting period relates to additions to intangible assets, property, plant and equipment, and financial assets:

Capital expenditure by class of asset

			Change 2017 - 2016	
in € million	2017	2016	in € million	in %
Intangible assets	114.8	115.4	–0.6	–0.5
Property, plant and equipment	196.7	159.4	37.3	23.4
Financial assets	189.6	104.8	84.8	80.9
Total capital expenditure	**501.1**	**379.6**	**121.5**	**32.0**

Capital expenditure on intangible assets

Capital expenditure on intangible assets relates to development costs incurred in the context of program partnerships in the OEM segment (commercial and military engine business), totaling € 92.4 million (2016: € 98.8 million). Detailed information on capital expenditure on intangible assets is provided in Note 14 to the consolidated financial statements (Intangible assets).

→ further information on page 198

Capital expenditure on property, plant and equipment

Additions in the 2017 financial year mainly comprise capital expenditure on equipment, operational and office equipment totaling € 90.8 million (2016: € 84.3 million) and advance payments and construction in progress amounting to € 84.5 million (2016: € 51.1 million) and relate to the expansion of production capacity at the MTU locations in Munich, Hannover and Rzeszów, Poland. Further information on capital expenditure on property, plant and equipment is provided in Note 15 to the consolidated financial statements (Property, plant and equipment).

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Capital expenditure on financial assets

Capital expenditure on financial assets in 2017 includes an amount of € 129.0 million (2016: € 54.3 million) relating to additions for companies accounted for using the equity method. The remaining amounts relate in particular to loans extended for aircraft financing. Further information on financial assets is provided in Note 16 to the consolidated financial statements (Financial assets).

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Liquidity analysis

Free cash flow
€ 151.1 million

One of MTU's key performance indicators is free cash flow, which it determines by combining its cash flow from operating activities with its cash flow from investing activities. Because the latter includes certain components (non-recurring cash outflows) that lie outside the control of operations management and do not form part of the group's core operating activities, corresponding adjustments are applied. The free cash flow of € 151.1 million (2016: € 82.0 million) from investing activities therefore excludes these non-recurring cash outflows, in the form of expenditure on stakes in engine programs amounting to € 10.1 million (2016: 5.8 million), payments related to interest-bearing loans in connection with aircraft and engine financing agreements amounting to € 45.9 million (2016: € 44.9 million), disinvestments of financial assets held for the purpose of liquidity management amounting to a negative adjustment of € 25.0 million (2016: € 12.7 million).

Consolidated cash flow statement (abridged)

			Change 2017 - 2016	
in € million	2017	2016	in € million	in %
Cash flow from operating activities	482.5	358.0	124.5	34.8
Cash flow from investing activities	–362.4	–314.0	–48.4	–15.4
+ Non-recurring cash outflows	31.0	38.0	–7.0	–18.4
Free cash flow	**151.1**	**82.0**	**69.1**	**84.3**
- Non-recurring cash outflows	–31.0	–38.0	7.0	18.4
Cash flow from financing activities	–332.9	223.3	–556.2	<-100
Translation differences	–3.5	2.0	–5.5	<-100
Change in cash and cash equivalents	**–216.3**	**269.3**	**–485.6**	**<-100**
Cash and cash equivalents at beginning of financial year	322.4	53.1		
Cash and cash equivalents at end of financial year	106.1	322.4		

Cash flow from operating activities

The cash inflow from operating activities in 2017 amounted to € 482.5 million, which was € 124.5 million (34.8%) higher than the 2016 figure of € 358.0 million. The main contributing factors to this positive result in 2017 were the strong growth in revenues and earnings, which significantly outweighed the amount of working capital tied up in production resources for the ramp-up of new programs, as well as strong business in the MRO segment.

Cash flow from investing activities

Consistently high investing activities

The cash outflow from investing activities in the financial year 2017 amounted to € 362.4 million (2016: € 314.0 million). Capital expenditure on intangible assets accounted for € 133.0 million (2016: € 108.1 million) of this amount, and mainly comprised development costs for the PW1000G family, GE9X and PW800 programs. Capital expenditure on property, plant and equipment, excluding the proceeds from disposals, amounted to € 188.1 million, compared with € 154.7 million in 2016. This increase is consistent with the expansion of MTU's production capacity for the ramp up of new programs. The net gain / loss on financial assets was mainly due to capital contributions in respect of equity investments and the extension of loans related to aircraft financing agreements.

Cash flow from financing activities

In the financial year 2017, MTU had a net cash outflow from financing activities of € 332.9 million (2016: a net cash inflow of € 223.3 million). This cash flow reversal results mainly from the scheduled repayment of the bond as described above under "Bonds and notes", totaling € 250.0 million, the increased dividend payment for the financial year 2016 amounting to € 97.6 million (for the financial year 2015: 86.9 million) and the settlement of purchase price liabilities related to shares in engine programs amounting to € 76.4 million (2016: € 79.2 million). A drawdown of € 77.9 million (2016: € 0.0 million) on the revolving credit facility as per the reporting date had a contrary effect.

Change in cash and cash equivalents

Despite the increased cash inflow from operating activities compared with 2016, which significantly exceeded the cash outflow from investing activities, repayment of the € 250.0 million bond led to a decrease in cash and cash equivalents of € 216.3 million (2016: increase of € 269.3 million).

Net assets

Total assets grew by € 204.9 million (3.5%) year on year to € 6,049.5 million (2016: € 5,844.6 million).

Changes in balance sheet items

MTU consolidated balance sheet

	Dec. 31, 2017		Dec. 31, 2016		Change 2017 - 2016	
in € million	in € million	in %	in € million	in %	in € million	in %
Assets						
Non-current assets						
Intangible assets and property, plant and equipment	3,053.5	50.5	2,915.7	49.9	137.8	4.7
Other assets	516.2	8.5	390.7	6.7	125.5	32.1
Total non-current assets	**3,569.7**	**59.0**	**3,306.4**	**56.6**	**263.3**	**8.0**
Current assets						
Inventories	997.9	16.5	1,022.7	17.5	–24.8	–2.4
Receivables, other assets and advance payments	1,375.8	22.7	1,193.1	20.4	182.7	15.3
Cash and cash equivalents	106.1	1.8	322.4	5.5	–216.3	–67.1
Total current assets	**2,479.8**	**41.0**	**2,538.2**	**43.4**	**–58.4**	**–2.3**
Total assets	**6,049.5**	**100.0**	**5,844.6**	**100.0**	**204.9**	**3.5**
Equity and liabilities						
Equity	**1,989.8**	**32.9**	**1,500.5**	**25.7**	**489.3**	**32.6**
Non-current debt						
Provisions	885.2	14.6	884.0	15.1	1.2	0.1
Liabilities	1,040.9	17.2	1,079.9	18.5	–39.0	–3.6
Total non-current debt	**1,926.1**	**31.8**	**1,963.9**	**33.6**	**–37.8**	**–1.9**
Current debt						
Provisions / Income tax liabilities	882.5	14.6	713.8	12.2	168.7	23.6
Liabilities	1,251.1	20.7	1,666.4	28.5	–415.3	–24.9
Total current debt	**2,133.6**	**35.3**	**2,380.2**	**40.7**	**–246.6**	**–10.4**
Total equity and liabilities	**6,049.5**	**100.0**	**5,844.6**	**100.0**	**204.9**	**3.5**

Assets

Intangible assets and property, plant and equipment increased by a total of € 137.8 million to € 3,053.5 million (2016: € 2,915.7 million).

In the financial year 2017, additions to intangible assets amounted to € 55.9 million (2016: € 20.2 million). This increase was mainly due to development costs in connection with engines from the GTF engine family and the PW800 and GE9X engine programs, which were offset by the corresponding scheduled amortization.

The increase in property, plant and equipment of € 81.9 million (2016: € 49.5 million) relates principally to capital expenditure on other equipment, operational and office equipment and construction in progress required in respect of the expansion of production capacities at MTU's locations in Germany and Poland.

The increase in other non-current assets was primarily attributable to the positive development of business and additional injections of capital to companies that are accounted for using the equity method in the group's consolidated financial statements. This was accompanied by an increase in the fair value of hedging instruments due to the effects of the U.S. dollar/euro exchange rate. With a view to reducing foreign exchange risks, a portfolio of U.S. dollar forward foreign exchange contracts was set up with a term to January 2020 and a nominal value of U.S. $ 1,580.0 million.

Within the carrying amount of inventories, inventories of raw materials and supplies decreased by € 35.7 million to € 371.6 million (2016: € 407.3 million), while finished products and work in progress increased by € 12.7 million to € 606.8 million (2016: € 594.1 million) and advance payments decreased by € 1.8 million to € 19.5 million (2016: € 21.3 million). Altogether, inventories accounted for 16.5% (2016: 17.5%) of net assets, a slightly lower proportion than that in 2016. The sales to inventory ratio was 5.0 (2016: 4.9).

The carrying amount of trade receivables increased to € 736.9 million (2016: € 692.1 million). Compared with the level at December 31, 2016, construction contract and service business receivables (based on percentage of completion), net of the corresponding advance payments received, increased by € 60.8 million to € 454.0 million. Other current assets include an amount of € 62.2 million (2016: € 54.0 million) consisting of payments recoverable from the tax authorities in respect of taxes.

Cash and cash equivalents decreased in particular as a result of the repayment of the bond in the reporting period. A convertible bond was issued in 2016. This item accounted for 1.8% (2016: 5.5%) of total assets at the reporting date.

Equity

Changes in equity

in € million	2017	2016
Group equity at January 1	**1,500.5**	**1,300.6**
Other comprehensive income		
Financial instruments designated as cash flow hedges	151.0	–1.6
Actuarial gains and losses on plan assets and pension obligations	12.8	–54.3
Translation differences arising from the financial statements of international entities	–9.7	–5.5
Net income	381.8	312.6
Dividend payment to shareholders of MTU Aero Engines AG	–97.6	–86.9
Equity portion of convertible bond [1]		16.0
Issue of treasury shares under the Restricted Stock Plan	3.6	5.1
Sale of treasury shares under the MAP employee stock option program	14.3	14.5
Non-controlling interest	33.1	
Total change in group equity	**489.3**	**199.9**
Group equity at December 31	**1,989.8**	**1,500.5**

[1] after deduction of transaction costs and taxes

Positive changes in equity
Positive changes in equity in 2017 principally included an amount of € 381.8 million attributable to net income (NI) (2016: € 312.6 million) and an amount of € 151.0 million as a result of the increase in the fair value of hedging instruments (2016: lower fair values in an amount of € 1.6 million).

Negative changes in equity
Negative changes in equity in 2017 mainly include an amount of € 97.6 million for the dividend payment to shareholders of MTU Aero Engines AG for the financial year 2016 (2016: dividend payment of € 86.9 million for the financial year 2015).

Liabilities

Among the items of non-current debt, non-current pension provisions decreased by € 13.0 million from € 860.6 million in 2016 to € 847.6 million in 2017. The main reason for this decrease is the change in the discount rate from 1.35% to 1.52% in 2017.

Non-current liabilities comprised non-current gross financial debt amounting to € 889.0 million (2016: € 982.1 million), other financial liabilities of € 47.6 million (2016: € 74.3 million), and deferred tax liabilities amounting to € 87.4 million at December 31, 2017 (2016: € 23.5 million). Non-current liabilities represented 31.8% of total liabilities at December 31, 2017, which is a slightly lower proportion to that in 2016.

The combined total of equity and non-current debt increased in the financial year 2016 by € 451.5 million to € 3,915.9 million (2016: € 3,464.4 million). This means that 109.7% (2016: 104.8%) of the company's non-current assets are financed through available, medium- to long-term funds.

The provisions recognized under current debt include pension provisions amounting to € 23.1 million (2016: € 22.7 million), which is close to the previous year's level, income tax liabilities, which decreased from € 6.8 million to € 3.6 million, and other provisions of € 855.8 million, which were € 171.5 million higher than in 2016. The increase in other provisions relates mainly to sales-related obligations in respect of losses arising from the settlement of accounts and warranty obligations. Current liabilities, which also form part of current debt, include trade payables amounting to € 562.8 million (2016: € 634.9 million), the balance of construction contract and service business payables after deduction of the corresponding receivables, amounting to € 321.9 million (2016: € 344.2 million), gross financial debt of € 197.9 million (2016: € 379.8 million) and sundry other identifiable obligations.

Equity ratio
32.9%

The debt to equity ratio increased year on year by 7.2 percentage points to 32.9% (2016: 25.7%).

Financial performance indicators and non-financial statement

Financial performance indicators

The original forecasts for EBIT adjusted and net income adjusted were updated in the half-year report and specified as being around € 560 million and € 390 million respectively. The revenue forecast was increased to approximately € 5,300 million, particularly in view of the continued favorable development of the U.S. dollar exchange rate.

At the time of the third-quarter report, there were indications that earnings would improve still further. As a consequence, while the revenue forecast was revised downward slightly to € 5,100 million, the EBIT adjusted forecast was raised by € 40 million to € 600 million and that for net income by € 30 million to € 420 million.

Forecast and actual results

in € million	Actual 2017	Forecast 2017 dated October 26, 2017	Forecast 2017 dated July 28, 2017	Forecast 2017 dated February 23, 2017	Actual 2016	Change 2017 - 2016 in %
Revenues	5,036.3	approx. 5,100	approx. 5,300	approx. 5,100 - 5,200	4,732.7	6.4
Adjusted earnings before interest and tax (EBIT adjusted)	606.6	approx. 600	approx. 560	stable adjusted EBIT margin	503.0	20.6
Net income adjusted	429.1	approx. 420	approx. 390	Stronger growth than EBIT adjusted	345.4	24.2

Revenue forecast

On February 23, 2017, the Executive Board forecast that revenues in 2017 would increase to between € 5,100 million and € 5,200 million (actual 2016: € 4,732.7 million). In the half-year report published on July 28, 2017, this forecast was specified at € 5,300 million. In response to the weaker U.S. dollar, the revenue forecast was again revised downward to € 5,100 million on publication of the figures for the third quarter on October 26, 2017. At year end, revenues amounted to € 5,036.3 million, which is slightly lower than the forecast figure of € 5,100 million. In the commercial OEM business, revenues in U.S. dollar terms fell short of expectations. The reason for this was changes in the engine portfolio mix in connection with the PW1100G-JM program. Due to a contraction of MRO activities combined with lower spare parts sales, revenues in the military engine business were lower than had been forecast. By contrast, in the MRO segment revenues in U.S. dollar terms showed a better year-on-year improvement than expected.

Earnings forecast (EBIT adjusted)

MTU's initial forecast for EBIT adjusted was that it should correspond to a stable EBIT adjusted margin. On July 28, 2017, the group issued a more concrete forecast of approximately € 560 million. This forecast was revised upward on October 26, 2017, to € 600 million, in light of the third-quarter results showing a further improvement in the company's business prospects. Year-end EBIT adjusted amounted to € 606.6 million, thus confirming the revised forecast.

Earnings forecast (net income adjusted)

Net income exceeded forecast

The Executive Board initially forecast that net income adjusted in 2017 would grow at a higher rate than EBIT adjusted. A more concrete forecast was issued on July 28, 2017, predicting a year-end result of approximately € 390 million. This forecast was revised upward to € 420 million on October 26, 2017, in line with the corresponding increase in the forecast for operating profit (EBIT adjusted). At December 31, 2017, net income adjusted amounted to € 429.1 million, which is slightly higher than the predicted result.

Free cash flow

As in 2016, MTU's expectations were that 2017 would be a year of substantial capital expenditure, and that the amount of advance payments in the military business would fall still further, but that these debit items would be balanced by improved operating results. Based on these assumptions, the Executive Board's forecast for free cash flow issued on February 23, 2017, was that the ratio between free cash flow and net income adjusted would lie in the low double-digit percentage range. A revised, more concrete forecast of € 120.0 million was issued on July 28, 2017, when the half-year interim report was published. In the interim report for the third quarter published on October 26, 2017, this forecast was revised upward to approximately € 140 million based on the excellent quarterly results. This target was exceeded at December 31, 2017, with a free cash flow of € 151.0 million.

Overall assessment of business performance in 2017

MTU renews record performance

2017 was yet another record-breaking year for MTU. Revenues increased to € 5,036.3 million, which is 6.4% higher than in the previous year (2016: € 4,732.7 million).

The main revenue driver in 2017 was the MRO segment (commercial maintenance business), which posted an increase in revenues of 19.4%, whereas the contribution to revenues by the OEM segment (commercial and military engine business) remained mostly stable.

2017 was yet another year of intensive capital expenditure for MTU, with the company continuing to invest in commercial engine development across all thrust classes and building up its production capacity at locations in Germany and abroad.

MTU's operating profit reached a new record high in 2017, boosted in particular by the strong growth in the MRO segment and a favorable product mix in the OEM segment. EBIT adjusted amounted to € 606.6 million (2016: € 503.0 million), while the EBIT margin rose to 12.0% (2016: 10.6%).

The free cash flow results were equally gratifying, rising to € 151.0 million (2016: € 82.0 million) despite major capital expenditure on the development of new programs and the locations in Germany and abroad, as well as a decrease in advance payments in the military engine business.

The forecasts issued at the beginning of the year, which were later revised upward, were thus not only achieved but in most cases surpassed.

Revenues from commercial spare parts and commercial maintenance business exceeded the forecasts made at the beginning of the year. These results more than compensated for the effect of delays in the commercial engine business and a decline in the military business, leading to higher earnings than expected.

Non-financial statement

The present MTU Aero Engines non-financial statement provides information on important non-financial topics for the 2017 financial year. This is a condensed non-financial statement in accordance with Sections 289b et seq. and Sections 315b et seq. of the German Commercial Code (HGB), which contains disclosures relating to MTU Aero Engines AG as the parent undertaking as well as information relating to the MTU group. The group structure is described in the section headed "The enterprise MTU" of the combined management report. In addition, each summer the company publishes a separate sustainability report for the previous financial year in accordance with the international G4 standards of the Global Reporting Initiative (GRI).

Business model

The enterprise MTU and the business model are described in the Combined management report in the section "The enterprise MTU" of this combined management report.

→ further information on page 60 et seq.

Framework

The key topics for the non-financial statement were identified by the corporate responsibility (CR) coordinators in the relevant departments, in collaboration with the CR steering committee. For this, the topics were evaluated in a structured process in accordance with the definition of materiality pursuant to Section 289c of the German Commercial Code (HGB). The sustainability topics that MTU deemed to be relevant for the company and its stakeholders in accordance with the GRI materiality criteria served as the starting point. For this report, MTU evaluated the social, environmental and economic impacts of these topics. Criteria included, for instance, regulation by the legislator, requirements of stakeholder groups, or activities within the industry. Twelve key topics emerged from this analysis, which, in accordance with the German CSR Directive Implementation Act (CSR-RUG), were subsequently examined in more depth to determine their relevance for the success of MTU's business. Pursuant to the German CSR Directive Implementation Act (CSR-RUG), relevance for the success of the business relates to the understanding of the company's business performance, operating results and position. The criteria applied by MTU for assessing business relevance covered such aspects as the impact on the company's reputation or on the income statement. As a result, eight topics were identified as relevant for inclusion in the present non-financial statement. These encompass the additional aspect "Product quality and flight safety". Statements relating to the environmental aspect can be found under "Eco-efficient engines". The Executive Board and Supervisory Board were kept regularly informed about the materiality process.

Corporate citizenship, supplier management and $C0_2$ emissions in production were rated in this process as not relevant for inclusion in the non-financial statement. MTU's management approaches for these topics are reported on in MTU's Sustainability Report.

Within the context of opportunity and risk management, MTU also considers non-financial risks – and consequently the topics covered in the present statement. For the topic Compliance, MTU has established a separate risk assessment and a separate reporting line, coordinated by the Compliance Board. The eight topics included in the non-financial statement have been examined by the CR coordinators in the relevant departments and the CR steering committee for possible risks to the environment, society and the company's employees deriving from MTU's business activities. The risk assessment builds on the existing risk management system and was carried out by analogy with the described opportunity and risk process on a scale referencing the likelihood of occurrence and the impact of the risk. The analysis of the CR divisional coordinators and the CR steering committee did not give rise to any significant risks with a high likelihood of having a severe negative impact on the identified non-financial topics.

Due to the materiality concept of the German CSR Directive Implementation Act (relevant non-financial information for the business performance, operating results and position of the group as well as the impacts of its business activities on the aspects environment, employee, social issues, human rights and anti-corruption), which differs from the GRI guidelines, MTU did not apply any standard as a general framework when preparing the non-financial statement. Rather, for its non-financial statement, MTU builds on its established sustainability strategy in compliance with the internationally applicable Global Reporting Initiative G4 standard (“Core” option), as presented in its Sustainability Report.

Product quality and flight safety

Additional aspect pursuant to new CSR legislation (German CSR Directive Implementation Act - CSR-RUG)

Quality and safety are of paramount importance in aviation and the corresponding framework conditions are strictly regulated. Legal requirements concerning the safe operation of flights are closely monitored by the aviation authorities. This is mirrored in the high importance MTU places on product quality and flight safety. The company must comply with the legal requirements imposed upon it as a development, manufacturing and maintenance organization in the aviation industry. MTU continuously evaluates the approval requirements for its business activities in order to obtain or keep the requisite aviation-authority licenses, approvals and certifications.

Prioritizing safety

A group-wide integrated management system (IMS) ensures compliance with laws and internal regulations and clear assignment of responsibilities within the company. One principle of the IMS policy is that “Safety takes priority in what we do.” The quality framework is enshrined in a management manual that is binding for all employees and managers across the group. Corporate Quality is a separate department directly subordinate to the Chief Operating Officer (COO) and reports quarterly to the Executive Board on quality aspects and flight-related incidents. MTU Safety Management in accordance with the International Civil Aviation Organization (ICAO) standard is part of the IMS and defines how to handle safety-related air-traffic events. Appropriate organizational structures and responsibilities, such as a Flight Safety Board and a flight safety manager, have also been established. High quality standards together with product safety and reliability are enshrined in the MTU Principles as an important corporate objective.

Product compliance

The strict regulatory framework requires MTU to comply with stringent quality and safety requirements throughout the entire product lifecycle of an engine. MTU has therefore implemented processes designed to meet these requirements. For example, the aviation sector has strict rules governing documentation in order to verify the airworthiness of components and engines. There must be no gaps in documentation for the entire product lifecycle. MTU also imposes the industry-specific requirements on its suppliers.

To ensure compliance with quality and safety requirements, MTU has implemented comprehensive monitoring and testing processes throughout the entire value chain. Components classified as safety-critical undergo particularly thorough tests to verify their technical quality.

The effectiveness of MTU’s IMS is certified by independent and accredited external auditors.

Focus on customer satisfaction

Delivering products and services in the required quality and increasing customer satisfaction was one of the corporate objectives for 2017. MTU continuously monitors quality standards and, where necessary, initiates appropriate measures to achieve long-term sustainable improvements. Providing customers and partners with safe and top-quality products and services helps to keep MTU's business competitive. In 2017, the goal was to lower or at least keep the number of customer complaints stable at all locations. In order to ensure uniformly high standards and conformity to legal requirements, MTU routinely conducts internal and external audits. These audits are managed locally by the respective sites.

A defined process ensures that all customer complaints relating to sub-standard quality of delivered MTU products are followed up and analyzed, and appropriate measures are defined and implemented so as to eliminate the cause of the defects. In maintenance operations, too, a procedure is in place for examining customer complaints using quality methods in order to eliminate the root causes permanently. Success of these measures is closely monitored. A cross-divisional CI project (CI = Continuous Improvement) carried out at the Munich location in 2017 systematically analyzed complaints by key accounts from the two previous years for causes of failure, and initiated appropriate measures to eliminate them.

Customer complaints are evaluated at the individual MTU sites, and for the majority of locations declined compared with 2016. In the reporting period, 410 internal audits including certification audits (254 at the Munich location) and 96 external quality audits by customers or aviation authorities (28 at the Munich location) were conducted.

Continuous improvement

Quality control at MTU is undergoing continuous development. Impetus for this comes, for example, from collaboration in the Aero Engine Supplier Quality Group or from regular meetings of the quality managers. Furthermore, the framework of rules is continuously revised. Several times a year, the company publishes its quality information, Q-Info, group-wide on the intranet, aimed at raising awareness among employees. At MTU's principal maintenance site in Hannover, this is supplemented by the site-specific QM-Info. MTU also provides training on quality issues for managers and employees at the individual sites. Shopfloor/office management in Germany and Poland, where employees and managers exchange views on quality and other issues several times a week and initiate short-term measures if problems arise, also supports continuous improvement. Shopfloor/office management was also rolled out at MTU's Vancouver location in Canada in 2017.

Eco-efficient engines

Environmental aspect in accordance with the German CSR Directive Implementation Act (CSR-RUG)

MTU is working on solutions to make flying more environmentally friendly, with a focus on reducing fuel consumption, CO_2 emissions and noise emissions of engines – factors it can directly influence with its high-pressure compressors and low-pressure turbines. This commitment is contained in the MTU Principles under the maxim of sustainable product development with reduced fuel consumption and noise emissions. There is a direct link between fuel consumption and CO_2 emissions. Because CO_2 emissions are a contributing factor to climate change caused by aviation, MTU is working on solutions to make engines more fuel-efficient. The MTU code of conduct also contains guidelines on product development according to environmental criteria. MTU also contributes to the European industry and research sector's Strategic Research and Innovation Agenda (SRIA) and supports its targets to reduce its impact on the environment.

An Innovation Board regularly discusses all topics related to technology and innovation and initiates technology projects and studies. The Technology steering committee, of which the Chief Operating and Chief Program Officers are members, approves MTU's technology roadmap and is regularly updated on progress.

MTU manages its short- to long-term product development in a multi-level technology and innovation process. Short-term product development is oriented toward concrete customer specifications on the basis of existing technologies; in the medium term (up to 15 years), advanced product designs are created from which technology requirements are derived and long term (up to 2050), a technology radar is used to develop pilot concepts and initiate enabling technologies. Product and technology development is concentrated at the Munich location, with some activities being carried out at the individual MTU sites in Hannover, Ludwigsfelde and Rzeszów.

Precautionary principle in addressing environmental protection

Air traffic, and therefore MTU's products, has an impact on climate change, the use of resources and noise emissions affecting people who live in close proximity to airports. MTU is committed to the principle of integrated environmental protection, which takes a precautionary approach to how the company's products impact the environment, and integrates insights from this into entrepreneurial decisions. MTU's technology and innovation process incorporates environmental and societal driving forces for aviation and takes them into account when defining its own concepts and targets. The company identifies negative impacts of air traffic on the environment and on society for instance by

- Participating in various discussion forums, for example run by the German Aviation Association (BDL), Friends of the Earth Germany (BUND), Greenpeace, Munich Airport
- Giving consideration to new scientific insights, for example research findings of the Intergovernmental Panel on Climate Change concerning the impact of aviation on climate change
- Working on committees such as the German Aerospace Industries Association (BDLI) or the Advisory Council for Aviation Research in Europe

MTU's Clean Air Engine Agenda

The aviation industry is characterized by long product cycles, with aircraft engines as a rule spending 30 years in service before they are decommissioned. Goals to produce more eco-efficient engines therefore have a long-term perspective and are established in memoranda of understanding by the aviation stakeholders (airlines, aviation industry, research, aviation authorities). In Europe, goals aimed at cutting fuel consumption as well as CO_2 and noise emissions are defined in the SRIA, which forms the basis for all national and European technology programs as well as for the MTU Clean Air Engine Agenda (CLAIRE). With this Clean Air Engine Agenda, MTU has initiated its own eco-efficiency targets through to 2050 (change compared with an engine from the year 2000, per passenger kilometer), which follow the SRIA goals. The next MTU goal is set for 2030 and intends to reduce the carbon footprint of future engines by 25 percent and noise emissions by 50 percent.

Implementation of the Clean Air Engine Agenda 2030 is based on the Geared Turbofan™, a new type of engine co-developed by MTU in collaboration with Pratt & Whitney. In the next generation, this engine will be refined into an ultra-high bypass engine with higher bypass ratios, pressure ratios and temperatures, with the aim to lower CO_2 and noise emissions. MTU is already working on the preliminary design of this engine.

MTU develops the requisite technologies for this generation of engines, such as integrated compression and expansion systems or high-temperature lightweight materials, within the national aviation research program LuFo and European technology programs. These technologies are being further developed in collaboration with partners in initiatives such as the Clean Sky technology program, until they are mature enough to be applied in product development. Furthermore, MTU actively promotes efforts to spread the use of sustainable fuels with low carbon content through the Aviation Initiative for Renewable Energy in Germany (aireg e.V.).

Due to the long-term approach to improving the aviation industry's environmental performance, no annual targets are set for eco-efficient engines or corresponding performance indicators collected. Several European technology programs in which MTU was involved, Clean Sky 1, E-BREAK, and LEMCOTEC, were completed at the end of 2017. With the new technologies derived from LEMCOTEC, E-BREAK and ENOVAL, the European engine industry has achieved the SRIA target for 2020 with respect to fuel and CO_2 reduction. The SRIA goal for 2020 for cutting flight noise has not yet been achieved.

MTU implemented the following milestones with respect to its Clean Air Engine Agenda 2030 in the financial year 2017:

Fuel/CO_2

- Certification of the PW1919G, PW1921G, PW1922G and PW1923G models for the Embraer E190-E2 and E195-E2 and the PW1217G model for the Mitsubishi MRJ regional jet

  These models all belong to the PW1000G Geared Turbofan™ engine family, which, according to information and calculations supplied by OEM Pratt & Whitney, reduces fuel consumption on average by 16 %. Aircraft manufacturer Embraer claims that the fuel consumption of the E190-E2 is improved by as much as 17 %.

- Initial test of a demonstration engine for high-temperature materials within the scope of Clean Sky 2
- Laying of the foundation stone for a new test center in Munich for critical components with high-performance spin test stand
- Continuous development of light and thermally stable materials within the MTU technology roadmap

Noise:

- Certification of the PW1919G, PW1921G, PW1922G and PW1923G models for the Embraer E190-E2 and E195-E2 and the PW1217G model for the Mitsubishi MRJ regional jet

  According to information and calculations supplied by OEM Pratt & Whitney, the noise footprint of the PW1000G Geared Turbofan™ engine family, which includes these models, is reduced on average by up to 75 % (spread of aircraft noise near airports). In other words, the noise emissions are on average 15-20 dB below the current legally stipulated noise emission class (ICAO Stage 4)

- Incorporation of a new turbine exhaust case with integrated acoustic linings into the low-pressure turbine and testing in TU Stuttgart's altitude wind tunnel, as part of an ongoing design project

Prevention of corruption and bribery aspect in accordance with the German CSR Directive Implementation Act (CSR-RUG)

Prevention of corruption and bribery

MTU condemns corruption of any kind, including bribery and all other forms of white-collar crime. The long-term success of any business is founded on compliance with applicable laws and regulations and the company's own internal guidelines. An enterprise-wide framework of compliance rules obliges employees and management to act with responsibility and integrity. These obligations include adhering to statutory requirements and internal regulations. The MTU Principles help MTU to act in a consistent and reliable manner and make compliance with the code of conduct and ethical principles mandatory. Group-wide guidelines also provide clear rules for day-to-day dealings with officials and when it is appropriate to accept business-related invitations and gifts. Further internal regulations concerning the prevention of corruption relate to invitations, hospitality, customer events, donations and sponsoring and the approval process for sales consultants.

As the final decision-making authority, the CEO is responsible for the company's business ethics and anti-corruption policy. One of the key tools for ensuring the ethical conduct of business activities is the central Compliance Board at management level. The Compliance Board holds both regular and ad hoc meetings and provides quarterly updates on its activities to the Executive Board and the Supervisory Board's Audit Committee, which for its part informs the plenary meetings of the Supervisory Board.

The Audit Committee oversees the Executive Board's compliance activities. Employee representatives make up half of the members of the Supervisory Board's Audit Committee and of the full Supervisory Board. The company has instituted a global whistleblower system that allows employees and external stakeholders to report suspected cases of corruption or bribery to an ombudsman. The Compliance Board initiates appropriate action if such suspicions are confirmed.

MTU's goal is to prevent any possible forms of misconduct across the group (principle of zero tolerance). In the 2017 reporting period no suspected or confirmed cases of corruption were identified.

Memberships

MTU conducts audits according to the German generally accepted auditing standards promulgated by the Institute of Public Auditors in Germany (IDW Auditing Standards). MTU moreover applies international compliance standards such as the Good Practice Guidance on Internal Controls, Ethics, and Compliance issued by the Organization for Economic Cooperation and Development (OECD), and is also represented in the following anti-corruption initiatives:

- Activities of the Aerospace and Defense Industries Association of Europe
- UN Global Compact
- TRACE International

Compliance risks and assessments

To ensure sound and reliable business relationships, the Compliance Board inspects sales support consulting contracts for possible corruption risks before they are placed or renewed. The potential consultants are also reviewed by an independent provider of due diligence services. The corporate audit department conducts regular compliance audits in which it checks business processes and procedures for conformity to legal requirements and adherence to internal guidelines. The Supervisory Board's Audit Committee reviews the framework of compliance rules and deliberates on the measures and employee training recommended by the Compliance Board.

Raising awareness for compliance issues is done first and foremost by organizing mandatory anti-corruption training courses for managers and employees who hold positions of trust, which were also held in 2017. Monitoring is mainly carried out by the Compliance Board. MTU also constantly endeavors to improve its compliance system. To this end, the company reviewed its compliance system in 2017. Recommended measures for improvement, such as a new compliance reporting system, enhancement of the whistleblower system and organizational changes in the structure of compliance responsibilities, are implemented successively.

Occupational safety

Employees aspect in accordance with the German CSR Directive Implementation Act (CSR-RUG)

MTU places a great deal of importance on the safety of its employees. Occupational safety and employee health are enshrined as one of the key principles of corporate social responsibility in MTU's code of conduct. Compliance with national statutory regulations on occupational safety is embedded in the code of conduct as a mandatory minimum standard for all international MTU subsidiaries. In addition, MTU has set up an internal standard that lays down generally valid parameters, rules and performance indicator definitions. A quarterly group report is submitted to the Executive Board. Occupational safety is organized and implemented at operational level within MTU at the individual locations: occupational safety is the responsibility of the site managers and occupational safety officers are appointed at management level at each of the company's production sites. Local technical departments take action on occupational safety issues on site and report regularly to the site management. The workforce at the company's production sites in Germany, Poland and Canada is represented in locally organized occupational safety committees, the composition of which includes members of the works council.

Occupational safety forms part of MTU's IMS policy (integrated management system). The occupational safety systems are regularly reviewed and improved. At each of the European production sites, workplace regulations that are mandatory for all employees contain important safety rules pertaining to accident prevention, fire protection and what to do in the event of workplace or commuting accidents.

MTU strives to minimize health and safety risks to its employees and third parties as far as possible, whilst also seeking to make continuous improvements. Workplaces are regularly assessed for any risks and hazards they present for employees so that appropriate measures can be implemented where necessary. With the aim to permanently reduce the number of accidents and reach a level of safety that aspires to prevent any accidents whatsoever, the local occupational safety officers record all accidents according to uniform criteria and investigate them together with the affected employees and their managers. Where the analysis reveals notable accident hotspots, the causes are investigated and appropriate steps taken to prevent a recurrence. In addition, the company has a system in place to record and evaluate near-misses at all production sites. MTU's occupational safety systems include regular safety training for all employees and the appointment of trained first-aiders. The local technical departments are continually carrying out prevention work at the company's sites through training sessions and information on occupational safety issues.

The occupational safety systems in place at the German production sites are certified externally in accordance with the international Occupational Health and Safety Assessment Series (OHSAS) 18001 standard.

Occupational safety as a corporate objective

High standards in occupational safety across the group are one of the company's annual corporate objectives. For each location, annual tolerance thresholds are set for category 4 reportable workplace accidents (accidents that entail more than three days lost). MTU's comprehensive occupational safety systems reach a level of safety that produces a group-wide accident rate for 2017 of 3.7 reportable workplace accidents per 1,000 employees, which is significantly below the average for the German metal-working industry (Wood and Metal Trade Association – BG Holz und Metall) of 37 accidents per 1,000 employees. MTU's accident statistics for 2017 showed a positive trend, with a decrease in accident numbers at almost all locations. For the group as a whole, the number of reportable workplace accidents entailing more than three days lost was 33 in 2017, compared with 43 in 2016. The equivalent number of reportable accidents for MTU Aero Engines AG was 17 in 2017, compared with 24 in 2016. There were no fatal workplace accidents in 2017 or in 2016. The accident statistics relate to the total workforce, including trainees/apprentices, interns, pupils and students, and employees on fixed-term contracts (excluding temporary agency workers and employees from external companies).

Occupational safety initiatives in 2017

Occupational safety takes account of the conditions prevailing at the individual business locations. Proactive measures are initiated based on regularly updated risk assessments as well as routine inspections and audits by technical production and office staff.

The following measures were implemented at the MTU locations in 2017:

- At the end of 2017, a "mission zero" campaign designed to achieve improvements in areas such as occupational safety was launched with the vision to aspire to a level of safety of zero accidents; for example, further development of MTU's occupational safety culture through an information film on various issues such as the safe use of tools (Munich)
- Regarding the assessment to determine where the company stands in terms of enhancing the safety culture, MTU has concluded an agreement with the senior management in Hannover and is planning the rollout at team level for the first half-year 2018. The agreement focuses on occupational safety as a management responsibility, personal responsibility of MTU employees and the conditions for the continuous enhancement of the safety culture, such as weak point analysis. To this end, a Safety steering committee at senior management level is to be set up to monitor quantitative and qualitative effectiveness
- Extensive inspection of personal protective gear (Ludwigsfelde, Hannover)

- Introduction of daily inspections in production for safety aspects such as the wearing of protective gear (Rzeszów)
- Crew briefings, ranging from short analyses following an accident or on new occupational safety regulations, to workshops lasting several hours (Vancouver)

Employee development

Employees aspect in accordance with the German CSR Directive Implementation Act (CSR-RUG)

Qualified and motivated employees are indispensable for driving innovation and ensuring competitiveness in the technically demanding aviation industry. In many areas in which MTU is active, aviation authorities additionally prescribe qualification measures, such as mandatory training in human factors (importance of human factors and how they affect safety in air transport) or for employees with certification authorizations under aviation legislation. In addition to industry-specific vocational training, such as aircraft maintenance engineer, and dual courses of study aimed at building up knowledge over the long term, MTU supports and promotes employee training – this is a key principle of corporate social responsibility defined in the company's code of conduct. Promoting vocational training opportunities and avenues for personal development for employees and managers is also enshrined in the MTU Principles and group-wide HR strategy. The head of human resources is responsible for the training and development of employees group-wide. The Executive Board is kept informed about training indicators once a year through the education and training report, and occasionally discusses important training initiatives.

The great importance placed on training and development is reflected in a group-wide works agreement in Germany that guarantees access to training for all employees and requires management to conduct an interview with each employee once a year to discuss their training and development. At MTU's three sites in Germany, the works council is also involved in employee training in accordance with the German Works Constitution Act (Betriebsverfassungsgesetz) and has a say in the annual training and development program.

Lifelong learning

Employee development and lifelong learning help employees hone and develop their skills. Employees' training requirements are systematically reviewed on an annual basis. To this end, the training requirements of the workforce are established in a standard process either in a direct conversation (training interview) or in divisional / company-level interviews. After completion, training courses are evaluated in a personal meeting between the employee and their superior, or in some cases via a feedback form. Completed training and development courses are documented for each employee in a training history. Training officers at all MTU sites can be consulted at any time for advice on needs-focused training. To put employee development on a more future-oriented footing, a new e-learning portal has been set up for all employees in Germany that makes access to training more mobile and more readily available to employees.

Strengthening leadership

MTU attaches great importance to strengthening the personal and professional competencies of all employees on an ongoing basis. Key areas of focus in 2017 were consolidating leadership responsibility and promoting internationalization and diversity in the workforce. This was also one of MTU's corporate objectives in 2017.

Through effective leadership, managers help to empower employees and also contribute to the successful management of MTU. One of the focuses of MTU's employee development is therefore to support managers in their important role through targeted measures. With this in mind, MTU has continued with its Business Challenge qualification initiative which specifically addresses managers and is designed to promote a culture of communication and encourage a holistic and sustainable change in corporate thinking across all levels of management and all locations. Within the scope of the Business Challenge (BC) training program, MTU has placed the emphasis on leadership in the form of the BC II follow-up initiative, with the aim to promote consistent leadership practices and a culture of feedback and dialog, as well as making leadership more efficient. The 2017 reporting year saw an additional series of presentations in Munich under the heading "Business Challenge to go" on current topics such as the design thinking method, which were attended by managers from all levels. At the Hannover location, for example, leadership skills are strengthened in the context of the leadership initiative. Events were held for all levels (including foremen) in 2017 covering topics such as "Top performance and motivation" or "Management and leadership".

An International Leadership Program (ILP) has been established group-wide and, in addition to strengthening personal leadership skills, is intended to promote networking between managers across all sites as the basis for a common understanding of leadership in a global business environment. The program is open to members of the extended management with potential for the next management level. With events held at the sites in Vancouver, Rzeszów and Munich in 2017, the ILP program helped to promote an exchange across multiple countries and locations. Managers from seven locations took part.

Diversity and equal opportunities

Employees aspect in accordance with the German CSR Directive Implementation Act (CSR-RUG)

MTU is actively committed to equality of opportunity and equal treatment of all employees and takes a clear stand against discrimination at the workplace. These are the principles underpinning MTU's corporate behavior and that are set out in its code of conduct. MTU endeavors to deploy and support all employees in accordance with their skills, abilities and performance. Everyone has the same opportunities regardless of their gender, ethnic origin, age, religion, disability or sexual orientation. Promoting diversity is a key component of the corporate culture and business success that is enshrined in the MTU Principles. MTU firmly believes that a diverse workforce bolsters a company's innovative capabilities and competitiveness and views fostering female talent and equal participation of women in management as its greatest innovation potential. The company sees broad scope for action here, above all in Germany. The Executive Board is kept regularly informed about the diversity concept with respect to the promotion of women and measures that have been initiated and implemented. Furthermore, the Executive Board presents a report on equality at the works meeting once a year. In Germany, the works council is involved in decisions subject to co-determination, such as flexible working time rules.

MTU commits to diversity and equality of opportunity in the following external initiatives:

- Charter of Diversity
- UN Global Compact
- Munich Memorandum for Women in Management

To ensure diversity and equal opportunity within the company as well as to prevent discrimination, MTU espouses a corporate culture based on respect and appreciation that promotes fair and cooperative conduct. Processes are implemented to allow breaches of the code of conduct or of internal guidelines to be reported. Employees group-wide who suspect breaches of the code of conduct can contact an ombudsman confidentially. Managers, the works council and members of the human resources department are also designated as persons of trust in this context.

Information on dealing with discrimination in connection with human rights can be found in section "Respecting human rights" in this non-financial statement.

Women in management

Promoting a diverse and international workforce is one of the company's overarching corporate objectives. MTU attaches particular importance in this context to gender diversity in order to make better use of talent potential in the face of demographic change and better position the company for the future. One important goal is therefore to increase the proportion of women in management positions at the German sites to 13 percent by 2022 for all management levels except Executive Board level.

The principal focus of the initiatives worldwide and especially in Germany is to secure more female talent for the company and offer female employees greater support throughout their careers. The initiatives are elaborated and implemented at the individual locations. MTU has been focusing on getting more women into management since 2003, for example through the Cross-Mentoring program organized by the City of Munich, in which high-potential female employees are supported for a year by a mentor from another company, and MTU managers also become involved as mentors. MTU also promotes initiatives to improve employees' work-life balance, including flexible working hours, services to assist families and mobile working.

For MTU, the number of female new hires and the proportion of women among high-potential candidates at the Development Center (DC) provide an indicator of where changes are emerging. By means of training exercises and interviews, the Development Center in Germany and Poland helps female talent draw up a personal development plan to assume a management function in the short term. At the end of 2017, the proportion of female participants at the DC was 11.9 % (16.1 % AG) and of female new hires in Germany 16.9 % (26.7 % AG).

The proportion of women in management positions in 2017 was 10.3% for the group (2016: 10.7%), 9.7% at the German locations (2016 : 10.1%) and 10.3% for MTU Aero Engines AG (2016: 10.7%). The slight drop compared with the previous year is within normal year-to-year fluctuations. MTU does not believe this will jeopardize achieving the target for the proportion of women in management at its German locations. The proportion of women in the workforce in 2017 was 14.1% for the group, compared with 14.0% in 2016, while the proportion at the German locations remained unchanged at 13.9%, and the proportion of women at MTU Aero Engine AG increased slightly in 2017 to 15.5% (2016: 15.2%). The given proportions of women are based on the active workforce (employees with permanent or fixed-term contracts, excluding students, interns, trainees/apprentices, short-term holiday workers, temporary agency workers and employees from external companies).

In 2017, MTU was recognized by the Women's Career Index, taking third place in the "Newcomer of the Year" category. The Women's Career Index is an external tool for evaluating career opportunities for women in business enterprises.

Respecting human rights aspect in accordance with the German CSR Directive Implementation Act (CSR-RUG)

Respecting human rights

MTU respects the internationally proclaimed human rights set out in the United Nations' Universal Declaration of Human Rights and enforces and protects these rights within the company. For the non-financial statement, MTU focuses on human rights pertaining to the company's own employees. MTU pursues the goal to prevent human rights violations occurring in its own business activities (zero-tolerance principle).

MTU is committed to respecting the individuality and dignity of all, maintaining equality of opportunity in the workplace and preventing discrimination. The protection of human rights, the right to appropriate remuneration, as well as recognition of regulations governing employee and union representation under labor and works constitution law, are implemented group-wide through the code of conduct. As an employer, MTU aims to create fair working conditions based on legally binding employment contracts with appropriate remuneration. This includes the right to unionize and to adopt collective agreements. Compliance with the code of conduct and ethical principles is enshrined in the MTU Principles. The commitment to respecting human rights is reinforced by MTU's status as a signatory to the UN Global Compact and by national legislation that upholds human rights.

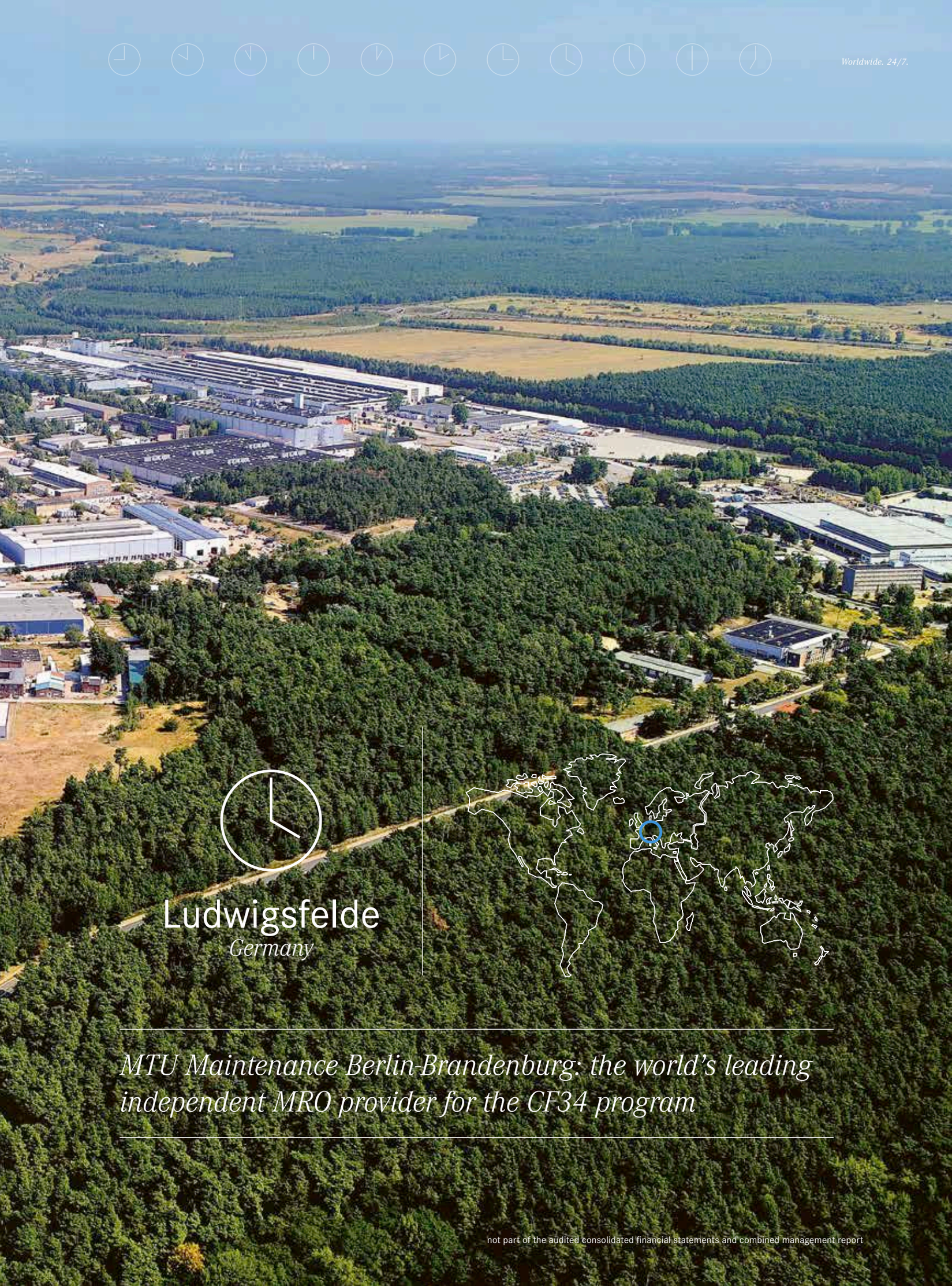
In Germany, MTU is bound by the General Act on Equal Treatment (AGG), which prohibits discrimination against employees and job applicants. For employees in Germany, there are also internal guidelines on fair and cooperative conduct that are designed to prevent bullying, sexual harassment and discrimination.

Established reporting procedures ensure that MTU follows up all complaints or reports of human rights infringements. The group-wide processes in place for dealing with such cases are described in the section on diversity and equal opportunities. In line with the provisions of the General Act on Equal Treatment (AGG), every site in Germany has a designated contact who is appropriately trained, to whom employees can address any complaints of discrimination. Employees can also report complaints to managers, the works council or the head of human resources. The Executive Board is informed about infringements depending of the severity of their impacts.

When they join the company, new employees are informed about the regulations laid down in the code of conduct and – in Germany – in the General Act on Equal Treatment (AGG), and they undertake to comply with these requirements. In addition, MTU provides regular training on the code of conduct at all the company's sites and across all hierarchical levels.

At the German sites, there was one complaint under the General Act on Equal Treatment (AGG) in 2017. This complaint was followed up and appropriate action taken.

Other than this, there were no justified breaches of the code of conduct within the MTU group.



Ludwigsfelde
Germany

MTU Maintenance Berlin-Brandenburg: the world's leading independent MRO provider for the CF34 program

Ludwigsfelde
Germany

MTU Maintenance Berlin-Brandenburg: the world's leading independent MRO provider for the CF34 program

LUDWIGSFELDE LOCATION

MTU Maintenance Berlin-Brandenburg GmbH with currently around 780 employees is located in Ludwigsfelde.

The MTU site specializes in the maintenance of aircraft engines in the lower-to-medium thrust and power range, as well as industrial gas turbines.

It's 4 p.m. at MTU's Ludwigsfelde location in Brandenburg. The technicians are in the middle of overhauling a CF34 engine. Almost 1.7 metric tons is resting on the assembly support frame. With painstaking precision, MTU's engineers dismantle the engine and inspect each part thoroughly, where necessary repairing or replacing it. It quickly becomes clear that here at the Ludwigsfelde location is where the MRO expertise for the CF34, the most widespread and best-selling engine of its class worldwide, is concentrated.

In addition to the CF34, MTU provides service support for the Pratt & Whitney Canada PT6A, PW200, PW300 and PW500 engines and industrial gas turbines at its Ludwigsfelde location.

Experts for all engine types: MTU Maintenance Berlin-Brandenburg's portfolio includes all engine models in the CF34 family.

Portfolio includes all CF34 models

The decision to locate the MRO activities for the CF34 in Ludwigsfelde was made in the year 2000. The first engines to be overhauled arrived in Brandenburg in 2003. "From then on, the challenge lay in managing the ramp-up of this new engine type, and coping with increasing numbers practically from the get-go," explains Frank Deubert from CF34 Engineering, who has supported the engine family for more than ten years. MTU's portfolio in the meantime includes all engine models in the CF34 family and the company is the world's leading independent MRO provider for this engine program.

Experience from over 1,000 shop visits

In 2017, MTU Maintenance Berlin-Brandenburg celebrated the 1,000th CF34 shop visit–together with representatives from British Airways Cityflyer, which owns the milestone engine. The British regional airline is one of more than 90 customers that entrust the maintenance of their CF34 engines to MTU's experts. According to Ludwigsfelde program manager Thomas Needham, the future prospects are also looking good: "Over 7,100 CF34 engines are currently flying worldwide. Above all the big CF34s, the CF34-8 and -10, are very successful in the market and therefore also play a predominant role in what goes on here in the shop. We are clearly focusing on further growth in this area over the coming years." Additionally, the newer CF34 models are now also nearing their prime maintenance age: the market environment thus remains healthy.

Put through its paces: a CF34 being rigged up for testing.

A wealth of experience gained from over 1,000 CF34 shop visits.

MTU AG (disclosures in accordance with the German Commercial Code (HGB))

The management report of MTU AG and the group management report for the financial year 2017 have been combined in accordance with Sections 298 (2) and 315 (5) of the German Commercial Code (HGB). The annual financial statements of MTU AG were prepared in accordance with the provisions of the German Commercial Code (HGB) and are published together with the combined management report in the electronic version of the Federal Gazette (Bundesanzeiger).

The business environment of MTU AG corresponds for the most part with that of the group as described above under the heading “Business environment.”

Business activities

MTU AG develops and manufactures commercial and military aircraft engines and aero-derivative industrial gas turbines. The company also carries out maintenance of military engines. In the military sector, MTU AG has for many decades been the leading company in the national market and lead industrial partner to the German armed forces.

The company is a technological leader in low-pressure turbines, high-pressure compressors, and turbine center frames as well as repair techniques and manufacturing processes. MTU AG is a key partner in all national and international technology programs of note, and cooperates with the top names in the industry – GE Aviation, Pratt & Whitney and Rolls-Royce.

Disclosures relating to operating results

Income statement of MTU Aero Engines AG

			Change 2017 - 2016	
in € million	2017	2016	in € million	in %
Revenues	**2,786.1**	**2,667.2**	**118.9**	**4.5**
Cost of sales	–2,373.0	–2,355.1	–17.9	–0.8
Gross profit	**413.1**	**312.1**	**101.0**	**32.4**
Selling costs	–71.5	–63.4	–8.1	–12.8
General administrative expenses	–36.8	–40.4	3.6	8.9
Balance of other operating income and expenses	–19.8	20.1	–39.9	<-100
Financial result	132.0	144.7	–12.7	–8.8
Earnings from ordinary operating activities	**417.0**	**373.1**	**43.9**	**11.8**
Tax expense	–131.6	–101.9	–29.7	–29.1
Net profit for the year	**285.4**	**271.2**	**14.2**	**5.2**
Allocations to other reserves [1]	–142.7	–135.6	–7.1	–5.2
Net profit available for distribution	**142.7**	**135.6**	**7.1**	**5.2**

[1] For allocation to other revenue reserves in accordance with Section 58 II of the German Stock Corporation Act (AktG) following approval by the Supervisory Board

Revenues

Revenues in the financial year 2017 rose by € 118.9 million (4.5%) to € 2,786.1 million. This corresponds to the growth in the commercial engine business, especially in the spare parts and aftermarket sectors, which outweighed the anticipated decline in the military engine business and the effect of the U.S.-dollar exchange rate (average exchange rate 2017: 1.1297; average exchange rate 2016: 1.1069).

Cost of sales and gross profit

At € 2,373.0 million, the cost of sales rose only marginally compared with the previous year (2016: € 2,355.1 million). This development is in line with revenues and the underlying implemented product mix. Gross profit increased at a proportionately higher rate than revenues by € 101.0 million to € 413.1 million. This was coupled with a rise in the gross margin to 14.8% (2016: 11.7%).

Balance of other operating income and expenses

In the reporting period, this item mainly comprised a net expense of € 41.5 million (2016: net income of € 9.1 million) from foreign currency translation and measurement of currency holdings, and € 31.9 million (2016: € 6.5 million) recognized in respect of the amortization of prepaid expenses. This item was impacted in the 2016 reporting year by the net proceeds from the disposal of MTU's shareholding in Middle East Propulsion Company Ltd., Riyadh, Saudi Arabia, which amounted to € 4.1 million, and an amount of € 9.4 million arising from the statutory imposition of a higher discount rate when measuring pension obligations.

Financial result

MTU's financial result deteriorated by € 12.7 million to € 132.0 million in the financial year 2017 (2016: € 144.7 million). It includes an amount of € 153.1 million (2016: € 174.3 million) representing MTU's share in the profit/loss of equity investments, of which the profit and loss transfer agreements with MTU Maintenance Hannover GmbH, Langenhagen, MTU Maintenance Berlin-Brandenburg GmbH, Ludwigsfelde, and MTU Versicherungsvermittlungs- und Wirtschaftsdienst GmbH, Munich, accounted for a total of € 135.4 million (2016: € 136.8 million). In the previous year, this item included a special dividend distribution of € 18.2 million paid out by MTU Maintenance Canada Ltd., Richmond, Canada.

The net interest expense improved in the reporting period, decreasing by € 8.2 million to € 25.8 million (2016: € 34.0 million), mainly as a result of costs incurred in the previous year for the convertible bond and lower interest expenses in the reporting year resulting from the scheduled repayment of the bond in mid-2017.

Earnings from ordinary operating activities

The group's earnings from ordinary activities in 2017, at € 417.0 million, was higher by € 43.9 million than in the previous year (2016: € 373.1 million).

Tax expense

Income taxes amounted to € 130.7 million in the financial year 2017 (2016: € 100.8 million). The current effective tax expense amounts to € 120.1 million (2016: € 89.6 million), while the deferred tax expense amounted to € 10.6 million (2016: € 11.2 million). The tax expense includes expenses of € 0.5 million in connection with prior years (2016: income of € 10.1 million).

Net profit available for distribution

Assuming the Supervisory Board approves the proposal of the Executive Board to allocate € 142.7 million (2016: € 135.6 million) to revenue reserves as required by Section 58 (2) of the German Stock Corporation Act (AktG), the net profit available for distribution to the shareholders of MTU Aero Engines AG would amount to € 142.7 million in the financial year 2017.

Net of deferred taxes, amounts totaling € 130.8 million (2016: € 95.0 million), arising mainly from the capitalization of internally generated intangible assets pursuant to Section 248 (2) of the German Commercial Code (HGB), and a gain of € 41.8 million (2016: € 38.0 million) due to the changed method of determining the discount rate applicable to the measurement of pension obligations as required by Section 253 (2) of the German Commercial Code (HGB), were excluded from the net profit available for distribution and were matched in full at the reporting date by free reserves as required by Sections 268 (8) and 253 (6) of the German Commercial Code (HGB).

The Executive Board has proposed to the Supervisory Board that, following allocations to other reserves, a dividend of € 2.30 per share (2016: € 1.90) be paid out to shareholders for the 2017 financial year. This corresponds to a dividend yield of 1.5% (2016: 1.7%), based on the closing share price at year-end 2017 of € 149.40 (2016: 109.80). On condition that the proposal is accepted, the total dividend payment will amount to € 118.4 million (2016, by resolution of the Annual General Meeting: € 97.6 million). Pending approval by the Annual General Meeting, the dividend for the financial year 2017 will be paid on April 16, 2018.

Disclosures relating to financial situation and net asset position

Balance sheet of MTU Aero Engines AG

	Dec. 31, 2017		Dec. 31, 2016		Change 2017 - 2016	
in € million	in € million	in %	in € million	in %	in € million	in %
Assets						
Intangible assets and property, plant and equipment	1,650.9	33.7	1,559.6	31.6	91.3	5.9
Financial assets	877.8	17.9	867.6	17.6	10.2	1.2
Total assets	**2,528.7**	**51.6**	**2,427.2**	**49.2**	**101.5**	**4.2**
Inventories	873.4	17.8	884.8	17.9	–11.4	–1.3
Receivables and other assets	1,375.2	28.0	1,273.2	25.8	102.0	8.0
Securities			25.0	0.5	–25.0	–100.0
Cash and cash equivalents	0.2		193.5	3.9	–193.3	–99.9
Current assets	**2,248.8**	**45.8**	**2,376.5**	**48.1**	**–127.7**	**–5.4**
Prepaid expenses	**4.2**	**0.1**	**7.0**	**0.1**	**–2.8**	**–40.0**
Deferred tax assets	**120.6**	**2.5**	**129.0**	**2.6**	**–8.4**	**–6.5**
Total assets	**4,902.3**	**100.0**	**4,939.7**	**100.0**	**–37.4**	**–0.8**
Capital						
Subscribed capital	51.5	1.1	51.4	1.0	0.1	0.2
Capital reserves	408.9	8.3	393.2	8.0	15.7	4.0
Revenue reserves	972.8	19.8	789.9	16.0	182.9	23.2
Net profit available for distribution	142.7	2.9	135.6	2.7	7.1	5.2
Total equity	**1,575.9**	**32.1**	**1,370.1**	**27.7**	**205.8**	**15.0**
Pension provisions	600.7	12.3	568.5	11.5	32.2	5.7
Other provisions	1,279.4	26.1	1,256.3	25.4	23.1	1.8
Total provisions	**1,880.1**	**38.4**	**1,824.8**	**36.9**	**55.3**	**3.0**
Liabilities						
Bonds	602.4	12.3	856.4	17.3	–254.0	–29.7
Liabilities to banks	108.2	2.2	30.1	0.6	78.1	>100
Advance payments received	300.0	6.1	329.3	6.7	–29.3	–8.9
Trade payables and sundry other liabilities	253.2	5.2	347.1	7.0	–93.9	–27.1
Total liabilities	**1,263.8**	**25.8**	**1,562.9**	**31.6**	**–299.1**	**–19.1**
Deferred income			**1.5**		**–1.5**	**–100.0**
Deferred tax liabilities	**182.5**	**3.7**	**180.4**	**3.8**	**2.1**	**1.2**
Total equity and liabilities	**4,902.3**	**100.0**	**4,939.7**	**100.0**	**–37.4**	**–0.8**

Total assets decreased by € 37.4 million (0.8 %) year on year to € 4,902.3 million.

Intangible assets and property, plant and equipment increased by a total of € 91.3 million to € 1,650.9 million. In the financial year 2017, intangible assets in the amount of € 101.7 million were capitalized. Of this sum, € 16.5 million (2016: € 5.1 million) relates to shares in the GE9X, GEnx and PW800 programs. Other additions to intangible assets included externally acquired development costs amounting to € 25.3 million (2016: € 35.9 million) and internally generated development costs amounting to € 57.9 million (2016: € 53.1 million) for the PW1000G engine family, the GE9X and for the PW800 engine programs. Research and development expenses (recognized under cost of sales) amounted to € 82.8 million in 2017, up € 14.4 million on 2016. Altogether, MTU's total expenditure on development projects amounted to € 151.9 million (2016: € 153.2 million). Property, plant and equipment increased in particular as a result of new and replacement purchases of fixtures and other tools for existing and new engine programs, and IT equipment.

In 2017, inventories decreased by € 11.4 million or 1.3 % to € 873.4 million (2016: € 884.8 million). Inventories of raw materials and supplies increased by € 18.4 million to € 102.2 million (2016: € 83.8 million), while work in progress and finished products in inventory decreased by € 10.8 million to € 437.1 million (2016: € 447.9 million) and by € 17.3 million to € 314.6 million (2016: € 331.9 million), respectively. Advance payments decreased by € 1.7 million to € 19.5 million (2016: € 21.2 million). Altogether, inventories currently account for 17.8 % of net assets, almost unchanged from 2016 (17.9 %). The sales to inventory ratio was 3.2 (2016: 3.0).

Receivables and other assets increased by € 102.0 million year on year to € 1,375.2 million. The main items contributing to this increase relative to the previous year were accounts receivable from related companies, which rose by € 74.5 million to € 519.2 million, and accounts receivable from entities in which MTU holds an equity interest, which increased by € 72.7 million to € 462.3 million. Trade receivables from third parties decreased by € 43.9 million to € 293.1 million. Compared with the financial year 2016, other assets decreased by € 1.3 million to € 100.6 million.

Cash and cash equivalents decreased by € 193.3 to € 0.2 million. Their percentage of total assets decreased by 3.9 % (2016: increase of 3.9 %).

Equity comprises the capital stock less the nominal amount of treasury shares, capital and revenue reserves and the net profit available for distribution. The increase in the equity ratio by 4.4 percentage points to 32.1 % is primarily attributable to the net profit for 2017 of € 285.4 million.

Provisions increased by € 55.3 million to € 1,880.1 million. This figure includes pension provisions of € 600.7 million (2016: € 568.5 million), an increase of € 32.2 million (5.7 %). Sundry other provisions increased year on year by € 23.1 million. The main components of this increase are the increase in warranty obligations of € 65.3 million, due to higher revenues, as well as contingent liabilities from the risk of losses arising from the settlement of accounts in the construction contract and service business of € 41.0 million. An opposite effect was incurred by the decrease of € 32.5 million in the amount of provisions for the cost of sales arising from the settlement of accounts not yet recognized at the reporting date, and of € 27.6 million in the amount of the provision for gains or losses on forward foreign exchange transactions as a result of fair-value adjustments. Provisions for tax liabilities were € 4.7 million lower than in the previous year.

Total liabilities decreased year on year by € 299.1 million to € 1,263.8 million. On the back of the repayment of the bond (debenture) amounting to € 250 million, as well as payment of the interest claims of the creditors (€ 4.0 million), liabilities attributable to bonds decreased overall by € 254.0 million. While advance payments received from customers decreased by € 29.3 million to € 300.0 million, trade payables and liabilities to banks increased by € 27.1 million to € 75.5 million and € 78.1 million to € 108.2 million, respectively. Liabilities to related companies decreased by € 17.5 million to € 2.3 million. Other liabilities, which decreased by € 103.5 million to € 175.4 million, mainly comprise liabilities arising from investments in engine programs in the amount of € 51.0 million, liabilities in connection with acquired development services in the amount of € 42.5 million, and personnel-related financial liabilities amounting to € 37.0 million.

Other disclosures

The opportunities, risks and future development of MTU AG essentially correspond to the opportunities, risks and future development of the MTU group as described in later sections of this combined management report (“Forecasts” and “Risk and opportunity report”).

As the group’s parent company, MTU AG is integrated in the group-wide risk management system that is described in detail in the risk and opportunity report. The description of the internal control system of MTU AG required under Section 289 (4) of the German Commercial Code (HGB) can be found under the heading “The internal control and risk management system in relation to the group accounting process.”

→ further information on page 122

For further information on the use of financial instruments, please refer to the Notes to the consolidated financial statements and to the section of the risk and opportunity report entitled “Use of financial instruments.”

Due to its dominant role within the OEM operating segment (commercial and military engine business), and in view of the profit and loss transfer agreements that exist between the parent company and its German maintenance subsidiaries in the MRO operating segment, the outlook for MTU AG is closely aligned with the expected future development of the group as described later on in this combined management report under the heading “Future development of MTU.”

Looking ahead to the annual financial statements for MTU AG in 2018, which are prepared in accordance with the provisions of the German Commercial Code (HGB), the Executive Board expects revenues in the OEM segment to increase in U.S.-dollar terms compared with 2017 by a low double-digit percentage. Revenues in the military engine business are forecast to remain constant in 2018. Assuming a stable exchange rate between the U.S. dollar and the euro, MTU expects its earnings from ordinary operating activities to grow at a moderate rate in 2018.

Forecasts

Macroeconomic factors

The Economist Intelligence Unit (EIU) predicts global growth of 2.9% in 2018. In the USA, the EIU expects steady growth of 2.3%, while in the eurozone the economic growth rate looks likely to level out at 2.2%. The main focus is on the reorganization of the EU and the handling of BREXIT. For China, the EIU forecasts a decline in economic output of 6.4% in 2018. China secures its growth through the liberal granting of credit and is not driving efforts to reduce debt forward to the extent expected.

The global economy faces a number of risks. These include a slowdown in growth in China, a crash of the U.S. stock market, and geopolitical tensions.

Microeconomic factors in the aviation industry

Industry continues to grow

The International Air Transport Association IATA estimates that global air transport will increase by a robust 6.0% in 2018. In order to meet this demand, Airbus has announced that it will deliver in the region of 800 aircraft in 2018.

Prompted by full order books, aircraft manufacturers Airbus and Boeing are planning to raise their production of A320 and Boeing 737 aircraft. By 2019, Airbus intends to increase the monthly output of the A320 family to 60 aircraft, and Boeing to 57 737 aircraft. From 2019, Boeing plans to increase production of the 787 from 12 to 14 aircraft per month.

For 2018, the EIU is expecting the price of a barrel of Brent crude oil to average U.S. $ 60 (2017: U.S. $ 54). Increasing passenger numbers and the continued moderate oil prices currently ensure full capacity utilization of the existing fleet.

Future development of MTU

The statements below are based on the knowledge available at the beginning of 2018. Owing to the large number of new programs, any delays that might occur in development or in the ramp-up of series production could have an effect on the performance indicators.

Expenditure on new products and services

The ramp-up of the new Geared Turbofan™ programs, which are enjoying considerable market success, has for the past several years called for substantial capital expenditure on development and production resources.

In order to keep cost growth in check, MTU began implementing measures in 2013 that were subsumed in the Cash for Future project. The measures will achieve lasting cost savings of several tens of millions of euros per year. These savings have ensured the company has sufficient scope to invest in additional engine programs such as the GE9X.

The ramp-up of the new engine programs means that MTU has had to invest heavily in building up highly productive manufacturing and logistics capacities at its main site in Munich. What is more, the company continued to expand its manufacturing facility in Poland.

Outlook for 2018

Targets
MTU's targets for the financial year 2018 are as follows:

Outlook for 2018

in € million	Forecast for 2018	Actual 2017
EBIT adjusted	Moderate growth	606.6
Net income adjusted	Growth in line with EBIT adjusted	429.1
Free cash flow	Stronger growth than net income adjusted	151.0

The company expects its earnings and free cash flow to continue rising in 2018.

Revenues by operating segment
In the commercial engine business, MTU expects to see an increase in revenues in 2018, both from engine manufacturing activities and from spare parts sales. Prior to the effects arising from the changes to IFRS 15, this business unit is expected to grow in U.S. dollar terms by a percentage in the low double-digit range.

Revenues in the military engine business are expected to remain stable in 2018.

Growth in the commercial engine business is based above all on a doubling of deliveries under the new Geared Turbofan™ programs, whereas deliveries of the V2500 predecessor are expected to decline. The increase in revenues from spare parts sales derives principally from the V2500 program.

MTU's revenue forecast for its commercial maintenance business (MRO segment) in 2018 is for a growth rate in the high teens in U.S.-dollar terms. MRO activities are expected to rise, for example, in connection with the V2500 and the new Geared Turbofan™ programs.

Identified risks in the commercial new engine and maintenance segments relate to the possibility of delays in ramping up the new engine programs, above all in light of the technical problems relating to a component of the Geared Turbofan™ engine identified in February 2018, which lies within the responsibility of a partner. MTU bases its forecast on the assumption that the problems can be rectified in the short term and the delivery targets can still be met.

Given these considerations, MTU expects to see total group revenues grow in euro terms by a percentage in the low-to-mid teens. This estimate is based on an average exchange rate of the U.S. dollar to the euro of 1.20 and does not take effects arising from the application of IFRS 15 into account.

Operating profit

MTU expects its operating profit (EBIT adjusted) to increase moderately in 2018 compared with 2017. The enormous ramp-up of the new programs is likely to have a negative impact on earnings. MTU assumes that the effect of these changes will be outweighed by growth in spare parts and commercial MRO sales.

Moderate increase in operating profit expected

Net income adjusted (NI adjusted)

In 2018, net income adjusted are expected to grow in line with EBIT adjusted.

Free cash flow

2018 will be another year of high investment spending. However, MTU plans to compensate for these effects through its operating activities and achieve a higher free cash flow conversion rate (ratio of free cash flow to net income adjusted) compared with the 2017 financial year.

Future dividend

It is MTU's policy to pay an attractive dividend. Based on the overall prognosis of future business developments, MTU expects to be able to maintain a stable dividend yield in 2018, subject to the approval of the corporate bodies responsible for this decision.

Employees

Due to strong business growth in both operating segments, MTU expects the size of its workforce to increase slightly in 2018. This mainly concerns the MTU locations in Poland, Berlin and Munich. Looking at the group as a whole, the global workforce is expected to increase only moderately, at a lower rate than revenues.

Research and development

In 2018, MTU will continue to focus its research and development activities on increasing engine efficiency by improving the performance of the key components in which MTU possesses specialized technological expertise, namely the low-pressure turbine, high-pressure compressor and turbine center frame, with a view to reducing fuel consumption and emissions and reducing the frequency of repairs. A detailed report on research and development activities, including the targeted medium- and long-term reductions in fuel consumption and emissions, is provided earlier in this combined management report, under the heading "Research and development".

→ further information on page 64

Overall prognosis of future business developments in 2018

The MTU Executive Board remains optimistic that it will be able to profitably expand the company's business in 2018, leading to a further increase in revenues (before transitional effects from the first-time application of IFRS 15), earnings and free cash flow. The sustained high level of R&D activities and the ramp-up of production for the new Geared Turbofan™ programs in 2018 will provide a sound basis for the sustained long-term growth of MTU's business.

Risk and opportunity report

Risk report

Risk is an inherent part of any entrepreneurial activity. To meet the expectations of its shareholders, MTU must exploit opportunities – and that entails a certain degree of risk.

MTU has an integrated opportunity and risk management system in place, which is linked to the group's value-oriented performance indicators and its organizational structure. The system ensures compliance with statutory requirements and is based on the internationally recognized COSO II Enterprise Risk Management (ERM) Framework. To assist in implementing risk management in the MTU group, the central risk management department provides the risk owners with guidance in the shape of information and working aids. These include the MTU risk guidelines and the MTU risk manual, and an extensive checklist, which give specific examples of what is set down in the guidelines and provide help in everyday practice.

The systematic consideration of significant risk factors is of vital importance to the MTU group, and serves as a fundamental basis for value-oriented controlling functions and sustainable business success. MTU identifies risks, analyzes their possible consequences and devises measures to limit them. The key areas of risk exposure are as follows:

- Risks arising from macroeconomic factors and corporate strategy
- Market and program risks
- Risks associated with product development and manufacturing
- Other risks pertaining to business operations

Strategy and risk management system

Control environment

MTU regards a suitable control environment as being essential for a functioning risk management system. The following are considered the main elements of such an environment:

- Management style and philosophy
- Integrity and ethical values
- No-blame culture
- Staff training and development

The concept of learning from mistakes is embodied in the MTU Principles in the chapter "Co-operation and behavior". The striving for continuous improvement and identifying inefficiency is supported organizationally through LEAN@MTU, which aims to encourage employees to deal openly with potential for improvement and create a culture that underpins a functioning risk management system.

Risk management objectives and risk strategy

The objective of MTU's risk management system is to create transparency with regard to all risks and opportunities as well as to ward off risks to MTU's status as a going concern and to safeguard the company's future business success.

MTU does not limit itself to ensuring compliance with statutory requirements. It seeks to integrate its corporate risk and opportunity management system into all business processes, from financial planning, to control and reporting processes, right through to monthly reporting to the Executive Board and the Supervisory Board. Risk management also takes place in other corporate areas, for instance it is a key component of project management.

Identification, analysis and management of risks

MTU regards risk management as a continuous process that ensures responsible behavior when dealing with specific risks at business unit level and general risks affecting several business units or the entire group.

The group's risk inventory, which encompasses all the business units and all the risk factors to which MTU is exposed, forms the basis for identifying risks. According to the COSO II Framework, it is divided into governance and compliance, strategy and planning, operations and infrastructure, and reporting. In the interests of a more detailed assessment of risks, MTU has divided this framework into 15 risk categories covering all corporate areas. MTU also examines risks inherent in its business activities that may affect third parties.

Operational risk management takes place at the level of the individual, organizationally separate business units and in the subsidiaries. They are responsible for identifying, assessing, controlling and monitoring the risks in their specific areas, and documenting them in a central risk management tool. To this end, they use a general risk checklist derived from the risk inventory. They submit mandatory reports to the central risk management department for risks exceeding an amount of € 1 million over the five-year period under consideration, at dates allowing them to be reviewed together with the quarterly financial results. The risk maps also serve to document risks below the threshold of € 1 million. Risks valued at more than € 10 million are reported immediately to the central risk management department. Risks are assessed based on uniform definitions of the probabilities of loss occurrence and as possible deviations of the group performance indicators "EBIT adjusted" and "free cash flow" from the currently applicable operational planning figures. In addition to financial risks, risk management also expressly considers non-financial risks.

The central risk management department aggregates and consolidates the reported risks. This department is also tasked with providing assistance during the risk management process, prescribing uniform methods and tools, and evaluating the overall risk position at group level. It furthermore supports the work of the cross-divisional Risk Management Board, which acts at group level to perform centralized control and monitoring functions. At its quarterly meetings, the Risk Management Board discusses the interactions between individual risks, ensures that all risks have been reported in full, and assesses the risk exposure of the group as a whole.

Risk reporting and risk communication

The Executive Board receives a risk report once a quarter that has been coordinated with the Risk Management Board and that is divided up into reporting segments, and it is kept informed of the group's current risk situation. The Top Risk Map comprises all risks and opportunities above € 10 million in value over a five-year period and gives details of their probability of occurrence and countermeasures. The Supervisory Board's Audit Committee is also given an update of the MTU group's risk position on a quarterly basis. The most important issues from the previous risk review are also presented in the monthly report to the Executive and Supervisory Boards.

Monitoring the risk management process

Monitoring the risk management process is of crucial importance for ensuring the proper functioning and ongoing development of the risk management system. In addition to verification by the auditor of the system employed for the early recognition of risks, the risk management system is monitored and verified by a number of other functions:

- Regular checks by the internal auditing department
- Oversight by the Supervisory Board
- Process reviews by the Risk Management Board in the form of a self-assessment

Strategy risks

Risks arising from macroeconomic factors

In general, the MTU group's business development is subject to a number of different risks, especially the U.S. dollar exchange rate, the level of commodity prices, the development of air traffic, and general economic risks. Taking the latest market forecasts into account, MTU does not currently discern any major negative impacts for the company arising from reduced economic growth in emerging markets, from the high sovereign debt in certain nations of the world economy or from the resulting monetary policy of the central banks. MTU is currently analyzing the possible effects of recent changes in the political environment (EU and U.S. interest rate policy and changes in international tax and customs regulations), in order to identify potential risks. Political crises in some regions and restrictions on air travel imposed as a result of natural disasters, epidemics or terrorist attacks are regularly discussed during the risk management process, but are currently not classified as critical. If the current economic situation should deteriorate, this could impact the volume of passenger or freight traffic and prompt a more cautious approach to orders for new air transportation capacity. In addition, further national budget cuts could negatively impact the military engine business. The current view, however, is that defense budgets are more likely to increase. Other risks affecting industry in general include fluctuating energy costs, the unavailability of suppliers, and delays in deliveries from suppliers. A further risk affecting engine programs are changes to interest rates and delayed delivery schedules due to the typically long lead times.

Risks arising from corporate strategy

The main forms of strategy risk are misjudgments when taking decisions concerning investments in engine programs, the establishment of new sites, and possible M&A activities. During the decision-making phase of a program, highly qualified specialists perform cost-benefit analyses based on set procedures that include the obligation to carry out a risk analysis on the basis of different scenarios. MTU's business model is based on long-term processes, particularly in the OEM segment. Many years of development, preproduction and series production may lie between the decision to invest in a new commercial engine and the breakeven point. The risk is that the original economic and technological parameters on which the decision was based might change over the course of time, hence the need for frequent reassessments that take into account the most recent economic and technological developments. Decisive factors in this regard are, in particular, the success of the aircraft platforms on which the engines are deployed and any changes made to those platforms. MTU counters such strategy risks by means of a broad portfolio. That means that the company limits the impact of an individual program or aircraft platform by holding an interest in a wide range of products across all thrust classes.

In the longer term, a further identifiable risk in addition to that arising from MTU's strategic decisions is the arrival on the market of new competitors, e.g. from Russia or China. But given the high barriers to market entry, this risk is currently not regarded as critical.

Substitution risks arising from disruptive technologies

Electric propulsion systems for aircraft are in principle a substitution risk for conventional engine technologies, but they do not yet by far achieve the performance required to power a large passenger or freight aircraft. In collaboration with research partners, MTU has been studying all conceivable concepts, in order to be prepared. Among the key results from these studies are:

- If they continue to develop as expected (i.e. 5% improvement of electrical storage capacity of batteries per year), it will be 30 years before electric engines can be used on regional aircraft.
- For short and medium-haul aircraft, which are an important market for MTU, there are some initial ideas for how to improve the battery capacity, but several decades of development work will be required until they can be used commercially.
- For long-haul aircraft, MTU's second most important market, no battery concepts with sufficient capacity are known of at present.

Much closer to a market introduction in the commercial aviation sector are hybrid propulsion systems, which combine electric engines, generators, gas turbines and batteries. These open up new possibilities for aircraft design and engine integration and still rely on an energy source with high energy density in the form of kerosene. MTU is involved in a number of studies that are examining the potential of these propulsion concepts.

So, from today's perspective, the MTU fields of business will not be affected by substitution risks in the foreseeable future. However, MTU will keep a close eye on the progress of developments in the field of electric motors and batteries, and compile further studies in order to be able to react in a timely fashion.

A change to alternative propulsion systems will not come suddenly; rather, it is expected to be characterized by a gradual transition with hybrid concepts, in which MTU's current products will continue to play a key role. What is more, MTU is permanently working on improving the efficiency of conventional engines, thus continuously raising the bar for any substitute products. In view of MTU's core fields of expertise, an involvement in an electrically propelled aircraft is conceivable, so it considers this risk to be manageable.

Further risks could arise as a result of the trend toward increasing digitalization. MTU is monitoring developments in this area very closely and, by implementing its own digitalization strategy, is ensuring that all key areas are covered. From today's perspective, risks to MTU's business model arising from disruptive technologies are unlikely.

In all, MTU does not see any strategic risks at the present time that might endanger its status as a going concern.

Market and program risks

The profit to be gained from existing and established engine programs across their entire lifecycle depends to a large extent on aftermarket sales. Many airlines are still experiencing financial difficulties, especially as a result of competitive pressure in the aviation market (see the recent insolvencies in the EU). This already strained situation may be further strongly impacted by changes in fuel prices, by exchange rate fluctuations or by state intervention in the aviation industry. Given this, airlines are striving to keep their operating costs, including their aircraft and engine maintenance costs, as low as possible and to improve and lock in their profit margins. In addition, they may delay shop visits or replace defective parts or entire engines with used ones instead of new ones.

As a result, the market has also changed for new engine programs, to the extent that the engine manufacturers mainly sell their engines with maintenance packages. So, success no longer depends solely on spare-part sales, but also on the ability to forecast the volume of maintenance services including the supply of spare parts. As with production engines, a key element of the sales campaigns is to offer discounts on maintenance services sold.

Moreover, as part of the sales campaigns engine manufacturers frequently offer loan arrangements to the end customer. These agreements are provided in two basic forms: predelivery payment (PDP) and backstop commitments. Within the scope of its partnerships in engine programs, MTU is active in the financing by consortium leaders (OEM) of aircraft for end customers. MTU's share of these loan agreements is equivalent to its proportional stake in the engine program. It is a fundamental condition that the funds are always made available to the aircraft manufacturer by the lead partners in the consortia (OEM) for the exclusive benefit of a specific airline. The risk of suffering a loss because an airline becomes insolvent is currently considered to be low, due to the collateral rights pertaining to retained goods. What is more, the airlines currently only avail themselves of these arrangements to a limited extent because loans are often available at better terms and conditions on the market than through the loan arrangements in question (see also the section headed "Financial situation").

MTU's military engine business customers are national and international agencies, therefore, political changes have an almost immediate effect on MTU. With the tight national budgets that can be observed especially in Europe at present, there is always the risk of buyer countries postponing or cancelling orders. For similar reasons, it may become necessary to renegotiate the scope of deliveries already agreed in existing contracts. In the military engine business, MTU is firmly embedded in international cooperative ventures, which tend to have a limiting effect on risks because the partners work together to protect their common interests. Furthermore, the terms of existing contracts in the military sector are generally defined to cover a prolonged period of time, thus largely ruling out price risks.

The client base in the MRO business is characterized by large individual customers. When committing to new large-scale contracts, the risk arises of not being able to foresee all future economic developments over the long term. Some engine programs in the MRO phase are already at an advanced stage of their lifecycle. This harbors the risk of MTU's MRO portfolio becoming too focused on aging products with a limited future. MTU strives to maintain a balanced portfolio that is constantly being expanded to include maintenance services for new engine programs. However, new programs also harbor a ramp-up risk.

Dependency on cooperative agreements

The commercial engine market is dominated by a small number of major manufacturers. MTU sells most of its products under risk- and revenue-sharing arrangements with market leaders. The major engine manufacturers, who are the lead partners in the consortia (OEM), determine the prices, conditions and concessions. They also define the engine development processes prior to the market launch phase of new engines, e.g., the scope of development costs and the payments toward development made by the individual partners in the consortia. As one such partner, MTU has rights of objection and control, and can improve its own position through negotiations. By virtue of these partnerships, MTU is able to participate in the industry-leading engine programs of the major engine manufacturers. In the commercial engine and maintenance sector, the customers of the consortium leaders (OEM) are airlines and aircraft leasing companies. The marketing of commercial engines and the maintenance services they entail always involves making concessions to the end customers. MTU is obliged to absorb these concessions to the extent of its program share in risk- and revenue-sharing arrangements. The fact that the cooperation partners share a common interest helps to prevent excessive concessions during contract negotiations with the end customers.

In the commercial maintenance business, MTU's interests in the Asian market include a 50:50 joint venture, MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China. MTU is involved in further joint ventures in the fields of engine leasing, maintenance and development in order to keep abreast of the new structures in the aftermarket and be able to offer the customers a comprehensive range of services. In jointly controlled entities, where decisions have to be made by consensus, there is always a risk of differences of opinion. Participation in international joint ventures also very often reveals cultural and political differences (for instance payment morale).

From today's standpoint, MTU believes its collaborative business model stands it in good stead to effectively manage the market and program risks; in particular in respect of the challenges associated with the development, production and market introduction of new engine programs and architectures. MTU therefore does not expect these market and program risks or its dependency on cooperative agreements to have any significant impact on the group's continued existence as a going concern.

Risks associated with product development and manufacturing

Development risks

In the commercial and military engine business, MTU undertakes to perform development work, during which delays and additional costs may arise. The company ensures strict adherence to time schedules and budgets by permanently monitoring project management across all the departments involved and applying appropriate corrective measures where necessary. Furthermore, through its involvement in collaborative ventures, it works in partnerships that extend beyond corporate boundaries, thus spreading the risk; however, in isolated cases MTU can suffer significant economic impacts as a result of development and production risks materializing with cooperation partners. As the market launch of the innovative GTF engines demonstrates, the complexity of the products means that technical risks cannot be ruled out completely – even when all possible risk minimization measures are implemented. Such risks are not unusual in the context of rolling out completely new product architectures, however.

MTU products are subject to extremely stringent safety requirements. The company requires numerous official certifications, particularly from the EASA, in order to carry out its activities. These certifications are valid for limited periods and can be renewed only after further tests have been carried out. The well documented development process ensures compliance with all regulations.

Production risks / shop floor risks

Highly sophisticated components and new materials are called for to meet the requirements of the airlines and OEMs with respect to engine weight, fuel consumption and noise emissions. In order to produce and process such components, MTU develops – and gains official approval for – innovative new manufacturing techniques suited to meeting these challenges and ensuring efficient processing. This can lead to delays in the start of production, temporarily increased unit costs or temporarily reduced delivery volumes to below those originally agreed. A further risk is that customers might impose penalties in the event that deliveries are delayed. It could also happen that the new manufacturing processes are not yet sufficiently mature to fully meet requirements when volume production is due to start. MTU counters this risk by providing systematic support for the development and implementation process in the context of technology projects.

Procurement and purchasing risks

MTU is dependent on suppliers and third-party vendors for some raw materials, individual parts and components, and for the provision of specific services. Risks can arise in the form of the unavailability of suppliers, problems with quality, and price increases. MTU strives to reduce its reliance on individual suppliers by securing the services of several, equally qualified, vendors for materials, parts and services. In the case of single-source suppliers, MTU enters into long-term agreements as a hedge against unforeseen shortages and to reduce the risk of sudden price hikes. The risks involved are manageable thanks to the broad diversity of the links in the supply chain.

Delays may arise when ramping up production of new, high-volume programs involving new production capacities, production processes or workflow systems, thus affecting the agreed delivery deadlines. MTU minimizes this risk through strict project management, the deployment of specialists and the implementation of program-specific preventive measures.

Liability risks

In the aviation industry, as elsewhere, accidents can still occur despite strict compliance with manufacturing quality standards and utmost diligence in performing maintenance work. In the military engine business (excluding exports), MTU is largely exempt from product risk liability through government agency indemnification. The remaining forms of product liability, especially in the commercial engine business, are covered by contractual clauses and by high-coverage insurance policies, including aircraft liability insurance. Other risks that could threaten the company's status as a going concern, such as loss of income through fire or the interruption of business operations, are similarly covered.

By virtue of MTU's collaborative business model and by additionally limiting liability risks and taking out insurance cover, the risks are rendered transparent and manageable. In this respect, MTU believes it is well-prepared to effectively manage the development, production and procurement risks and has not identified any risks related to these activities at the present time that might endanger its status as a going concern.

Use of financial instruments

More than 80% of MTU's revenues are generated in U.S. dollars. On the other hand, a large proportion of expenses is likewise invoiced in U.S. dollars, thus providing a natural hedge. Most other expenses are incurred in euros and, to a lesser extent, in Polish zloty, Chinese renminbi and Canadian dollars. In line with the corporate policy of generating profit solely on the basis of operating activities and not through currency speculation, MTU makes use of hedging strategies for the exclusive purpose of controlling and minimizing the effect of U.S. dollar exchange rate volatility on EBIT.

The forward foreign exchange contracts concluded by MTU cover the greater part of the net exposure to currency risk, leaving only a small portion of the U.S. dollar surplus exposed to this type of risk. The unhedged portion of future cash flows is translated into euros at the average exchange rate prevailing on the date of settlement.

MTU holds a long-term hedge portfolio comprising forward foreign exchange contracts with terms to maturity stretching over several years. At December 31, 2017, the value of the portfolio of hedging instruments with terms until 2020 amounted to U.S. $ 1,580.0 million (which translates to € 1,317.4 million at the exchange rate prevailing on the reporting date).

Detailed information on the financial instruments used to hedge future cash flows is provided in Section IV of the consolidated financial statements (Note 36).

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In view of this long-term hedging strategy, MTU considers its currency risks to be manageable.

For a detailed description of MTU's financial management system, please refer to the section entitled "Financial situation" (in "Principles and objectives of finance management").

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Other risks pertaining to business operations

Compliance risks
Compliance risks arise when managers or employees of the company fail to comply with laws and regulations or fail to observe internal guidelines. These risks can arise in all areas of the company.

MTU has implemented a number of measures to minimize these risks and to safeguard compliance. The corporate units ensure that laws are complied with and internal regulations observed. The quality department, for example, is responsible for compliance with aviation authority regulations, while the environmental health and occupational safety department ensures that environmental protection regulations are adhered to.

Above and beyond that, measures have been put in place to minimize the risks associated with compliance issues:

- Binding rules of conduct valid throughout the group
- Establishment of a central office to receive reports of suspected misconduct
- Establishment of a Compliance Board
- Continuous security checks of employees
- Regular training courses

Criminal intent can never completely be ruled out. All in all, MTU considers the compliance risks to be manageable, especially in light of the measures taken.

Non-payment risk
Airlines in particular are direct and indirect customers of MTU. These companies may find themselves facing financial difficulties that affect the receivables of MTU and its partners. The consortium leaders in the OEM business have extensive receivables management systems in place. No significant risks have been identified with respect to MTU's long-standing partnerships with OEMs. In the MRO business, the responsible MTU departments monitor accounts receivable in short cycles. A risk assessment is carried out before any new contract is signed and all necessary precautions are taken, for instance by requesting an export credit guarantee (Hermes coverage) – if available – as protection against political credit risk. As a matter of principle, the group avoids signing contracts for which the parameters cannot be calculated. Hence MTU considers non-payment risks to be transparent and manageable.

Environmental risks
MTU is subject to numerous laws and regulations aimed at protecting the environment. Any tightening of the applicable environmental or health and safety requirements may give rise to additional investment costs in connection with the processing of materials containing nickel and cobalt alloys and with the use of chemicals in manufacturing and test rig emissions. It may even become necessary to find replacement substances for those in use (REACH compliance). Further information on this can be found under the section heading "Non-financial statement." MTU requires special certification in order to operate certain production facilities. The regulations must be strictly observed and all procedures fully documented. An environmental management system certified to EMAS minimizes the risks in this area. MTU considers these risks to be manageable.

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IT risks

The main IT risks are loss of confidential data through espionage and system failures. Through its experience in dealing with military customers, MTU is particularly aware of the need to safeguard confidential data and operates a strictly controlled, highly advanced data security system. When new IT systems are introduced, there is a possibility of workflows being disrupted. MTU minimizes these risks by employing qualified experts and using professional project management. Although dealing with these risks is becoming more and more costly for MTU, the company still considers them to be manageable in light of the measures implemented.

Personnel risks

The shortage of skilled workers, which is intensified by demographic change, can pose risks to the company. For instance, there may not be enough top performers available to fill vacancies, competent and experienced employees could leave the company and knowledge may be lost. MTU currently considers these personnel risks to be low.

Risks arising from general, customs and tax legislation

Identifiable risks arising from pending tax audits or ongoing customs audits and legal proceedings are managed by the central departments with the support of independent external consultants. The economic impacts have been taken into account in the financial statements where necessary. MTU believes it is well-prepared to effectively manage the challenges arising from general, customs and tax legislation and has not identified any risks related to this at the present time that might endanger the company's continued existence as a going concern.

Overall assessment of MTU's risk exposure

Risks in each key area of exposure as described above are assessed for the coming financial year according to their probability of occurrence and quantified as a deviation of EBIT from the currently applicable operational planning figures. In MTU's risk management process, risks are assigned to one of four probability levels. Based on the assessment of MTU's top categories of measurable risk exposure, and provided that the technical and economic compensatory measures related to the rollout of the GTF engine architecture can be implemented, the following risk positions can be derived for the financial year 2018:

Assessment of the MTU group's risk exposure

in € million	OEM	MRO
Market and program risks	15.1	2.2
Risks associated with product development and manufacturing	1.4	./.
Other risks pertaining to business operations	./.	./.

Apart from a quantitative assessment of the top individual risks and overall risk position, MTU monitors and reports qualitatively on risks associated with development, production and procurement that are not assessable yet – especially in connection with its involvement in the GTF family of engines.

As well as the risks shown in the table above, the risk management process is also used to monitor unplanned events with an impact on free cash flow. In addition to the impact of identified risks on EBIT, this assessment revealed further risk factors affecting liquidity valued at approximately € 80 million. These possible impacts on free cash flow mainly result from uncertainties regarding OEM agreements for aftermarket business and from risks in connection with individual contracts with MRO customers. The company's existing lines of credit are sufficient to cover these risks. No other measurable risks have been identified over and above those previously mentioned.

Looking beyond the horizon of 2018, there is the possibility that the company may be exposed to other identifiable, in some cases significant, risk factors (potentially impacting earnings and free cash flow), which MTU is continuously monitoring and has integrated into its short- to medium-term planning and risk management processes. MTU considers it extremely improbable that all these risks might arise concurrently. Therefore, aggregated figures must be viewed merely as a rough indication of the MTU group's overall risk exposure.

At December 31, 2017, there had been no substantial changes in MTU's risk exposure compared with the end of the previous year. MTU continues to believe it is well-prepared to effectively manage its business risks, particularly those in connection with the development, production and market introduction of new engine programs. The level of risk exposure is manageable. From the present vantage point, the MTU group's continuing existence as a going concern is not endangered. MTU does not anticipate any fundamental changes in its risk exposure at the present time. MTU has taken every possible organizational measure to ensure early awareness of potential risk situations.

Opportunities report

Market and program opportunities

Basic research and the constant refinement of engine technologies followed by their deployment in the final products have made MTU one of the world's leading manufacturers of engine components. MTU's new products lead the field in terms of efficiency because they save fuel and reduce emissions, noise and costs. MTU has achieved considerable market successes with the Geared Turbofan™ (GTF) engines of the PW1000G family, which it develops in partnership with Pratt & Whitney. The A320neo and the Bombardier C Series with GTF engines are already being operated in scheduled service. Further GTF applications will enter scheduled service in the coming years, in particular in the regional jet segment. In order to balance out its engine portfolio in the long-haul segment, MTU has acquired a stake in the GE9X, which will be the sole engine for the Boeing 777X. Thanks to this balanced portfolio, MTU will benefit in the decades ahead from the predicted growth in all market segments – the regional jet, narrowbody and widebody segments. What is more, MTU has an opportunity to raise its share in the medium-haul market, because in addition to its stake in the PW1100G-JM for the A320neo family, it also holds a stake in the V2500 for the classic A320 family. The latter program is now entering the aftermarket phase, offering future potential in the spare parts business.

Among its customers in the military sector, MTU has established a reputation as a highly qualified partner with comprehensive system know-how in product development, manufacture and maintenance. In particular by driving forward its military-engine maintenance services with the German Air Force, MTU sees chances for strengthening its ties with Germany's armed forces.

What is more, ongoing export campaigns – especially for the Eurofighter EJ200 engine and the TP400-D6 for the A440M military transporter – present opportunities to acquire new customers for military business. In addition, the Eurofighter partner countries are discussing the procurement of spare parts for earlier delivery tranches of the Eurofighter.

Driven in particular by the T408 engine, the military-program partnership with GE Aviation is doing well and could generate further opportunities to participate in transatlantic programs going forward.

The changed maintenance-related business practices in the aviation industry, in which MRO services are increasingly being offered together with engine sales contracts, opens up opportunities for MTU to develop customer loyalty in the commercial maintenance segment through integrated service agreements that promise to soften the impact of risks associated with the spare parts market. This integrated approach to MRO enables program partners to become members of an MRO network, giving them access to the entire volume of MRO work associated with an engine series, the so-called network volume, in accordance with their share in the program. Various different work-sharing arrangements are possible. For instance, partners in the MRO network might only perform repairs on their own components, or be allocated a quota of complete shop visits corresponding to their program share. Membership in an MRO network offers lower margins than operating as an independent MRO provider.

Meanwhile, the so-called independent MRO market for engines such as the GE90 and V2500 continues to offer the longer-term prospect for MRO providers of participating in this steadily growing market. In particular, the increase in the aircraft volume no longer tied to the OEMs offers independent MRO providers like MTU the opportunity to gain new customers and to take over the management of the maintenance of large fleets.

MTU Maintenance Lease Services B.V., Amsterdam, Netherlands, and Sumisho Aero Engines Lease B.V., Amsterdam, Netherlands, in the field of engine leasing and the founding of MS Engine Leasing LLC., Rocky Hill, USA, for engine leasing with the partner companies in the PW1100G-JM MRO network, were created to extend the group's activities in the lucrative leasing business, and to increase the scope of services provided in the aftermarket. The positive experiences with joint venture partner Sumitomo Corporation could also generate good opportunities to establish further strategic partnerships.

Opportunities associated with product development and manufacturing

The risk report describes the risks associated with product development and manufacturing, but MTU's ongoing development activities also open the way to new business opportunities. For example, the new technologies and materials developed by MTU to improve the performance of its products create opportunities for the company to acquire new partnership roles in future engine programs, and thereby maintain a balanced product portfolio covering engines at all different stages of their lifecycle.

The risk report also refers to the challenges involved in ramping up new programs, and here again these challenges can be transformed into opportunities. Production processes and systems can be optimized and new, cutting-edge manufacturing technologies introduced. The risk analyses carried out in order to safeguard production ramp-up, and the measures adopted on the basis of those analyses, can lead to lasting process improvements. The effects of these improvements can not only be felt in new programs, but can also be transposed to existing ones. That leads, for example, to further cost reductions and enhanced delivery reliability.

Shop-floor management and the application of lean management methods entail the continuous enhancement of management tools and management behavior, which results in greater transparency and less wastage in communication and information processes, helps achieve ambitious targets, and makes for faster problem-solving and more lasting improvements. It helps shorten the time needed to respond to deviations from plan and enables the company to find structured and

sustainable solutions to problems, making it possible to put in place stable processes and optimize resource deployment. Heightened transparency and efficient communication lead to an altered understanding of leadership and a new corporate culture.

Shop-floor management underpins continuous improvement at all levels and safeguards goal achievement in the long term.

Other opportunities

As a large part of the company's revenues are based on contracts invoiced in U.S. dollars – especially in the commercial engine business and commercial MRO – a strengthening of the U.S. dollar against the euro would improve MTU's earnings. If energy prices were to stabilize or retreat to a lower level, and if commodity prices were to fall, this would have a positive effect on MTU's cost structure and hence on its business results.

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Other opportunities are listed in the SWOT analysis presented below. See the risk report for information on how the opportunities identified can be exploited and the associated risks avoided.

Overall assessment of opportunities

At December 31, 2017, the opportunities identified by MTU had not changed substantially compared with the end of the previous year. MTU has taken all the organizational measures necessary to recognize potential opportunities in good time and respond to them adequately. MTU applies the same methods in its assessment of specific opportunities as it does when evaluating risks. As a conservative approach is taken to the identification of risks and opportunities, the opportunities are necessarily limited compared with the risks. In the process of identifying opportunities, a number of smaller opportunities (< € 10 million) were established. As these are not part of the internal top risk reporting used to prepare this report, no other quantifiable opportunities have been identified in respect of 2018 beyond those in the plan. Moreover, due to the long cycles on which MTU's business model is based, the company does not foresee the emergence of any opportunities in the immediately following years because the future engine programs (and especially the GTF programs) are currently still in the development phase or in the early stages of production. These opportunities are largely accounted for in the planning.

MTU does not currently foresee any fundamental changes in its opportunities.

SWOT analysis

The results of an analysis of the main strengths, weaknesses, opportunities and threats (SWOT) identified in the course of MTU's planning and risk management processes are as follows:

SWOT analysis of the MTU group

Corporate	Market
Strengths	**Opportunities**
Technological leadership – OEM: Low-pressure turbine and high-pressure compressor (2-module strategy) – MRO: expertise in high-tech repairs	Growing market in both operating segments
Balanced engine portfolio across all market segments and life-cycle phases	Excellent positioning in the regional jet, narrowbody and widebody segments
Long-term contracts in the OEM and MRO business involvement in consortia and cooperative ventures	Export opportunities for military engine applications
Participation in aftermarket networks of new programs as well as coverage of all aftermarket services (e.g. leasing)	Growth potential in the MRO and OEM-IGT market (incl. fracking and new applications for energy generation)
Quality and supplier dependability form the basis for reliable partnerships	Greater exploitation of synergies between areas of commercial business (Integration MRO in new engine business)
	Positive changes in U.S. dollar exchange rate
Weaknesses	**Threats**
High dependency on U.S. dollar	Changes to aftermarket business models – Price competition in maintenance – Market-entry barriers for OEMs (licenses) – Changes to price and demand in spare parts business
Dependency on decisions of consortium partners	Entry of new participants in engine market
Partnerships focused on only two OEM manufacturers in the commercial market	Fundamental changes in and higher complexity of aircraft engine technologies
Higher wage levels at the traditional manufacturing sites	Additional development costs and contractual penalties due to technical difficulties with new engine types
	Loss of customer satisfaction in connection with new products
	Negative changes in U.S. dollar exchange rate

Rocky Hill
USA

not part of the audited consolidated financial statements and combined management report

True partners in MTU's global network: MTU Aero Engines North America and its engineering experts

Rocky Hill
USA

True partners in MTU's global network: MTU Aero Engines North America and its engineering experts

ROCKY HILL

MTU Aero Engines North America in Rocky Hill, with its approximately 170 employees, is a keystone in MTU's global development network. The company's engineering specialists apply their expertise to tasks ranging from mechanical design, development and structural mechanics to supplier management, validation, inspection and testing. MTU AENA also offers its wide range of engineering services to other customers in the aviation and power generation industries.

Rocky Hill, Connecticut, is a peaceful town in a region famous for its verdant pastures, clear-flowing rivers, and the magnificent display of color associated with New England's Indian summer. But this natural beauty was not the reason why MTU Aero Engines North America (AENA) chose this location: the decisive factor was its proximity to the Pratt & Whitney headquarters in East Hartford, Connecticut. This engine manufacturer is one of MTU's closest partners. "Our collaboration with Pratt & Whitney plays an essential role in the work we do. The company is not only a partner in new engine development programs but also a major customer for our engineering services," says Neeraj Rai, business development manager at MTU AENA.

A diverse portfolio of services

MTU's U.S. subsidiary is home to a wealth of engineering know-how and experience. "The design team we have built up in the United States develops innovative solutions, creates simulations of everything from discrete components to an entire complex system, and is capable of managing a whole project from end to end. Our company does everything it can to meet the customer's requirements," says Rai.

The great advantage is that the people at MTU speak the same language as their customers. "As well as being well versed in the art and science of engineering, we also understand the reality of

"As well as being well versed in the art and science of engineering, we also understand the reality of other challenges faced by our customers."

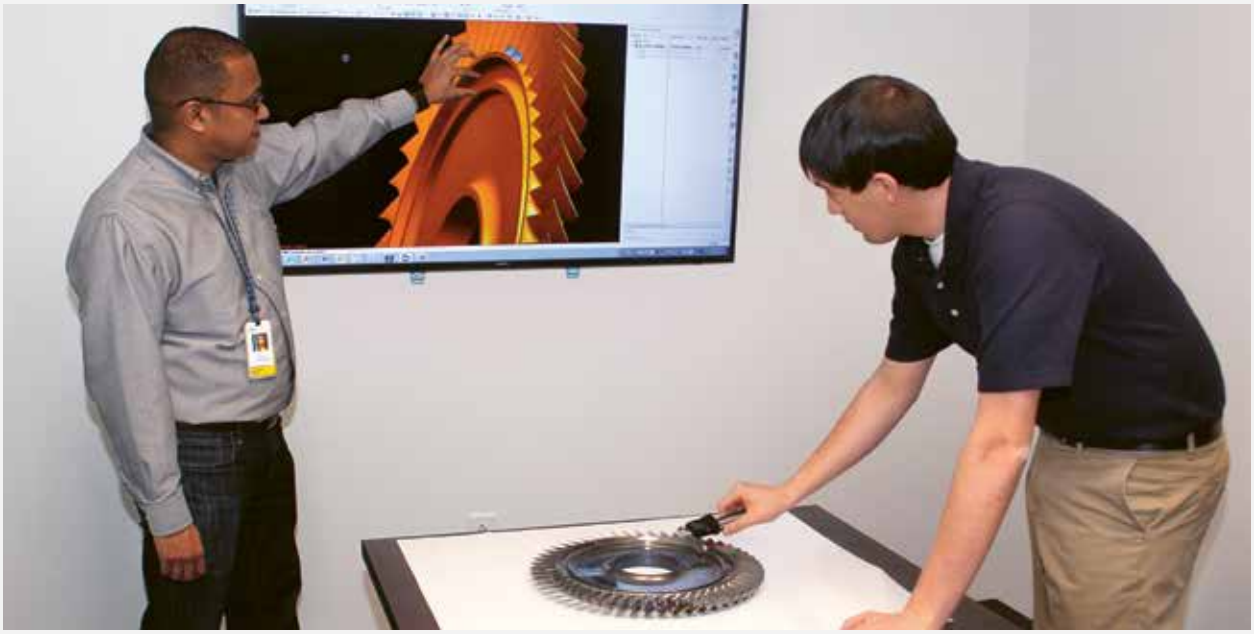
Jonathan Leach, CEO and President of MTU AENA

other challenges such as time pressure, cost sensitivities, export control requirements, and quality imperatives," says Jonathan Leach, president and CEO of MTU AENA. "Our customers turn to us for a variety of reasons, a major one being MTU's outstanding reputation as an engineering services provider." MTU AENA's team of engineering professionals has extensive experience in everything from conceptual design, detail design, project management and test/validation from entry-into-service through post-service support. Engineers at AENA recently identified a cost savings of $700,000 to a key customer by implementing an automation tool within their TeamCenter environment. In the Aftermarket Engineering services area, AENA has leveraged its valuable knowledge of repair writing for aerospace components to develop unique repairs and manuals for a customer in the industrial aero-derivative engine business.

A local partner

With their valuable store of knowledge and experience, the members of the Rocky Hill team are an important element in MTU's global development network. MTU AENA provides support to projects conducted jointly by MTU and its OEM partner Pratt & Whitney. The chief aim of these projects is to develop quieter, more fuel-efficient and greener aircraft engines. The current focus is on enhancements to the PW1100G-JM Geared Turbofan™ engine. The high-pressure compressor developed in collaboration with Pratt & Whitney and MTU's own high-speed, low-pressure turbine will help to reach this goal. Improving them is no easy task, because both components already have a very high degree of efficiency, an important factor when aiming to reduce fuel consumption. It will take a lot of hard work on the finer details to achieve even better engine performance. This calls for genuine teamwork—something that the MTU AENA engineers excel at: both when working with their colleagues in Europe and with their local partner in the United States.

MTU AENA recently completed a major renovation project, adding 8,300 square feet of office space. This will allow the company to support the needs of its growing customer base, including other MTU locations.



Testing down to the finest detail: All weak points are thoroughly analyzed to find ways of making sustainable improvements.

The internal control and risk management system in relation to the group accounting process

The current recommendations of German Accounting Standard No. 20 (DRS 20) have been applied in this section of the combined management report concerning the main features of the accounting-related internal control and risk management system.

Objectives and components

The Executive Board, Supervisory Board and Audit Committee of MTU attach the greatest importance to ensuring the regularity, accuracy and reliability of MTU's financial reporting. The accounting-related internal control and risk management system, which provides the yardstick for the MTU group's financial statements, helps ensure that these internal and external accounting requirements are systematically complied with. The Executive Board of MTU bears overall responsibility for establishing and refining the required control and monitoring systems. The systems are tailored to the MTU group's business model and company-specific requirements, and are an important part of the comprehensive approach to corporate governance that defines the basic framework for creating sustainable value for shareholders, customers, employees and the public.

- The accounting-related risk management system (RMS) is an integral part of the group's comprehensive company-wide risk management system. It forms the basis for the uniform and appropriate handling of risks and for communicating them within the group. The risks entailed in financial reporting at group level are among the corporate risks to be monitored as a whole.

  The design of the accounting-related internal control system (ICS) at MTU meets the requirements of the German Act to Modernize Accounting Law (BilMoG), the definition provided by the Institute of Public Auditors in Germany (Institut der Wirtschaftsprüfer IDW e.V.), the internationally recognized and established framework of the Committee of Sponsoring Organizations of the Treadway Commission (COSO I), and the features specific to MTU. MTU understands an internal control system (ICS) to be the principles, procedures and measures introduced at the company by its management that are aimed at the organizational implementation of the decisions of management to:
  - safeguard the effectiveness and economic efficiency of business operations – which also includes protecting the company's assets,
  - ensure the regularity and reliability of internal and external accounting, and
  - comply with statutory regulations relevant to the company.

- The internal auditing system, which is process-independent, plays an important role in checking the effectiveness of, and improving, the accounting-related ICS and RMS. The corporate audit department of MTU assesses, and helps to enhance, the controlling and monitoring systems. It is also considered to have an advisory function, contributing toward improving business processes and, ultimately, the effectiveness of the internal control system. The rules of procedure of the corporate audit department comply with national and international requirements as laid down by the Deutsches Institut für Interne Revision and the Institute of Internal Auditors. The corporate audit department is also bound by the code of professional ethics. The administrative standards of the internal auditing department are available to all employees for perusal on MTU's intranet.

- The Audit Committee of the Supervisory Board deliberates on risk management and on the findings of internal auditing. In accordance with Section 107 (3) Stock Corporation Act (AktG), as amended by the German Accounting Law Modernization Act (BilMoG), the Audit Committee is responsible also for monitoring the effectiveness of the risk management system, the internal control systems, the internal auditing systems, the financial reporting process and the audit of the financial statements.

Main features

- MTU has a clearly defined management and corporate structure. Key functions spanning more than one business unit are managed centrally. The individual subsidiaries nevertheless enjoy an adequate level of autonomy.
- The integrity and responsibility of all employees, also in terms of finances and financial reporting, are ensured by their undertaking to observe the groupwide code of conduct.
- An adequate system of guidelines has been drawn up and is updated as required.
- The departments and business units involved in the accounting process are suitably equipped and regularly trained both in quantitative and qualitative terms.
- The IT systems are protected against unauthorized access by appropriate installations in the IT area. As far as possible, standard software is used in the finance systems area. Within the framework of the comprehensive IT strategy and the IT architecture, the IT system's application controls are reviewed internally and externally on a regular basis against a background of a high level of automatic (plausibility) checks. The general IT controls are checked during internal and external IT audits.
- Suitable controls are in place in all accounting-relevant processes, such as dual control during detailed analytical checks and programmed plausibility checks in accounting or during the consolidation process.
- The consolidated financial statements and all financial data submitted for inclusion by the group companies are audited by an external auditor once a year. The same auditor also reviews the condensed consolidated financial statements and interim group management report in the half-year financial report.
- In addition, accounting-relevant processes are checked by the process-independent corporate audit department.
- The subsidiaries report directly to the group accounting department, to which they submit their annual and monthly financial statements. This information is used to prepare the consolidated financial statements in accordance with IFRSs, which are compiled in consultation with the business administration departments of the group companies.
- The financial data communicated by the group companies for inclusion in the consolidated financial statements are processed and validated on a decentralized basis by the respective business administration departments, taking the groupwide reporting guidelines into account. As a supplementary control measure, (plausibility) checks of the reported data are carried out by the group accounting department during the compilation of its monthly reports and during the consolidation process in connection with the consolidated financial statements.
- The group accounting department is also the central point of contact and controlling body for reporting issues at group level or within individual subsidiaries and joint ventures. If necessary, external consultants are called on for support.
- All subsidiaries and joint ventures are obligated to report their business figures to the group in a standardized reporting format on a monthly basis, and the reported data are compared with the planning figures. This allows the company to implement measures to identify risks and limit their consequences in good time.

Disclosures in connection with the takeover directive

The following disclosures are made pursuant to Section 315a of the German Commercial Code (HGB) (takeover directive implementation). Items of Section 315a of the German Commercial Code (HGB) that are not met at MTU Aero Engines AG are not mentioned here.

Composition of subscribed capital

The company's subscribed capital (capital stock) amounts to € 52,000,000 and is divided into 52,000,000 registered non-par-value shares. All shares have equal rights and each share entitles the holder to one vote at the Annual General Meeting.

Restrictions concerning voting rights and the transfer of share ownership

At December 31, 2017, MTU held 500,158 treasury shares (2016: 643,897). No voting rights are exercised in respect of treasury shares. The articles of association of MTU Aero Engines AG do not contain any restrictions concerning voting rights or the transfer of share ownership. The Executive Board has no knowledge of any agreement between shareholders that could give rise to any such restrictions.

Rules governing the appointment and dismissal of members of the Executive Board and amendments to the company's articles of association

The rules for the appointment and dismissal of members of the Executive Board are based on Sections 84 and 85 of the German Stock Corporation Act (AktG) and Section 31 of the German Co-Determination Act (MitbestG) in conjunction with Article 5 of the company's articles of association.

All amendments to the articles of association require a resolution on the part of the Annual General Meeting with a majority of at least three quarters of the voting stock attending, pursuant to Section 179 of the German Stock Corporation Act (AktG). The right to add amendments of a purely formal nature, for instance changes to the share capital as the result of utilization of the authorized capital, is devolved to the Supervisory Board under the terms of Article 13 of the articles of association.

Authorizations conferred on the Executive Board, especially concerning the issue and purchase of shares

Authorized capital

In accordance with Article 4 (5) of the articles of association, the Executive Board is authorized until April 14, 2020, to increase the company's capital stock by up to € 15.6 million, with the prior approval of the Supervisory Board, by issuing, either in a single step or in several steps, new registered non-par-value shares in return for cash contributions (Authorized capital 2015).

Conditional capital

In accordance with Article 4 (6) of the articles of association, the company's capital stock may be conditionally increased by up to € 5.2 million through the issue of up to 5,200,000 new registered non-par-value shares. The purpose of this conditional capital increase is to issue shares to owners or creditors of convertible bonds and / or bonds with warrants in accordance with the authorization granted to the company under a resolution passed by the Annual General Meeting on April 15, 2015. Shares may be issued at a conversion price or warrant exercise price determined on the basis of the conditions laid down in the relevant authorization.

The Executive Board is authorized until April 14, 2020, to issue, in a single step or in several steps and with the prior approval of the Supervisory Board, bearer convertible bonds and / or bonds with warrants (collectively referred to as "securities"), with or without maturity date, with a total nominal value of up to € 500 million, and to grant the owners of convertible bonds and / or bonds with warrants the right, obligation or option to convert them into registered non-par-value shares of the company representing a stake in the capital stock of up to € 5.2 million under the conditions established for the issue of convertible bonds or bonds with warrants. The bonds may be issued in return for cash contributions only. They may be issued in euros or – to an equivalent value – in any other legal currency, for instance that of an OECD country. They may also be issued by an affiliated company in which MTU holds a controlling interest. In such cases, and subject to the prior approval of the Supervisory Board, the Executive Board is authorized to act as guarantor for the securities, and to grant the owners of the securities the right, obligation or option to convert them into new registered non-par-value shares in MTU. In 2016, MTU made use of this authorization to increase the company's capital stock by issuing a convertible bond with a nominal value of € 500 million. For more information about this bond issue, please refer to the section of this combined management report dealing with the business environment, under the heading "Financial situation", and to Note 28 to the consolidated financial statements (Financial liabilities).

→ further information on page 215

Resolution concerning the authorization to purchase and use treasury shares pursuant to Section 71 (1) item 8 of the German Stock Corporation Act (AktG) and to exclude subscription rights
By resolution of the Annual General Meeting of April 15, 2015, the company was authorized:

- to purchase treasury shares accounting for a proportion of up to 10% of the company's issued capital stock, as applicable on the date of the resolution, during the period from April 15, 2015, through April 14, 2020, pursuant to Section 71 (1) item 8 of the German Stock Corporation Act (AktG). At no point in time may the value of the acquired shares, together with other treasury shares in the company's possession or which are assigned to it pursuant to Section 71a et seq. of the German Stock Corporation Act (AktG), exceed 10% of the company's capital stock. At the discretion of the Executive Board, the shares may be purchased through the stock exchange or by means of a public offering addressed to all shareholders (or – if legally acceptable – through an open invitation to submit offers for sale). The shares must be sold in return for proceeds that do not lie more than 10% above or below the quoted share price, net of any supplementary transaction charges. In the case of a sale through the stock exchange, the reference for the quoted share price as defined in the above ruling is the average value of share prices in the closing session of Xetra trading (or a comparable successor system) on the last three trading days prior to the publication of the offering or invitation. In the case of shares purchased by means of a public offering addressed to all shareholders (or an open invitation to submit offers for sale), the reference for the quoted share price is the average value of share prices in the closing session of Xetra trading (or a comparable successor system) on the last three trading days prior to the publication of the offering or invitation. In the event of substantial fluctuations in the share price, the Executive Board is authorized to publish a new public offering or invitation to submit offers for sale, based on a recalculated average value of share prices according to the previously mentioned formula. The volume of the offer can be limited in the case of shares purchased by means of a public offering addressed to all shareholders (or an open invitation to submit offers for sale). If the take-up of the offering (or the total number of offers) exceeds this volume, the purchase must be transacted in proportion to the number of shares offered. Preferential treatment may be given to small packages (up to 100 shares) offered for sale. Further conditions may be imposed in the offering or invitation to submit offers;
- to sell the purchased treasury shares in another manner than through the stock exchange or by means of a public offering addressed to all shareholders, on condition that the shares are sold in return for cash contributions at a price that does not lie significantly below the market price of similarly entitled MTU shares at the time of sale;
- with the prior approval of the Supervisory Board, to sell the purchased treasury shares in another manner than through the stock exchange or by means of an offering addressed to all shareholders if the treasury shares are sold to program participants in conjunction with the company's stock option programs and those participants are, or were, employees or officers of the company or one of its affiliated companies. If shares are to be issued to active or former members of the MTU Executive Board under the terms of the company's stock option programs, the Supervisory Board is authorized to transact this issue;

- to use the purchased treasury shares as partial or complete payment in conjunction with business combinations or the acquisition, whether direct or indirect, of businesses, parts of businesses or equity investments;
- with the prior approval of the Supervisory Board, to use the purchased treasury shares to discharge obligations or exercise rights relating to convertible bonds, bonds with warrants, certificates of beneficial interest or income bonds (or combinations of such instruments) issued by the company or by a dependent group company;
- with the prior approval of the Supervisory Board and without any requirement for a further resolution to be passed by the Annual General Meeting, to retire purchased treasury shares in whole or in part. Their retirement may be effected by employing a simplified procedure without any capital reduction, by adapting the actuarial value of the outstanding portion of shares to that of the company's stock capital. The retirement may be limited to a defined fraction of the purchased shares. The authorization to retire shares may be utilized on one or more occasions. If the simplified procedure is employed, the Executive Board is authorized to amend the number of outstanding shares stated in the articles of association.

The above-stated authorizations may be exercised on one or more occasions, in whole or in part, singly or in combination. They may be exercised also by group companies as defined in Section 17 of the German Stock Corporation Act (AktG).

The subscription rights of existing shareholders in respect of these treasury shares are excluded insofar as the shares are utilized in the manner described in the above-stated authorizations.

The authorization to purchase treasury shares granted to the company on April 22, 2010, was revoked as of the effective date of this new authorization. The authorization to use the treasury shares purchased under the terms of the above-mentioned earlier resolution dated April 22, 2010, remains in force.

Significant agreements relating to change of control subsequent to a takeover bid

MTU Aero Engines AG issued a registered bond in June 2013 and a note purchase agreement in March 2014. These grant the creditor a right of early repayment in the event that a third party assumes control of over 50 % of the company's share capital with voting rights and this change of control has a negative impact on the company's credit rating.

The convertible bond issued by MTU Aero Engines AG in May 2016 contains the rules summarized below with regard to a change of control: In the event of a change of control, the bond terms grant bondholders the right to exercise their conversion right within a specific period of time and at an adjusted conversion rate. In the event of control being taken over, bondholders can redeem their bonds prematurely at the terms described more closely in the bond conditions. A "change of control" shall be deemed as when a change of control occurs or a mandatory takeover offer is published pursuant to Section 35 (2) p. 1, Section 14 (2) p. 1 of the German Securities Acquisition and Takeover Act (WpÜG) or, in the case of a voluntary takeover offer, if more than 30 % of MTU Aero Engines AG's voting rights are legally or beneficially owned by the bidder or attributed to it pursuant to the bond conditions. If one or more persons in the sense of Section 22 (2) WpHG acquire 50 % of the voting rights of MTU Aero Engines AG, this shall represent an "acquisition of control".

In October 2013, MTU Aero Engines AG agreed on a revolving credit facility with a banking syndicate (extended and increased in September 2017), which provides for a right of termination for the lenders in the event that one or more persons assume control of MTU Aero Engines AG or acquire more than 50 % of the company's issued capital.

MTU Aero Engines AG has risk and revenue sharing agreements with an engine manufacturer containing clauses that allow the risk and revenue sharing agreement to be converted into a long-term supplier contract in the event that a major competitor of the contracting party acquires 25 % or more of the company's voting rights or assets, thus constituting a controlling interest.

In addition, MTU Aero Engines AG has a cooperative agreement with another engine manufacturer. Under this agreement, that manufacturer is entitled to terminate the contract for cause in the event that one of its competitors acquires more than 50 % of the company's voting rights. MTU Aero Engines AG has further cooperative agreements with the same engine manufacturer. Under these agreements, that manufacturer is entitled to terminate the contract for cause in the event that one of its competitors acquires more than 30 % of the company's voting rights.

MTU Aero Engines AG also has equity investments in various joint ventures with other engine manufacturers, the purpose of which is to cooperate in the development and production of aircraft engines. According to the provisions of the corresponding agreements, MTU Aero Engines AG's share in the joint venture may be withdrawn and its participation in the accompanying cooperative agreements terminated if MTU Aero Engines AG is taken over by a competitor of the partners in these consortia.

It is standard market practice to confer contractual rights of this kind. Should an event meeting any of the above definitions of change of control take place, the exercise of rights ensuing from these agreements could have a substantial impact on MTU's net assets, financial position or operating results.

Other agreements

Claims for compensation in the event of a takeover bid

Pursuant to the Executive Board contracts in effect since January 1, 2016, a change of control is deemed to have occurred when a shareholder acquires a majority interest in the company and this entails material disadvantages for members of the Executive Board. Material disadvantages are in particular if the Executive Board member is dismissed, if their responsibilities and duties are significantly altered, or if the Executive Board member is asked to accept a reduction in their employment benefits or to agree to a premature termination of their contract. In such case, each member of the Executive Board shall have a special right of termination, which is to be exercised within a period of six months, with a period of notice of three months to the end of a month. If a member of the Executive Board makes use of this right, or if the executive employment contract is terminated by mutual consent within nine months of the change of control, the Executive Board member shall receive a severance payment corresponding to the benefits that would otherwise have been awarded up to the date on which their contract would normally have expired. For the calculation of the severance payment, 100 % fulfilment of the management objectives is agreed upon with regard to the variable compensation components. The maximum amount of the severance payment is limited to three times the annual target direct compensation.

No comparable agreements have been made with regard to other employees.

Other disclosures

Corporate governance statement

Declaration of conformity

The executive and supervisory boards of listed companies issue an annually renewed declaration stating that the recommendations of the Government Commission on the German Corporate Governance Code have been and are being complied with, where necessary citing those recommendations that have not been or are not being applied. The declaration of conformity of MTU Aero Engines is included in the corporate governance section of this Annual Report.

→ further information on page 21

There is also a section devoted to Corporate Governance on the MTU website at www.mtu.de under Investor Relations.

Management practices extending beyond statutory requirements

A full description of management practices that extend beyond statutory requirements is provided in the corporate governance report published as part of this 2017 Annual Report.

→ further information on page 22

Working procedures of the Executive Board and the Supervisory Board

A description of the working procedures of the Executive Board and Supervisory Board is provided in the corporate governance report.

→ further information on page 22

German law on equal participation of women and men in leadership positions

In the context of the new German law on equal participation of women and men in leadership positions (so-called “Frauenquote”), MTU Aero Engines has set itself the following goals:

Firstly, the proportion of women holding seats on the Supervisory Board of MTU Aero Engines AG is expected to increase to at least 30% when positions are vacated and refilled. This quota applies both to the number of shareholder representatives and to the number of employee representatives. Two women candidates will be presented for election to the Supervisory Board as shareholder representatives at the 2018 Annual General Meeting. Currently, women make up 16.7% of the membership of the Supervisory Board.

Secondly, the overall proportion of women in leadership positions at the company’s three locations in Germany is expected to increase to 13% by June 2022, up from 9.7% at the reference date of December 31, 2017. MTU was unable to meet the target of 11% set for 2017. This was in large part due to the high number of women executives absent due to maternity leave, and voluntary departures. MTU’s talent management program gives priority to promoting women at all levels of the corporate hierarchy. Increasing the number of women in the general workforce and thus increasing the pool of female candidates for management positions is a long-term process. As regards the composition of the Executive Board of MTU Aero Engines AG, the company plans to increase the proportion of women to 25% by 2022. For more information on MTU’s diversity policy, please see the corporate governance report.

→ further information on page 22

Reference to management compensation report

The compensation awarded to members of the Executive Board is made up of fixed and variable components. A more detailed description, including a table of individual members' compensation entitlements, can be found in the corporate governance section of this Annual Report. The management compensation report forms an integral part of the group management report.

→ further information on page 32

Directors' dealings

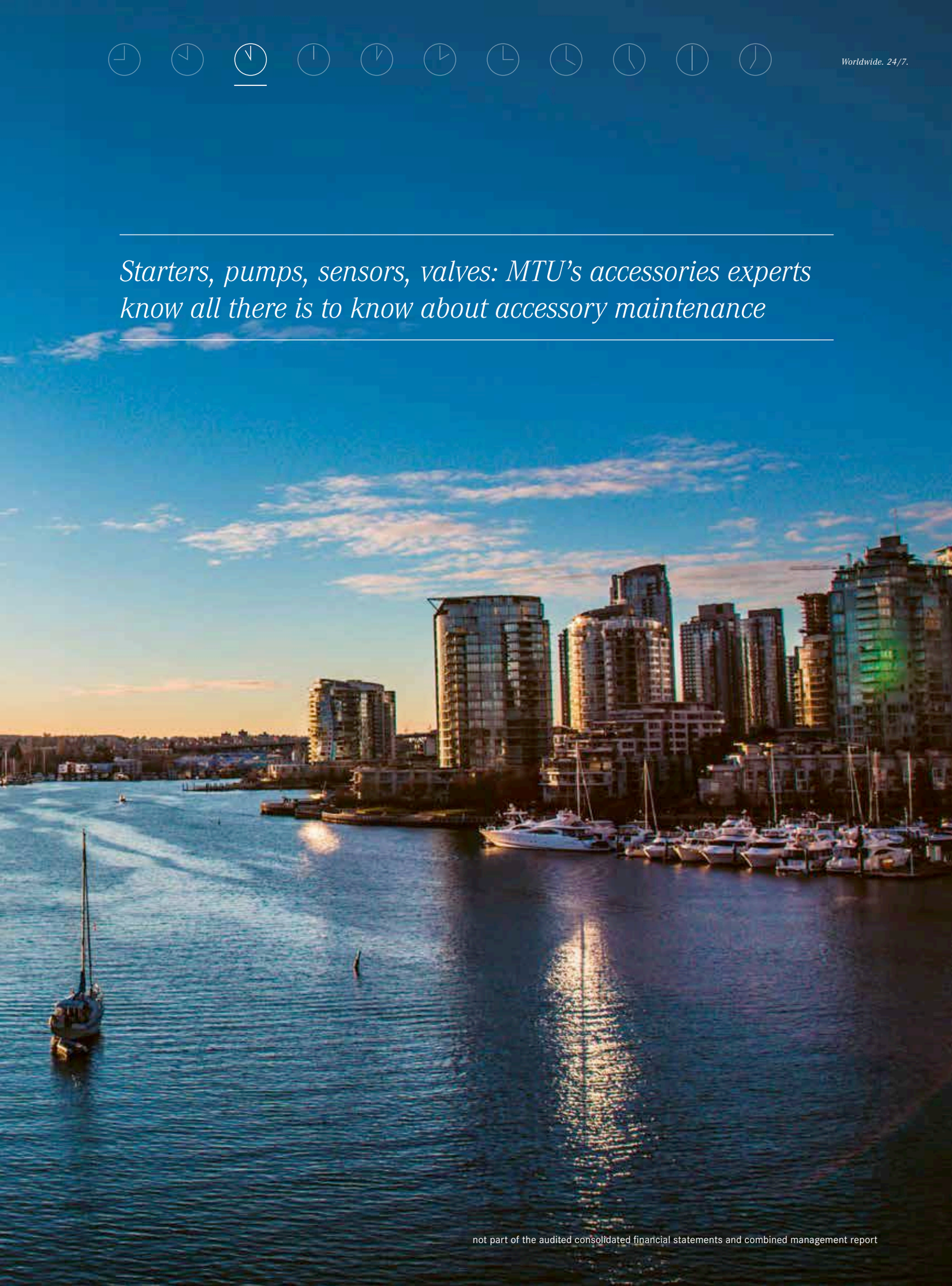
Pursuant to Section 15a of the German Securities Trading Act (WpHG), members of the Executive Board and the Supervisory Board have a legal obligation to disclose transactions involving the purchase or sale of shares in MTU Aero Engines AG, Munich, or of related financial instruments, on condition that the total amount of the transactions undertaken by a board member or related persons reaches or exceeds € 5,000 within a single calendar year. These transactions were posted on the MTU website at www.mtu.de and published in the register of companies.

The total number of shares in MTU Aero Engines AG, Munich, held by members of the company's Executive Board and Supervisory Board at December 31, 2017, equaled less than 1% of the company's share capital (at December 31, 2016, less than 1%).

Richmond

Canada

Starters, pumps, sensors, valves: MTU's accessories experts know all there is to know about accessory maintenance



Richmond
Canada

Starters, pumps, sensors, valves: MTU's accessories experts know all there is to know about accessory maintenance

BACKGROUND INFORMATION

Now also in Canada: V2500 MRO

Hannover, Zhuhai and now also Richmond (as of 2017). MTU now offers MRO services for the V2500 in three locations–for even greater proximity to the customer and shorter turnaround times.

Vital engine components

It's 11 p.m. in central Europe, or 2 p.m. local time in Richmond, British Columbia, Canada. Here, right on the doorstep of Vancouver and its international airport, there's a lively buzz of activity at MTU Maintenance's Accessories Repair Center. Various defective accessories have been announced and arrive punctually for maintenance. If you imagine an aero engine – with its compressors, turbines and combustor – as a human heart, then its accessories could be likened to the coronary blood vessels. Just as the human heart is surrounded by a network of arteries, the engine is surrounded by a range of supporting components. The analogy continues: accessories are critical to the functioning of the whole, as in the human heart. Should these accessories fail, the engine is at risk of suffering something akin to a heart attack: in the worst case, the aircraft must remain grounded – and meanwhile, the costs increase with every passing minute. Christian Ludwig and his team are there to do all they can to avoid such a scenario. "And if it does happen, we're the ones who can get the aircraft back in the air fastest," says the Director of Operations, Accessories at MTU Maintenance Canada.

450 repair procedures for all accessories

Founded in1998 and currently employing a staff of around 400, the MTU subsidiary offers an extensive portfolio of accessory repairs for everything from business jet engines such as the CF34-3 to the mighty GE90 that powers the Boeing 777. At the Accessories Repair Center, MTU's team of some 100 engineers takes the units apart, gives them a good clean, performs visual inspection and tests on the components. Repairs are then carried out, followed by re-assembly and final testing, before the accessory is sent back to the customer. "The biggest challenge when it comes to accessories is the enormous complexity involved," says Ludwig, mindful of the fact that one single engine has an average of 80 different accessories. Accordingly, in Rich-

Each engine has some 80 accessories–and MTU's expertise covers the entire spectrum.

MTU Maintenance Canada possesses expertise in some 450 repair techniques.

mond, repairs draw on some 450 different procedures. Speed is of the essence when carrying out repair work and this is precisely the Canadians' strong point: they are so well-organized that defective accessories can be replaced with functioning ones within between four and 24 hours.

In addition to traditional repair work in its own shop, MTU also offers management of line replaceable units (LRUs). This is an all-inclusive service package whereby MTU takes care of all an airline's accessories and replaces specific accessory components on site during routine operations, with the assistance of MTU's local airline support team.

New test cell for improved service

And the service portfolio is continuously expanding: in spring 2017, MTU Maintenance Canada inaugurated a new test cell for pneumatic starters. For customers, this means an even more comprehensive service from a single source, faster turnaround times, improved logistics and greater cost efficiency.

"The biggest challenge when it comes to accessories is the enormous complexity involved."

Christian Ludwig,
Director of Operations, Accessories
at MTU Maintenance Canada

Consolidated financial statements

Notes to the consolidated financial statements

Consolidated income statement

Consolidated income statement

in € million	(Note)	2017	2016
Revenues	**(1.)**	**5,036.3**	**4,732.7**
Cost of sales	(2.)	–4,266.4	–4,074.8
Gross profit		**769.9**	**657.9**
Research and development expenses	(3.)	–76.6	–71.1
Selling expenses	(4.)	–102.2	–104.0
General administrative expenses	(5.)	–76.8	–70.8
Other operating income	(6.)	7.9	17.2
Other operating expenses	(6.)	–10.8	–7.1
Profit/loss of companies accounted for using the equity method	(7.)	42.4	28.6
Profit/loss of companies accounted for at cost	(7.)	1.5	2.1
Earnings before interest and tax (EBIT)		**555.3**	**452.8**
Interest result	(8.)	–7.2	–11.9
Financial result on other items	(9.)	–32.8	–25.3
Financial result		**–40.0**	**–37.2**
Earnings before tax		**515.3**	**415.6**
Income taxes	(10.)	–133.5	–103.0
Net income		**381.8**	**312.6**
Thereof:			
Owners of MTU Aero Engines AG		378.2	312.2
Non-controlling interests		3.6	0.4
Earnings per share in €			
Basic (EPS)	(11.)	7.35	6.09
Diluted (DEPS)	(11.)	6.88	5.83

Consolidated statement of comprehensive income

Consolidated statement of comprehensive income

in € million	(Note)	2017	2016
Net income		**381.8**	**312.6**
Exchange differences arising from the translation of foreign operations		–9.7	–5.5
Financial instruments designated as cash flow hedges		151.0	–1.6
Items that may subsequently be recycled to profit or loss		141.3	–7.1
Actuarial gains and losses on pension obligations and plan assets		12.8	–54.3
Items that will not be recycled to profit or loss		12.8	–54.3
Other comprehensive income / loss	**(24.)**	**154.1**	**–61.4**
Total comprehensive income		**535.9**	**251.2**
Thereof attributable to:			
Owners of MTU Aero Engines AG		532.9	250.8
Non-controlling interests		3.0	0.4

Consolidated balance sheet – assets

Assets

in € million	(Note)	Dec. 31, 2017	Dec. 31, 2016
Non-current assets			
Intangible assets	(14.)	2,290.1	2,234.2
Property, plant and equipment	(15.)	763.4	681.5
Financial assets accounted for using the equity method	(16.)	291.5	201.9
Other financial assets	(16.)	167.8	130.2
Other assets	(20.)	1.7	2.0
Deferred tax assets	(23.)	55.2	56.6
Total non-current assets		**3,569.7**	**3,306.4**
Current assets			
Inventories	(17.)	997.9	1,022.7
Trade receivables	(18.)	736.9	692.1
Construction contract and service business receivables	(19.)	454.0	393.2
Income tax receivables	(22.)	31.3	21.1
Other financial assets	(16.)	113.2	42.9
Other assets	(20.)	40.4	43.8
Cash and cash equivalents	(21.)	106.1	322.4
Total current assets		**2,479.8**	**2,538.2**
Total assets		**6,049.5**	**5,844.6**

Consolidated balance sheet – equity and liabilities

Equity and liabilities

in € million	(Note)	Dec. 31, 2017	Dec. 31, 2016
Equity	**(24.)**		
Subscribed capital		52.0	52.0
Capital reserves		451.2	435.5
Revenue reserves		1,651.5	1,370.9
Treasury shares		–23.1	–25.3
Accumulated other equity		–178.1	–332.8
Owners of MTU Aero Engines AG		**1,953.5**	**1,500.3**
Non-controlling interests		36.3	0.2
Total equity		**1,989.8**	**1,500.5**
Non-current liabilities			
Pension provisions	(25.)	847.6	860.6
Other provisions	(27.)	37.6	23.4
Financial liabilities	(28.)	936.6	1,056.4
Other liabilities	(31.)	16.9	
Deferred tax liabilities	(33.)	87.4	23.5
Total non-current liabilities		**1,926.1**	**1,963.9**
Current liabilities			
Pension provisions	(25.)	23.1	22.7
Income tax liabilities	(26.)	3.6	6.8
Other provisions	(27.)	855.8	684.3
Financial liabilities	(28.)	299.9	645.2
Trade payables	(29.)	562.8	634.9
Construction contract and service business payables	(30.)	321.9	344.2
Other liabilities	(31.)	66.5	42.1
Total current liabilities		**2,133.6**	**2,380.2**
Total equity and liabilities		**6,049.5**	**5,844.6**

Consolidated statement of changes in equity

Consolidated statement of changes in equity

in € million	Subscribed capital	Capital reserves	Revenue reserves	Treasury shares	Accumulated other equity: Translation differences arising from the financial statements of international entities	Accumulated other equity: Actuarial gains and losses [1]	Accumulated other equity: Financial instruments designated as cash flow hedges	**Owners of MTU Aero Engines AG**	Non-controlling interests	**Total equity**
Carrying amount at Jan. 1, 2016	**52.0**	**404.7**	**1,145.6**	**–30.1**	**30.7**	**–204.4**	**–97.7**	**1,300.8**	**–0.2**	**1,300.6**
Net income			312.2					312.2	0.4	312.6
Other comprehensive income					–5.5	–54.3	–1.6	–61.4		–61.4
Total comprehensive income			**312.2**		**–5.5**	**–54.3**	**–1.6**	**250.8**	**0.4**	**251.2**
Dividend payment			–86.9					–86.9		–86.9
Equity portion of convertible bond [2]		16.0						16.0		16.0
Restricted Stock Plan		3.9		1.2				5.1		5.1
MAP employee stock option program		10.9		3.6				14.5		14.5
Carrying amount at Dec. 31, 2016	**52.0**	**435.5**	**1,370.9**	**–25.3**	**25.2**	**–258.7**	**–99.3**	**1,500.3**	**0.2**	**1,500.5**
Net income			378.2					378.2	3.6	381.8
Other comprehensive income					–9.1	12.8	151.0	154.7	–0.6	154.1
Total comprehensive income			**378.2**		**–9.1**	**12.8**	**151.0**	**532.9**	**3.0**	**535.9**
Dividend payment			–97.6					–97.6		–97.6
Restricted Stock Plan		3.1		0.5				3.6		3.6
MAP employee stock option program		12.6		1.7				14.3		14.3
Carrying amount at Dec. 31, 2017	**52.0**	**451.2**	**1,651.5**	**–23.1**	**16.1**	**–245.9**	**51.7**	**1,953.5**	**36.3**	**1,989.8**

[1] Refers to pension obligations and plan assets

[2] After transaction costs and taxes

Consolidated cash flow statement

Consolidated cash flow statement

in € million	(Note)	2017	2016
Operating activities			
Net income		381.8	312.6
Depreciation / appreciation, amortization and impairment of non-current assets		196.2	177.5
Profit / loss of companies accounted for using the equity method		–42.4	–28.6
Profit / loss of companies accounted for at cost		–1.5	–2.1
Gains / losses on the disposal of assets		5.2	–3.8
Change in pension provisions	(25.)	6.8	1.7
Change in other provisions	(27.)	185.7	187.7
Other non-cash items		–43.8	35.1
Change in working capital		–206.2	–291.6
Interest result	(8.)	7.2	11.9
Interest paid		–14.5	–15.2
Interest received		4.7	0.8
Dividends received		17.8	15.1
Income taxes	(10.)	133.5	103.0
Income taxes paid		–148.0	–146.1
Cash flow from operating activities		**482.5**	**358.0**
Investing activities			
Capital expenditure on:			
Intangible assets	(14.)	–133.0	–108.1
Property, plant and equipment	(15.)	–195.4	–159.4
Financial assets	(16.)	–79.9	–99.6
Proceeds from disposal of:			
Intangible assets / property, plant and equipment	(14.)/(15.)	7.3	4.7
Financial assets	(16.)	38.6	48.4
Cash flow from investing activities		**–362.4**	**–314.0**
Financing activities			
Increase in financial liabilities	(28.)	78.1	
Proceeds from convertible bond[1)]	(28.)		495.3
Repayment of corporate bond	(28.)	–250.0	
Settlement of contingent purchase price liability for PW1000G program shares, PW 800 program shares, V2500 stake increase		–76.4	–79.2
Repayment of financial liabilities	(28.)	–1.3	–120.4
Dividend payment		–97.6	–86.9
Sale of treasury shares under the MAP employee stock option program	(28.)	14.3	14.5
Cash flow from financing activities		**–332.9**	**223.3**
Net change in cash and cash equivalents during the year		**–212.8**	**267.3**
Effect of translation differences on cash and cash equivalents		–3.5	2.0
Cash and cash equivalents at beginning of financial year (January 1)		322.4	53.1
Cash and cash equivalents at end of financial year (December 31)		**106.1**	**322.4**

[1)] After transaction costs

Reporting by operating segment

Reporting by operating segment

in € million	Commercial and military engine business (OEM) 2017	2016
External revenues	2,837.4	2,871.0
Revenues from intersegment sales	36.3	34.2
Total revenues	**2,873.7**	**2,905.2**
Gross profit	**529.0**	**422.6**
Amortization	76.4	65.5
Depreciation	82.4	76.2
Impairment loss		
Total amortization / depreciation and impairment losses	**158.8**	**141.7**
Earnings before interest and tax (EBIT)	**363.4**	**273.7**
Special impact purchase price allocation	18.6	18.7
Special impact IAE-V2500 stake increase	30.2	29.1
Earnings before interest and tax adjusted (EBIT adjusted)	**412.2**	**321.5**
Profit / loss of companies accounted for using the equity method	5.3	1.1
Carrying amount of companies accounted for using the equity method	137.9	55.8
Assets	**5,298.4**	**5,115.6**
Liabilities	**3,492.1**	**3,758.8**
Significant non-cash items	**–35.9**	**33.7**
Capital expenditure:		
Intangible assets	114.0	114.3
Property, plant and equipment	139.8	112.1
Capital expenditure on intangible assets and on property, plant and equipment	**253.8**	**226.4**
Key segment data:		
EBIT in % of revenues	12.6	9.4
EBIT adjusted in % of revenues	14.3	11.1

The key indicator used by management to measure the operating performance of each segment is earnings before interest and tax adjusted (EBIT adjusted). The contribution of companies accounted for using the equity method to EBIT adjusted amounted to € 42.4 million in the financial year 2017 (2016: € 28.6 million).

Intersegment sales are transacted on an arm's-length basis at normal market transfer prices and invoiced in the same way as transactions with external third parties. Significant non-cash items mainly comprise profit / losses from FX revaluation.

Commercial maintenance business (MRO)		Total reportable segments		Consolidation / reconciliation		MTU group	
2017	2016	**2017**	2016	**2017**	2016	**2017**	2016
2,198.9	1,861.7	5,036.3	4,732.7			5,036.3	4,732.7
86.4	52.7	122.7	86.9	–122.7	–86.9		
2,285.3	**1,914.4**	**5,159.0**	**4,819.6**	**–122.7**	**–86.9**	**5,036.3**	**4,732.7**
239.8	**234.8**	**768.8**	**657.4**	**1.1**	**0.5**	**769.9**	**657.9**
10.4	10.6	86.8	76.1			86.8	76.1
27.0	25.2	109.4	101.4			109.4	101.4
	0.1		0.1				0.1
37.4	**35.9**	**196.2**	**177.6**			**196.2**	**177.6**
191.9	**179.1**	**555.3**	**452.8**			**555.3**	**452.8**
2.5	2.4	21.1	21.1			21.1	21.1
		30.2	29.1			30.2	29.1
194.4	**181.5**	**606.6**	**503.0**			**606.6**	**503.0**
37.1	27.5	42.4	28.6			42.4	28.6
153.6	146.1	291.5	201.9			291.5	201.9
1,609.2	**1,479.6**	**6,907.6**	**6,595.2**	**–858.1**	**–750.6**	**6,049.5**	**5,844.6**
1,084.7	**994.8**	**4,576.8**	**4,753.6**	**–517.1**	**–409.5**	**4,059.7**	**4,344.1**
–8.0	**3.6**	**–43.9**	**37.3**	**0.1**		**–43.8**	**37.3**
0.8	1.1	114.8	115.4			114.8	115.4
56.9	47.3	196.7	159.4			196.7	159.4
57.7	**48.4**	**311.5**	**274.8**			**311.5**	**274.8**
8.4	9.4	10.8	9.4			11.0	9.6
8.5	9.5	11.8	10.4			12.0	10.6

There were no changes in the delimitation of the segments vis-à-vis the previous year.

For more information on segment reporting, please see Part V of these Notes (Segment information).

Analysis by products and services

Information on revenues derived from products and services

in € million	2017	2016
Commercial engine business		
Manufacturing	2,301.0	2,261.5
Other products	168.4	139.7
Total commercial engine business	**2,469.4**	**2,401.2**
Military engine business		
Manufacturing	198.9	298.8
Other products	205.4	205.2
Total military engine business	**404.3**	**504.0**
Total commercial and military engine business (OEM)	**2,873.7**	**2,905.2**
Commercial maintenance business (MRO)		
Engine maintenance, repair and overhaul	2,055.4	1,657.2
Other products	229.9	257.2
Total commercial maintenance business (MRO)	**2,285.3**	**1,914.4**
Consolidation	–122.7	–86.9
Total revenues	**5,036.3**	**4,732.7**

In the OEM segment (commercial and military engine business), revenues for other products refer to services, grants toward development costs and revenues from military maintenance contracts. In the MRO segment (commercial maintenance business), revenues from other products mainly relate to the repair of engine parts, engine leasing activities and the sale of engines and engine components.

Information on revenues from major customers

In the reporting period, three major customers each accounted for more than 10% of total group revenues. Business with the largest customer led to revenues of € 1,903.4 million (2016: € 1,609.3 million), with the second-largest customer € 894.3 million (2016: € 940.4 million) and with the third-largest € 439.7 million (2016: € 537.1 million). In each case, the revenues were generated in both operating segments.

Analysis by geographical area

Revenues according to customer's country of domicile

in € million	2017	2016
Germany	441.8	518.8
Europe	359.3	330.7
North America	3,681.2	3,495.2
Asia	280.0	199.4
Other regions	274.0	188.6
Total revenues	**5,036.3**	**4,732.7**

In 2017, approximately 73% (2016: 74%) of MTU's revenues were generated from business with customers in North America, of which the U.S. market accounted for a share of 69% (2016: 70%).

Capital expenditure on intangible assets and on property, plant and equipment

in € million	2017	2016
Germany	272.9	239.0
Europe	26.1	31.8
North America	12.5	4.0
Total capital expenditure	**311.5**	**274.8**

Approximately 88% (2016: approximately 87%) of the capital expenditure on intangible assets and on property, plant and equipment relates to expenditure by group companies in Germany.

Non-current assets

in € million	2017	2016
Germany	2,675.4	2,526.0
Europe	748.2	723.4
North America	146.1	57.0
Total non-current assets	**3,569.7**	**3,306.4**

Reconciliation to MTU consolidated earnings before tax

Reconciliation to MTU consolidated earnings before tax

in € million	2017	2016
Earnings before interest and tax (EBIT)	**555.3**	**452.8**
Interest income	5.8	0.8
Interest expenses	–13.0	–12.7
Financial result on other items	–32.8	–25.3
Earnings before tax	**515.3**	**415.6**

The cash and cash equivalents of the German group companies are managed centrally by the parent company in a cash pooling system. The parent company's operating activities are allocated to the OEM segment, which is why the associated interest income and expense mainly arises in that segment.

Kuala Lumpur

Malaysia

Blade experts from Asia: ASSB joint venture pools the expertise of two strong partners

Kuala Lumpur

Malaysia

Blade experts from Asia: ASSB joint venture pools the expertise of two strong partners

ASSB has over 500 employees

Turning old into new – blades compared

Half a million blades per year

It's 2 a.m. CET, 9 a.m. local time in Kuala Lumpur. Even at this time of the morning, the humidity is oppressive, causing the temperature in Malaysia's capital to feel much higher than the thermometer shows. Europeans need a while for their bodies to adapt to the unaccustomed meteorological conditions. Dutchman Wim van Beers has grown used to the climate. In spring 2017, he became the new Managing Director of Airfoil Services Sdn. Bhd. (ASSB), a 50/50 joint venture between MTU and Lufthansa Technik, which specializes in the repair of engine blades. "With over 500 employees, we repair some 550,000 engine blades here per year," van Beers says. ASSB's experts take care of high-pressure compressor and low-pressure turbine engine blades for long-, short- and medium-haul aircraft such as the CF6-80C, the GP7000 or engines from the CFM56 and V2500 families.

World's first shop offering the full range of repairs

Customers who entrust their engines to the maintenance shop in Kota Damansara, near Kuala Lumpur in Malaysia, which has been jointly managed since 2003 by MTU and Lufthansa Technik, benefit from over 25 years of experience. The primary objective of the joint venture is to leverage synergies and generate economies of scale in the area of blade repair. Both partners contribute a basic volume of blades and incorporate

“The joint venture has given rise to extensive technological expertise, substantially increased our repair capacity and dramatically expanded the business. Revenue in Malaysia has increased more than nine-fold since 2003.”

Wim van Beers, Managing Director of Airfoil Services Sdn. Bhd.

their repair development know-how into training and quality improvement. “The joint venture has given rise to extensive technological expertise and has also substantially increased our repair capability,” van Beers says. The result: ASSB was the world’s first shop able to offer the full range of repairs, which has proved instrumental in its success: “We have dramatically expanded the business and increased our revenue more than nine-fold since 2003,” van Beers adds. The addition of a new facility in 2007 has also significantly enlarged the location’s repair capacities.

High-tech repair techniques for engine blades

Besides boasting a state-of-the-art machine pool, ASSB relies on high-tech repair techniques. In 2017, the ultra-modern shop put a second robot for thermal surface coating into operation. Procedures such as adaptive milling and X-ray inspections are extensively used. The advantage for customers: blades that are as good as new and shorter turnaround times—even when repair volumes are running high. “Especially the quantities of blades we receive from third parties can sometimes be very high and we need to work very flexibly with short lead times,” ASSB’s Managing Director explains.

Precision work: ASSB employees pay attention to every detail

This can cause the colleagues in Malaysia to temporarily break out in a sweat. However, the high humidity no longer worries van Beers. There’s only one thing he can’t get used to: “I miss licorice and one or two kinds of Dutch cheese. They’ll definitely be on my shopping list on my next trip to Europe.”

Close examination: visual inspection of engine blades

ASSB repairs engine blades supplied by MTU and LHT as well as third parties

I. Accounting policies and principles

Fundamentals and methods

MTU Aero Engines AG, Munich, together with its consolidated entities (hereinafter referred to as MTU or the MTU group) ranks among the world's largest manufacturers of engine modules and components, and is one of the leading providers of MRO services for commercial aero engines in the world.

The business activities of the MTU group range through the entire lifecycle of an engine program, i.e. from development, construction, testing and production of new commercial and military engines and spare parts, through to maintenance, repair and overhaul of commercial and military engines. MTU divides its activities into two operating segments: the OEM segment (commercial and military engine business) and the MRO segment (commercial maintenance business).

MTU's commercial and military engine business covers the development and production of modules, components and spare parts for engine programs, including final assembly. MTU's military engine business additionally includes maintenance services for these engines. The commercial maintenance business covers activities in the areas of maintenance and related services.

The parent company, MTU Aero Engines AG, registered office Dachauer Str. 665, 80995 Munich, Germany, is registered under HRB 157 206 in the commercial registry at the district court of Munich.

The consolidated financial statements were approved for publication by the Executive Board of MTU Aero Engines AG, Munich, on February 19, 2018.

MTU's consolidated financial statements have been drawn up in accordance with International Financial Reporting Standards (IFRSs), such as they apply in the European Union (EU), and the supplementary requirements of Section 315e (1) of the German Commercial Code (HGB). All IFRSs issued by the International Accounting Standards Board (IASB) that were effective and have been endorsed by the European Commission for use in the EU at the time these consolidated financial statements were drawn up have been applied.

The consolidated financial statements as at December 31, 2017 and the combined management report for the financial year 2017 have been compiled in accordance with Section 315e (1) of the German Commercial Code (HGB) and published in the Federal Gazette (Bundesanzeiger).

The financial year is identical with the calendar year. Comparative data for the previous year are disclosed in the consolidated financial statements.

In the presentation of the balance sheet, a distinction is made between non-current and current assets and liabilities. A more detailed presentation of certain of these items in terms of their timing is provided in the Notes to the consolidated financial statements. An asset or liability is classified as current if:

- it is held primarily for trading purposes,
- it is expected to be realized or repaid respectively within twelve months of the reporting date,
- it is cash or a cash equivalent, unless the exchange or utilization of the asset for the purpose of fulfilling an obligation is restricted for a period of at least twelve months after the reporting date, or
- it is a construction contract or service business receivable or payable that will be realized during MTU's normal business cycle, even if the period for realization exceeds twelve months.

The income statement is laid out in accordance with the cost-of-sales accounting format, in which revenues are balanced against the expenses incurred in order to generate these revenues, and the expenses are recorded in the appropriate line items by function: manufacturing, research and development, selling and general administration. The consolidated financial statements have been compiled in euros. All amounts are stated in millions of euros (€ million), unless otherwise specified.

The financial statements prepared by MTU Aero Engines AG, Munich, and its subsidiaries are included in the consolidated financial statements consideing uniform methods of recognition and measurement.

Accounting standards and interpretations, and revised/amended accounting standards and interpretations, applied for the first time in the financial year 2017

The following accounting standards and interpretations, and revised / amended accounting standards and interpretations, were applied for the first time in MTU's financial statements:

New amendments and standards

Standard	Title
IAS 7	Amendments to Disclosure Initiative
IAS 12	Amendments to Recognition of Deferred Taxes for Unrealized Losses
Annual improvements to IFRSs 2014 - 2016	IAS 12 Disclosure of Interests in Other Entities

Their application did not result in any significant changes to MTU's financial reporting.

Accounting standards and interpretations, and revised/amended accounting standards and interpretations, issued but not yet applied

The following accounting standards and interpretations, and revised / amended accounting standards and interpretations, have been issued by the IASB but were not yet effective for annual periods beginning on or after January 1, 2017:

New and amended standards and interpretations

Standard	Title
IFRS 2	Amendments to Classification and Measurement of Share-Based Payment Transactions [1) 3)]
IFRS 4	Amendments to Applying IFRS 9 Financial Instruments with IFRS 4 Insurance Contracts [1)]
IFRS 9	Financial Instruments [1)]
IFRS 15	Revenue from Contracts with Customers [1)]
IFRS 16	Leases [2)]
IAS 40	Amendments to Transfers of Investment Property [1) 3)]
IFRIC 22	Foreign Currency Transactions and Advance Consideration [1) 3)]
IFRIC 23	Uncertainty over Income Tax Treatments [2) 3)]
Annual improvements to IFRSs 2014 – 2016	IFRS 1 First-time Adoption of International Financial Reporting Standards [1) 3)] IAS 28 Investments in Associates and Joint Ventures [1) 3)]
Annual improvements to IFRSs 2015 – 2017	IFRS 3 Business Combinations and IFRS 11 Joint Arrangements [2) 3)] IAS 12 Income Taxes [2) 3)] IAS 23 Borrowing Costs [2) 3)]

[1)] Effective for annual periods beginning on or after January 1, 2018.
[2)] Effective for annual periods beginning on or after January 1, 2019.
[3)] Still awaiting EU endorsement.

MTU does not intend voluntarily to apply any of these standards and interpretations, or any amendments made to them, in advance of their effective date.

In the interests of efficient reporting practice, the following descriptions of standards and interpretations are limited to those that, on the basis of the MTU group's business model, could potentially have a material impact on the financial reporting in future reporting periods.

IFRS 9, Financial Instruments

IFRS 9, Financial Instruments, issued in July 2014 introduces simpler, principles-based rules for the accounting treatment of financial instruments by adding a new classification and measurement model oriented toward the structure of contractual cash flows and the nature of the business model.

At the same time, a new impairment model is utilized that constitutes a shift away from the incurred loss model in IAS 39. The new expected credit loss model now requires expected losses to be accounted for at inception of a contract, except in the case of financial assets that were already impaired at the time of acquisition.

IFRS 9 also provides new guidance on hedge accounting and aims to more closely dovetail an entity's risk management activities with hedge accounting in order to provide a clearer picture of the underlying economic reality.

MTU expects no significant impact on the net assets, financial situation or operating results from initial application of IFRS 9.

Accordingly, in line with the transitional provisions, MTU is not currently planning to adjust prior period figures and intends to recognize possible transition effects cumulatively under revenue reserves.

IFRS 15, Revenue from Contracts with Customers

IFRS 15, Revenue from Contracts with Customers, was issued in May 2014 and provides a five-step model framework for accounting for revenue from contracts with customers. The new standard for the recognition of revenue will replace all currently applicable standards and interpretations for revenue recognition from contracts with customers under IFRSs. Application of the standard is mandatory for annual reporting periods starting from January 1, 2018 onwards. When first applying IFRS 15, entities may opt either to apply the standard in full to prior periods (full retrospective approach) or to retain prior period figures as reported under the previous standards (modified retrospective approach). In mid-April 2016, the International Accounting Standards Board (IASB) published additional amendments to IFRS 15, which are intended to resolve a number of implementation issues. The amendments are effective for annual reporting periods beginning on or after January 1, 2018 (same effective date as IFRS 15 itself).

IFRS 15 introduces an extensive framework for the measurement and recognition of revenue from contracts with customers. The core principle of IFRS 15 is that an entity will recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods and services (the transaction price as defined by IFRS 15). Revenue is recognized when control of the goods or services is passed to the customer. IFRS 15 does not impact the presentation of cash flows.

For MTU as an engine manufacturer, the following significant changes result from applying IFRS 15:

- The criteria for recognizing revenue over time by measuring the progress towards complete satisfaction of the performance obligation differ fundamentally from the criteria applied up to now, and focus on the right to payment for performance completed to date in the event that the customer terminates the contract. This may also result in changes to the way in which progress toward complete satisfaction of a performance obligation is measured.
- Payments to customers is usually accounted for as a reduction of revenue provided that such payments are in exchange for a distinct good or service that clearly is not linked to the payments made by the customer for performances carried out.
- IFRS 15 provides explicit presentation and disclosure requirements, which are more detailed than under present IFRSs. Entities will therefore be required to provide a significantly higher number of quantitative and qualitative disclosures in their consolidated financial statements. For example, IFRS 15 requires preparers to disclose opening and closing balances of net contract assets and liabilities as well as the aggregate amount of the transaction price allocated to the performance obligations that are unsatisfied as of the end of the reporting period.

In 2017, MTU continued the process of evaluating the qualitative impact of applying revenue recognition requirements under IFRS 15 based on an analysis of customer contracts. The quantitative impact was assessed using calculations based on the provisional consolidated financial statements as at December 31, 2017, the results of which are considered below. On this basis and given the ongoing discussions among preparers in the aerospace industry, MTU at the present time identifies the following impacts that application of IFRS 15 is likely to have on financial group reporting:

Commercial engine business

Expenses for marketing engines, especially in the form of indirect payments to airlines and leasing companies and, where they concern the pro rata reimbursement of costs related to the engine program, to the consortium leader (OEM), have

previously been recognized under cost of sales. Under IFRS 15, such payments to the consortium leader (OEM) would qualify as a payment to the customer, and consequently in the future would have to be recognized as a reduction of revenue. This change would result in a decrease of around € 1.33 billion in the amount of group revenues reported in 2017; however, it would not affect absolute earnings realized, as there would also be a corresponding reduction in the cost of sales.

Payments to the consortium leader (OEM) in respect of the acquisition of program assets and the pro rata assumption of costs, in particular for program development efforts, are currently capitalized as intangible assets and amortized on a straight-line basis over their expected useful lives (lifetime of the program). At December 31, 2017, the carrying amount of the intangible assets at issue was € 1.26 billion. The underlying payments also qualify under IFRS 15 as payments to the customer. This would require them in the future to be capitalized and recognized in the balance sheet under other non-current assets and the effect on earnings arising from their amortization (in 2017 approximately € 47 million) to be reflected as a reduction of revenue rather than under cost of sales.

With respect to program-related development activities, IFRS 15 implies an adjustment to the recognition of costs by function for MTU. IFRS 15 would, in particular, require expenses for development efforts so far recognized under research and development expenses to be allocated with around € 30 million to cost of sales. At the same time, the assumption of costs toward the consortium leader (OEM) would be reflected as a reduction of revenue in the amount of € 10 million.

MTU expects application of IFRS 15 to result in a change in the time when revenues are recognized and for engine programs in which engine modules and components are supplied to the consortium leader (OEM) for marketing (in particular consignment warehouse stocks), is currently planning to bring revenue recognition forward to the time of delivery to the OEM. Previously, revenues have been recognized when the OEM has utilized the deliveries (in particular withdrawal from the consignment warehouse). Taking reversal effects from the 2016 reporting year into account, this adjustment would lead to a reduction of revenues amounting to around € 30 million in the 2017 reporting period.

Military engine business

Revenue from development and production activities within the scope of specific military engine programs is currently recognized over time using the percentage-of-completion method. Application of the relevant provisions of IFRS 15 requires revenues generated through these activities to be recognized at a point in time because the criteria for revenue recognition over time under IFRS 15 are not met. Consequently, MTU expects this to result in a delay in revenue realization compared with the status quo. For the reporting year, MTU estimates that – taking reversal effects from the 2016 reporting year into account – this adjustment will lead to an increase in revenues of € 40 million.

Commercial maintenance business (MRO)

In the commercial maintenance business, the group overhauls and repairs aircraft engines and industrial gas turbines and provides related services. Revenue from engine maintenance contracts is currently recognized over time in consideration of the customer-specific service character, maintenance or repair (shop visit) over the full duration of the contract. Based on the analyses performed, under IFRS 15 MTU will be required in the future to recognize revenue for specific contracts considering the full term of the contract and not of the individual shop visit.

MTU group

In the overall analysis, the retrospective application of IFRS 15 to the reported data for 2017 would imply a significant reduction in revenues, with correspondingly lower amounts allocated to cost of sales and research and development expenses. However, the amendments to IFRS 15 had a more moderate impact on absolute earnings realized during the reporting period. In absolute terms, the effect of the amendments to IFRS 15 with regard to the time of recognition of revenues generated in the commercial and military engine business (OEM) would be to reduce group earnings in 2017 by around € 35 million. A significant factor here is the U.S. dollar exchange rate to the euro, which developed from 1.05 to 1.20 in the course of the reporting period. As a consequence, even though the amendments to IFRS 15 result in significantly lower revenues when applied to the reported data for 2017, absolute earnings are reduced only slightly, and the adjusted EBIT margin is increased by around 4 %.

Initial application

MTU has elected to use the full retrospective approach when applying IFRS 15 for the first time. Under this approach, all transition effects at the beginning of the respective comparative period will be recognized directly in equity as an adjustment to retained earnings brought forward. Thus, in the 2018 consolidated financial statements, both the reporting period and the comparative period will be presented applying IFRS 15, which improves comparability of the consolidated income statement in particular. It is currently assumed that it will also be necessary to prepare a third balance sheet as at January 1, 2017. Upon initial application, MTU intends to make use of the disclosure exemptions under IFRS 15 relating to modification and settled contracts.

IFRS 16, Leases

IFRS 16 redefines how to recognize, measure, present and disclose lease arrangements. IFRS 16 replaces the standards and interpretations IAS 17, SIC 15, SIC 27 and IFRIC 4.

The main change in the disclosing of leases is that from a lessee's perspective, the differentiation between finance leases and operating leases is done away with. This means that assets must be recognized in the balance sheet for all rights and licenses in respect of these leases, insofar as they exceed the immateriality thresholds set by the legislator. MTU is currently evaluating the impacts of IFRS 16 on its future financial reporting.

Initial application

No decision has yet been taken in respect of whether MTU will adopt IFRS 15 using a full retrospective approach or a modified retrospective approach.

Application of Section 264 (3) of the German Commercial Code (HGB)

MTU Maintenance Hannover GmbH, Langenhagen, and MTU Maintenance Berlin-Brandenburg GmbH, Ludwigsfelde, which are consolidated affiliated companies of MTU Aero Engines AG, Munich, have invoked the exemption provisions of Section 264 (3) of the German Commercial Code (HGB).

Group reporting entity

At December 31, 2017, the MTU group including MTU Aero Engines AG, Munich, comprised 33 companies. These are presented in detail in the list of major shareholdings in Note 38 (Relationships with related companies and persons).

Please see below for information on changes in the composition of the consolidated group. The assets of MTU München Unterstützungskasse GmbH i.L. (in liquidation), Munich, are classified as plan assets as defined in IAS 19. For this reason, MTU München Unterstützungskasse GmbH i.L. (in liquidation), Munich, is not consolidated.

Change in composition of the consolidated group

The number of group companies and equity investments in associated companies and joint ventures included in the consolidated financial statements developed as follows:

Group reporting entity

	Germany	International	Total
Shareholdings at Dec. 31, 2015	**11**	**20**	**31**
Additions 2016		1	1
Disposals 2016		–1	–1
Shareholdings at Dec. 31, 2016	**11**	**20**	**31**
Additions 2017		2	2
Disposals 2017			
Shareholdings at Dec. 31, 2017	**11**	**22**	**33**

On January 3, 2017, MS Engine Leasing LLC., Rocky Hill, USA was founded. The purpose of this company is the financing of leasing business relating to the PW1100G-JM engine program. In the second half-year, the financing partner Sumitomo Corporation of Americas, New York, USA, acquired 44.5 % of the shares as per December 31, 2017 by means of several capital injections. The company has been fully consolidated.

Lufthansa Technik AG, Hamburg, and MTU Aero Engines AG, Munich, have founded a 50:50 joint venture for the maintenance of Geared Turbofan™ engines. The joint venture will operate under the name of EME Aero sp. z.o.o.. The joint venture contract was signed by both partners on December 4, 2017, after a framework agreement had been concluded in February 2017.

EME Aero sp. z.o.o. is headquartered in Poland and is expected to provide work for up to 800 people. The two partners intend to invest a total of around € 150 million in the new joint venture between now and 2020. The joint venture has a planned capacity of more than 400 shop visits per year of the PW1000G family of Geared Turbofan™ engines, which power the Airbus A320neo family, for example. The company is accounted for using the equity method.

Subsidiaries

The consolidated financial statements of MTU Aero Engines AG, Munich, include all significant companies in which MTU Aero Engines AG, Munich, has a controlling interest as defined by IFRS 10, in other words entities in which MTU, as the investor, is exposed to, or has rights to, variable returns from its involvement with the investee and has the ability to affect those returns through its control over the investee. There were no changes in the classification of these controlling interests during the reporting period.

Associated companies

Associated companies are companies in which MTU has significant influence on the investee in accordance with IAS 28 and which are neither subsidiaries nor joint ventures. The equity investments in entities corresponding to this definition, over whose financial and operating policies MTU directly or indirectly exercises significant influence, are accounted for using the equity method, or at cost if the effects of their consolidation at equity would have no significant impact on the presentation of MTU's net assets, financial situation or operating results.

There were no changes in the classification of the equity investments during the reporting period. Whereas MTU held an 18 % share in the voting rights of IAE International Aero Engines LLC., East Hartford, USA, as well as PW1100G-JM Engine Leasing LLC., East Hartford, USA, the underlying agreements grant MTU significant influence over the investees, as well as information and consultation rights, thus justifying their classification as associated companies.

Joint ventures

Joint ventures are companies over which MTU exercises joint control together with one or more other entities in accordance with IFRS 11.

MTU's principal joint ventures, namely

- MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China,
- Pratt & Whitney Canada Customer Service Centre Europe GmbH, Ludwigsfelde, Germany,
- Ceramic Coating Center S.A.S., Paris, France,
- Airfoil Services Sdn.Bhd., Kota Damansara, Malaysia,
- AES Aerospace Embedded Solutions GmbH, Munich, Germany
- Engine Maintenance Europe Aero sp. z.o.o., Jasionka, Poland

are accounted for in the consolidated financial statements using the equity method.

Non-significant investments

Non-significant investments are shares in companies and stakes in engine programs whose overall impact on the group's net assets, financial situation and operating results is currently and foreseeably not material. These equity investments are accounted for at cost in the consolidated financial statements.

Restrictions

In individual cases, MTU or its subsidiaries may be subject to restrictions on their ability to transfer liquid funds or other assets to other group companies. Such restrictions may stem from regulatory requirements or from contractual agreements between the investors in the individual companies.

Consolidation principles

All business combinations are accounted for using the acquisition method in accordance with IFRS 3. Under the acquisition method, the acquirer accounts for the business combination by measuring and recognizing the identifiable assets acquired and the liabilities and contingent liabilities assumed. The identifiable assets, liabilities, and contingent liabilities are measured at fair value. In accordance with IAS 36, goodwill is tested for impairment at least annually, or at shorter intervals if there is an indication that the asset might be impaired. If the group's interest in the net fair value of the acquired identifiable net assets exceeds the cost of the business combination, that excess (negative goodwill) is recognized in the income statement – after remeasurement as required by IFRS 3.36.

The effects of intragroup transactions are eliminated. When accounting for dealings between entities of the consolidated group, accounts receivable are offset against accounts payable and expenses are offset against income. Internal sales are transacted on the basis of normal market transfer prices and intragroup profits and losses are eliminated.

In accordance with IAS 12, deferred tax assets and liabilities are recognized on temporary differences arising from the elimination of intragroup profits and losses.

Currency translation

Transactions in foreign currencies are translated to the functional currency using the exchange rate prevailing on the date of the transaction. At the reporting date, monetary items are translated using the exchange rate prevailing at that date, whereas non-monetary items are translated using the exchange rate prevailing on the transaction date. Translation differences are recognized in the income statement. The assets and liabilities of group companies whose functional currency is not the euro are translated from the corresponding local currency to the euro using the closing exchange rate at the reporting date. In the income statements of foreign group companies whose functional currency is not the euro, income and expense items are translated each month using the exchange rate applicable at the end of the month; the average exchange rate for the year can be derived from these end-of-month exchange rates. The translation differences arising in this way are recognized in other comprehensive income and do not have any impact on the net profit / loss for the year.

Accounting policy and measurement methods

The consolidated financial statements of MTU Aero Engines AG, Munich, and its subsidiaries are drawn up using uniform accounting policies based on the International Financial Reporting Standards (IFRSs).

Revenues

Revenues from the sale of goods are recognized in accordance with IAS 18. This means that certain criteria must be met, in particular that the significant risks and rewards of ownership of the goods have been transferred to the purchaser and that MTU retains neither continuing managerial involvement nor effective control over the goods sold. The company's customers are risk- and revenue-sharing partners in engine programs, cooperation entities, public-sector contractors, airlines and other third parties.

Revenues arising from the rendering of services, provided that the criteria specified in IAS 18 are met, are recognized by reference to the stage of completion of the transaction and measured relative to costs incurred or, if the criteria are not met, to the extent of the expenses recognized that are recoverable.

Revenues from construction contracts are recorded on the basis of the percentage of completion in accordance with IAS 11. An explanation of the measurement of percentage of completion is provided under the heading "construction contract and service business receivables". Revenues are always reported net of trade discounts, customer loyalty awards, and other directly attributable rebates.

The group's forward foreign currency contracts satisfy the conditions for applying hedge accounting in accordance with IAS 39. The instruments used to hedge cash flows are measured at their fair value, with gains and losses recognized initially under other comprehensive income. They are subsequently recorded as revenues when the hedged item is recognized.

Cost of sales

The cost of sales comprises the manufacturing cost of goods and services sold, including purchased development assets, and the cost of products purchased for resale. In addition to direct material and production costs, it also comprises allocated manufacturing-related overheads, including amortization / depreciation of the production-related intangible assets and production installations, write-downs on inventories and an appropriate portion of production-related administrative overheads. The cost of sales also includes expenses charged by OEMs for marketing engines in conjunction with risk- and revenue-sharing partnerships.

Research and development expenses

Research costs are charged to expense in the period in which they are incurred.

In the case of development costs, a distinction is drawn between externally funded development activities and company-funded development activities. Services provided as part of externally funded development projects are allocated to cost of sales, in light of the fact that compensation for such services is paid by a contracting entity.

Development costs generated in the context of company-funded R&D projects are capitalized in accordance with IAS 38 or recognized as an expense in the period in which they are incurred. The capitalized development costs comprise all costs directly attributable to the development process and are amortized over the product's respective useful life from the date at which it becomes usable.

Intangible assets

Externally acquired and internally generated intangible assets are recognized in accordance with IAS 38 if it is probable that a future economic benefit associated with the asset will flow to the entity and the cost of the asset can be measured reliably.

When intangible assets are acquired that include significant deferred, conditional purchase price components, they are accounted for by analogy with IFRIC 1. Changes resulting from the subsequent measurement of the conditional purchase price components are accounted for as subsequent costs of acquisition or allowance.

Intangible assets with a finite useful life are carried at their acquisition or construction cost and amortized on a straight-line basis over their useful lives.

Amortization is based on the following generally accepted useful lives:

Useful lives of assets (in years)	
Program assets and capitalized development costs	maximum 30
Program-independent technologies	10
Customer relations	4 - 26
Other intangible assets	3 - 5

The useful lives and amortization methods pertaining to intangible assets are regularly assessed for relevance and adjustments are made where necessary to the estimates used when compiling the financial statements. Goodwill is tested for impairment on a yearly basis in accordance with IAS 36. Each of the two operating segments, OEM (commercial and military engine business) and MRO (commercial maintenance business), are tested separately.

Public sector grants and assistance

Public sector grants and assistance are recognized in accordance with IAS 20 only if there is reasonable assurance that the conditions attached to them will be complied with and that the grants will be received. Grants are recognized as income over the periods necessary to match them with the related costs that they are intended to compensate. In the case of capital expenditure on property, plant and equipment and on intangible assets, the amount of the public sector grant awarded for this purpose is deducted from the acquisition or construction costs of the asset. The grants are then recognized in the income statement using reduced depreciation / amortization amounts over the lifetime of the asset.

Property, plant and equipment

Property, plant and equipment are subject to wear and tear and are carried at their acquisition or construction cost less cumulative depreciation charges and impairment losses. The cost of items of self-constructed plant and equipment comprises all directly attributable costs and an appropriate proportion of production-related overheads. The assets are assigned to an appropriate category once they have been completed or are operational. The revaluation model is not applied. Depreciation on property, plant and equipment is calculated using the linear method in accordance with the useful life of the asset.

Depreciation is based on the following general useful lives:

Useful lives of assets (in years)	
Building	25 - 50
Lightweight structures	10
Property facilities	10 - 20
Technical equipment, plant and machinery	5 - 10
Operational and office equipment	3 - 15

The useful lives of machines used in multi-shift operation are reduced accordingly to take account of additional usage.

Borrowing costs

Borrowing costs directly related to the acquisition, construction or production of qualifying assets are added to the acquisition or construction costs of those assets until such time as the assets have been made ready for sale or for their intended use. Qualifying assets are those that require a substantial period of time to be made ready for sale or for their intended use in accordance with IAS 23.

Borrowing costs are capitalized only insofar as they relate to the purchase and preparation of qualifying assets for their intended use or sale, and only include activities that commenced on or after January 1, 2009.

Leasing

Leasing contracts are classified in accordance with IAS 17 as either operating leases or finance leases, depending on whether the lessor or lessee is attributed the beneficial ownership of the leased asset and bears the substantial risks and rewards associated with ownership of the leased asset. If the lessor retains the substantial risks and rewards (operating lease), the leased asset is recognized in the lessor's balance sheet. The lessee in an operating lease arrangement recognizes lease payments to be made as an expense throughout the duration of the lease arrangement.

If the substantial risks and rewards associated with ownership of the leased asset are transferred to the lessee (finance lease), the leased asset is recognized in the lessee's balance sheet. The leased object is recognized at its fair value as measured at the date of acquisition, or at the present value of future minimum lease payments if lower, and depreciated over its estimated useful life, or the contract duration if shorter. The lessee immediately recognizes a finance lease liability corresponding to the carrying amount of the leased asset. The effective interest rate method is employed to update the lease liability in subsequent periods.

Impairment losses on intangible assets and property, plant and equipment

At each reporting date, an analysis is carried out to reveal any indication that the value of intangible assets or assets of property, plant and equipment might be impaired. If impairment is indicated, the value of the asset in question is assessed on the basis of its recoverable amount.

Assets with an indefinite useful life, intangible assets that are not yet ready for use, and goodwill acquired in connection with a business combination are not subject to amortization, but are instead reviewed for impairment at least once each year.

The impairment loss on intangible assets and property, plant and equipment is determined by comparing the carrying amount with the recoverable amount. The recoverable amount is either the fair value of the asset (or of the cash-generating unit) less costs to sell, or the value in use, whichever is higher. The recoverable amount is usually determined using a discounted cash flow (DCF) method. If it is not possible to attribute separate future cash flows to discrete assets that have been generated independently of other assets, then an impairment test must be carried out on the basis of the cash-generating unit to which the asset (group) ultimately belongs. That involves making forecasts of the cash flow that can be generated by the asset or cash-generating unit, and applying a discount rate that takes into account the risks associated with the asset or cash-generating unit.

If the reasons for impairment losses recognized in a prior period no longer exist, the impairment loss on these assets is reversed, except in the case of goodwill.

Non-current financial assets

Investments in joint ventures and associated companies that have a significant impact on the group's net assets, financial situation or operating results are accounted for at equity. The group's share in the profit or loss of these entities is therefore allocated on a pro rata basis to profit / loss and to the corresponding carrying amount of the investment. This profit / loss is reported as a separate line item under "profit / loss of companies accounted for using the equity method."

Investments in subsidiaries that are neither consolidated nor proportionately consolidated, and other equity investments and long-term loans, are carried at cost – with appropriate adjustments for impairment losses where necessary. Income from dividends paid by these equity investments is included in the profit / loss of companies accounted for at cost.

Inventories

Raw materials and supplies are measured at average acquisition cost or net realizable value, whichever is lower. Trade discounts and customer loyalty awards are taken into account when determining acquisition costs. Acquisition cost comprises all direct costs of purchasing and other costs incurred in bringing the inventories to their present location and condition. Net realizable value is the estimated selling price generated in the ordinary course of business for the finished product in question, less estimated costs necessary to make the sale (costs to complete and selling costs).

Finished products and work in progress are recognized at manufacturing cost or net realizable value, whichever is lower. Manufacturing cost comprises all production-related expenses based on normal capacity utilization. In addition to direct costs, these include an appropriate and necessary portion of the cost of material and production overheads, including production-related depreciation. Administrative expenses are also included to the extent that they can be attributed to production operations.

Construction contract receivables and service business receivables

All receivables arising from construction contracts are recognized in accordance with IAS 11 using the percentage-of-completion (PoC) method. If the outcome of a specific construction contract can be estimated reliably, revenues and income are recognized in proportion to the percentage of completion. The percentage of completion is determined as the ratio of contract costs incurred up to the reporting date to total contract costs or on the basis of a verifiable amount of completed work (measured by means of milestones). If the outcome of a contract cannot be estimated reliably, the zero-profit method is applied, whereby revenues are recognized only to the extent that contract costs have been incurred and are deemed to be recoverable. If services / production under a construction contract have not been invoiced, the respective contract revenue, as far as deemed recoverable, and corresponding contract costs are recognized through P&L. The recognized amount of constructions contract receivables there-fore represents the sum of contract costs incurred up to the reporting date plus a proportional amount of contract earnings less losses incurred and partial settlements.

Any advance payments received by the group for construction contracts are deducted from the corresponding construction contract receivables. If the advance payments received in respect of a contract are higher than the construction contract receivables, the difference is recognized under construction contract payables. Construction contract receivables and construction contract payables deriving from different customers' contracts are not offset against one another.

These principles apply by analogy to service business receivables and payables.

Financial instruments

A financial instrument is a contract that simultaneously gives rise to a financial asset in one company and to a financial liability or equity instrument in another company. At MTU, financial instruments are measured at the settlement amount.

Financial assets

Financial assets include, in particular, cash and cash equivalents, trade receivables, loans, other receivables, financial investments held to maturity, and non-derivative and derivative financial assets held for trading.

Financial assets are measured in accordance with their classification as per IAS 39. The measurement of a financial asset subsequent to initial recognition depends on whether the financial instrument is "held for trading," "held to maturity," "available for sale," or whether it falls into the "loans and receivables" category. The assignment of an asset to a measurement category is performed at the time of acquisition and is primarily determined by the purpose for which the financial asset is acquired. No financial assets were reclassified in the financial year 2017.

At initial recognition, financial assets are measured at their fair value. In the case of financial assets that are not subsequently measured at fair value through profit or loss, the transaction costs directly attributable to the acquisition of the financial asset are included in the initial measurement.

Financial instruments held for trading are measured at fair value through profit or loss. This category primarily includes derivative financial instruments that do not form part of an effective hedging relationship as defined in IAS 39. Any gain or loss resulting from remeasurement is recognized in the income statement.

Financial assets acquired when making financial investments and that are intended and expected, with reasonable certainty, to be held to maturity are measured at amortized cost using the effective interest method.

Financial assets classified as loans and receivables are measured at amortized cost less impairment, using the effective interest method where appropriate.

Other non-derivative financial assets are classified as available for sale. These are always measured at fair value. In MTU's financial statements, this item includes the carrying amount of subsidiaries, joint ventures and other equity invest-

ments, which are measured at the cost of acquisition because they are not quoted in an active market, and are not the subject of any planned disinvestment. Resulting gains or losses are recognized directly in equity. If it is not possible to reliably measure the fair value of an equity instrument that is not quoted in an active market, the investment is measured at cost (less impairment).

Impairment loss on financial assets

At each reporting date, the carrying amounts of financial assets that are not measured at fair value through profit or loss are assessed for any indication of impairment.

Examples of such indications include significant financial difficulties of the debtor or a high probability that the debtor will enter bankruptcy or financial reorganization, the closure of an active market, significant changes in technological, economic, legal or market conditions affecting the issuer, or a significant or persistent decline in the fair value of the financial asset below its amortized cost, including any previously recognized impairment losses. Impairment losses are initially entered in a separate valuation allowance account and only recognized as such after it has been established that the value of the asset is unrecoverable. The amount of the impairment loss is recognized in the income statement. If impairment is indicated for "available-for-sale" financial assets, the amounts previously recognized in other comprehensive income are eliminated from equity up to the amount of the assessed impairment loss and recycled to the income statement.

If, in a subsequent period, there is objective evidence that the fair value has increased due to an event occurring after the impairment was originally recognized, the impairment loss is reversed through profit or loss. Impairment losses affecting "available-for-sale" equity instruments and equity instruments not quoted in an active market are not reversed through profit or loss until they are effectively recovered.

The fair value of securities classified as "held-to-maturity" financial instruments and the fair value of loans and receivables correspond to the present value of the resulting future estimated cash flows discounted at the financial asset's original effective interest rate. The fair value of equity instruments not quoted in an active market is calculated on the basis of the future estimated cash flows discounted at the current rate consistent with the specific risks to which the investment is exposed.

Financial liabilities

Financial liabilities often oblige the holder to return the instrument to the issuer in return for cash or another financial asset. Financial liabilities include, in particular, bonds and other debts evidenced by certificates, trade payables, liabilities to banks, finance lease liabilities, borrowers' note loans and derivative financial liabilities.

Financial liabilities are measured at their fair value at the time of acquisition, which is normally equivalent to the fair value of the settlement amount. Transaction costs directly attributable to the acquisition are deducted from the amount of all financial liabilities. If a financial liability is interest-free or bears interest at below the market rate, it is recognized at an amount that is consistently lower than the settlement price or nominal value. The financial liability initially recognized at fair value is amortized subsequent to initial recognition using the effective interest method.

Cash and cash equivalents

The salient features of cash and cash equivalents, which include demand deposits and short-term bank deposits, are that they have a maturity of three months or less from the date of acquisition, and are measured at their nominal value.

Derivative financial instruments

MTU uses derivative financial instruments as a hedge against currency and price risks arising out of its operating activities and financing transactions.

At initial recognition and when measured subsequently, derivative financial instruments are measured at their fair value. This value is determined using quoted market prices in an active market and is represented by the amount that MTU would receive or would have to pay at the reporting date when the financial instrument is terminated. If no quoted market prices in an active market are available, the fair value is calculated using recognized financial mathematical models (DCF method) on the basis of the relevant exchange rates, interest rates and credit standing of the contractual partners at the reporting date.

Hedge accounting (hedging relationships)

MTU satisfies the requirements of IAS 39 concerning instruments used to hedge future cash flows. When a hedge is undertaken, the relationship between the financial instrument designated as the hedging instrument and the underlying transaction is documented, as are the risk management objective and strategy for undertaking the hedge. This includes assessing the effectiveness of the hedging instrument used. Existing cash flow hedges are checked for effectiveness on a regular basis.

MTU uses cash flow hedges to hedge the exposure of future payment cash flows transacted in U.S. dollars (underlying transactions) to fluctuations in foreign currency exchange rates. At remeasurement subsequent to initial recognition, the effective portion of the hedging instrument is recognized in equity under other comprehensive income, together with attributable deferred taxes, until such time as the underlying hedged transaction is realized. The ineffective portion of the change in value of the hedging instrument is recognized on each reporting date in the financial result.

The amounts recognized in other comprehensive income at remeasurement are recycled to the income statement as soon as the underlying hedged transaction is recognized.

Current and deferred taxes

Current and deferred taxes are recognized in the consolidated financial statements in the manner prescribed in the relevant tax jurisdictions. Current and deferred taxes are recognized in equity if they relate to business transactions that directly lead to a decrease or increase in equity. Interest in connection with tax payments and refunds for prior periods resulting from tax audits is recognized in the income statement under income taxes.

Deferred tax assets and liabilities are established for temporary differences between the tax bases of assets and liabilities and their carrying amount in the consolidated balance sheet (“balance sheet liability method”). Tax assets are established on tax credits available for carry-forward at such time as the conditions attached to the award of the tax credit have been fulfilled. Similarly, deferred tax assets are established on tax losses available for carry-forward. Deferred tax assets are recognized to the extent of the probability that taxable income will be available against which the deductible temporary difference can be applied together with losses as well as tax credits that are permitted to be carried forward. Deferred tax assets and liabilities are measured using the tax rates applicable on the date when the temporary differences are reversed. Deferred tax assets and liabilities are offset insofar as this meets the requirements of IAS 12.74.

Pension obligations

Provisions for pension obligations are accounted for using the projected unit credit method in accordance with IAS 19. This method takes account not only of pension and other vested benefits known at the reporting date, but also of expected increases in pensions and salaries, applying a conservative assessment of the relevant parameters.

Actuarial gains and losses – from the measurement of the defined benefit obligation (DBO) and the plan assets – may arise either from changes in the actuarial assumptions used or when the actual development diverges from those assumptions. They are recognized in other comprehensive income in the period in which they arise, and are recognized separately in the statement of comprehensive income. Past service cost is recognized directly in profit and loss. Where reinsurance claims exist and the criteria given in IAS 19 are met, these claims are treated as plan assets and netted against the pension obligations. The interest expense resulting from the reversal of the discount on the net liability, comprising pension obligations less the corresponding plan assets, is recognized under the financial result on other items. Service cost is recognized in the income statement as personnel expenses allocated to the relevant costs by function.

Other provisions

In accordance with IAS 37, other provisions are recognized to cover legal or de facto obligations resulting from past events if settlement is expected to result in an outflow of resources. Such obligations regularly arise in connection with claims on warranties and the risk of pending losses on onerous contracts, the recognition of losses arising from the settlement of accounts and subsequent costs, personnel costs, various taxes (especially consumer taxes), and other costs such as the risk of legal action and lawsuits, for instance in connection with government investigations. Non-current provisions for liabilities with an identifiable due date more than one year beyond the reporting date are measured at the present value of

expected future cash flows. The company measures provisions for pending losses on onerous contracts at the lower of the expected costs on settlement of the contract and the expected costs on premature termination of the contract.

Provisions for personnel obligations are recognized in accordance with IAS 19 or IAS 37. Obligations relating to pre-retirement part-time working arrangements and long-service awards are measured on the basis of actuarial reports.

Contingent liabilities

Contingent liabilities are potential obligations arising from past events whose existence depends on the occurrence or non-occurrence of one or more uncertain future events that are not wholly within the control of MTU. Contingent liabilities are not recognized as liabilities in the balance sheet because at the reporting date it is considered that there is unlikely to be an outflow of economic resources, or that the amount of the obligation cannot be reliably estimated.

Dividend payment and profit distribution

The claims of shareholders to dividend payments and profit distribution relating to a specific reporting period (financial year) are recognized as a liability in the period in which the corresponding resolution is passed. Disclosures relating to the Executive Board's proposal to the Annual General Meeting concerning the dividend payment are provided in Part VII of these Notes (Determination of the net profit available for distribution on the basis of the German GAAP annual financial statements).

Discretionary scope, measurement uncertainties and sensitivity

Preparation of the consolidated financial statements in accordance with IFRSs requires that assumptions and estimations be made that have an impact not only on the amounts of the assets and liabilities, and contingent liabilities, but also on how these items are recognized. These assumptions and estimations conform with the circumstances prevailing at the reporting date and, to that extent, also influence the amount of income and expenditure recognized in the financial years presented. The assumptions and estimations relate primarily to the determination of the useful lives of assets that apply group-wide, the calculation of the fair value of financial instruments, the determination of the effective date of planned transactions that form part of a hedging relationship, the measurement and recognition of provisions and tax credits, and assumptions in connection with impairment tests and purchase-price allocations.

Actual values may occasionally deviate from the assumed and estimated values. Changes are made when more reliable information becomes available and these may have an impact on the figures of the period in which the changes are effectuated and, where applicable, on subsequent periods.

- Due to the long-term product lifecycle, changes in the applied interest rates and payment flows have a significant impact on the measurement of engine programs.
- The interpretation of a sensitivity analysis of the extent of possible consequences of changes to measurement parameters, in particular those relating to claims on warranties, price and quantity structures, the risk of pending losses on onerous contracts, the risk of losses arising from the settlement of accounts, and the measurement of risks arising from legal action and lawsuits, does not allow the consequences of individual events to be assessed, due to the multitude of sensitivity scenarios presenting high degrees of uncertainty.
- The measurement of property, plant and equipment, intangible assets and financial assets involves the use of estimations. Judgments by management form the basis for determining the fair value of assets and liabilities and the useful life of assets.
- In the process of determining impairment losses, estimations are made concerning such parameters as the source, timing and amount of the impairment loss. Many different factors can give rise to an impairment loss, e. g. changes in the competitive situation, expectations concerning the growth of air travel and the aircraft industry, changes in the cost of capital, changes in the future availability of financing funds, aging and obsolescence of technologies, replacement costs, or purchase prices paid in comparable transactions.
- Estimates are also involved when calculating the recoverable amounts for both operating segments as well as for assets as part of impairment tests. They concern the identification and verification of indicated impairments, expected cash flows, relevant discount rates, corresponding useful lives and residual values. In particular, the estimation of cash flows on which the recoverable amounts are based in the case of new

engine programs depends on the assumption that it will be possible to raise funds on a continuous basis and that it will be necessary to make continuous ongoing investments. If the demand for engines is slower than expected, this could reduce earnings and cash flows and possibly lead to the recognition of impairment losses. These estimations and the method used to obtain them have a significant impact on the recoverable amount determined and on the amount of the impairment loss recognized on goodwill. Reference is made to Note 35. (Sensitivity analysis of goodwill) for a sensitivity analysis of the goodwill of the two operating segments.

- Management creates allowances for doubtful accounts. Receivables are identified as being in need of a valuation allowance on the basis of factors such as the repayment structure of the balance of settlements and by monitoring the customer's credit standing. If the customer's credit standing should deteriorate, the volume of the allowances that then have to be created or receivables to be written off may exceed the previously recognized amount.
- In certain cases, financial liabilities may be linked to deferred, conditional purchase price components, resulting in the need to make predictions about the conditions upon which their subsequent measurement is dependent. A particular case in point in this context is the purchase price obligation arising from the IAE-V2500 stake increase. To account for changes in this liability, MTU makes use of publicly available market data (interest rates, U.S.-dollar exchange rates) and, in particular, an input parameter that is not publicly observable, namely the number of flight hours that a part of the V2500 engine fleet is expected to accumulate, on which the deferred payments up to the year 2027 are based. To predict the future number of flight hours, MTU makes use of an in-house forecasting model that is based on internally available information concerning the in-service V2500 fleet. The sensitivity analysis takes into account both the absolute number of flight hours on which payments are based and the time period within which these hours arise.
- Revenues arising from construction contracts and from the provision of services are recognized s, using the percentage-of-completion method, if it is sufficiently probable that future economic benefits associated with the business will flow to MTU. Because in some cases it may not be possible to reliably estimate the outcome, revenues calculated using the percentage-of-completion method are recognized on the basis of the contract costs incurred up to the reporting date, to the extent that it is probable that these costs can be recovered. The measurement uncertainty is consistent with the complexity and long-term nature of the manufacturing contracts and service agreements. Management regularly reviews all estimations made in connection with these construction and service contracts, making adjustments to the accounts where necessary.
- Revenues and the cost of sales for engine components and spare parts is partially based on estimates for accounting purposes. These estimations are derived principally from preliminary data supplied by the consortium leaders. Moreover, the settlement of insurance claims in connection with construction contracts and customized MRO services may in certain cases require the use of estimations as to the probability that the claimed amount will ultimately be paid.
- Income taxes must be determined for each tax jurisdiction in which the group operates. Estimates are required when measuring actual and deferred taxes. The utilization of deferred tax assets depends on the possibility of generating sufficient taxable income in a particular tax category and tax jurisdiction. A variety of factors are used to assess the probability that it will be possible to utilize deferred tax assets, including past operating results, operating business plans and the periods over which losses can be carried forward. If the actual results deviate from these estimations, or if these estimations have to be adjusted in a future period, this may have an impact on the group's net asset position, financial situation and operating results.
- The total value of provisions for pensions and similar obligations, and therefore the expenses in connection with employees' retirement benefits, are determined using actuarial methods based on assumptions concerning interest rates, choice of optional payment modalities, salary and pension trends, and life expectancy. If it should become necessary to modify these assumptions, this could have a significant effect on the future amount of pension provisions or the future expenses for pensions.

- The measurement and recognition of other provisions, accrued liabilities (as defined in IAS 37) and contingent liabilities involve substantial estimations by MTU. Such estimations concern contractual penalties, the failure of program partners and customers to provide relevant information, the cost of developing suitable engineering solutions, changes in the requirements imposed by flight safety organizations and aviation authorities, and the cost of meeting warranty obligations. Similarly, when accounting for committed aircraft financing agreements, estimations are required concerning the probability that the loans will be realized, the consistency of the terms with market conditions, and the change in value of the pledged securities. Due to the uncertainties attached to this assessment, the actual expenses may deviate from those originally estimated, and from the corresponding balance sheet items and explanatory disclosures in the Notes.

All assumptions and estimates are based on the prevailing conditions and judgments made at the reporting date. Any subsequent changes occurring before the financial statements are published are taken into account. Estimations of future business developments also take into account the economic environment of the industry and the regions in which MTU is active, such as are deemed realistic at that time. In order to obtain new information, MTU also relies on the services of external consultants such as actuaries and legal counsels. Changes to the estimations of these obligations can have a significant impact on future operating results.

Zhuhai

China

Number one in China and a major player in Asia: MTU Maintenance Zhuhai

Zhuhai
China

Number one in China and a major player in Asia: MTU Maintenance Zhuhai

ZHUHAI

Early player in Asia: customers of MTU Maintenance Zhuhai benefit from over 15 years of experience of the MTU Aero Engines and China Southern Air Holding joint venture. MTU Maintenance Zhuhai, which today has over 800 employees, was founded in 2001.

V2500 COMPETENCE AT MTU MAINTENANCE

Hannover: the centerpiece of the MTU Maintenance Group supports the IAE V2500-A1, the V2500-A5 and the V2500-D5.

Zhuhai: the location specializes in maintenance of the V2500-A5 engine.

Richmond: in Canada MTU carries out maintenance and repairs of the V2500-A5 and exclusively the military version V2500-E5.

Experts for V2500 and CFM56 engines

When Frank Bodenhage, president & CEO of MTU Maintenance Zhuhai, glances at the clock, it reads 11 a.m. local time in the Chinese special economic zone. That's 4 a.m. in central Europe. Bodenhage is satisfied: his team is on the point of successfully completing another V2500-A5 maintenance job. The "-A5" is the youngest and also most widespread member of the V2500 engine family, which powers the Airbus A320. Worldwide, its average age is a little over eight years. In terms of maintenance, this means the first full shop visits are still pending or have only recently taken place.

A V2500 engine undergoes a thorough inspection and overhaul at around every 15,000 to 30,000 flying hours. Regulatory requirements stipulate that specific components must be completely replaced, while others are closely inspected and repaired. The focus is always on ensuring that the strict safety regulations for aircraft engines are complied with at all times, as well as on restoring engine efficiency. With the experience gathered from over 1,000 V2500 shop visits under their belts, this is no problem for the engineers from MTU Maintenance Zhuhai. The

Precision has top priority at every step–here an MTU employee assembling a V2500 high-pressure turbine.

Everything under control: with a deft touch, a V2500 outlet nozzle is expertly assembled.

older an engine is, the greater the depth of repair–in other words the degree to which it is taken apart, examined, repaired and re-assembled during a shop visit. MTU's engineers in Zhuhai can draw on a high-tech pool of machinery, including a state-of-the-art test cell for subsequently testing the engine.

Apart from the V2500, the Zhuhai experts are no less experienced in maintaining the CFM56 engine: the portfolio includes the CFM56-3, -5B and -7B models, of which MTU's engineers have overhauled well in excess of 1,000 to date.

On the way to becoming number one in Asia

Thanks to this extensive expertise, MTU Maintenance Zhuhai, which was founded in 2001 as a 50/50 joint venture between MTU and China Southern Air Holding Company, has become the leading commercial MRO provider in China and a major player in Asia. Not content with this, however, Bodenhage, who has been Managing Director in Zhuhai since 2012, underscores the location's ambitious goal: "We want to go from being number one in China to being number one in Asia." Outlining the plans for the future, Bodenhage says: "The plant currently has an area of 40,000 square meters. We are planning to expand over the next few years to enable us to handle the expected higher demand." This will not be the first expansion: in 2012, the capacity was already increased by 50 percent–from 200 to 300 shop visits per year. Another auspicious factor for a renewed expansion is the market prospects: China is the world's fastest-growing market in the MRO sector–and with MTU Maintenance Zhuhai, customers can rely on an experienced local service partner.

BACKGROUND INFORMATION

V2500

The V2500 has been powering short- and medium-haul jets since 1989. In the summer of 2017, the engine of the IAE consortium broke the sound barrier of 100 million flight cycles. Worldwide, around 160 airlines in 80 countries place their trust in this safe, efficient and reliable engine to power more than 3,000 aircraft.

II. Notes to the consolidated income statement

1. Revenues

Revenues developed in the reporting period as follows:

Revenues

in € million	2017	2016
Commercial engine business		
Manufacturing	2,301.0	2,261.5
Other products	168.4	139.7
Total commercial engine business	**2,469.4**	**2,401.2**
Military engine business		
Manufacturing	198.9	298.8
Other products	205.4	205.2
Total military engine business	**404.3**	**504.0**
Total commercial and military engine business (OEM)	**2,873.7**	**2,905.2**
Commercial maintenance business (MRO)	**2,285.3**	**1,914.4**
Consolidation	–122.7	–86.9
Total revenues	**5,036.3**	**4,732.7**

The item “Other products” under the subheading “Military engine business” includes revenues from engine maintenance services.

A more detailed presentation of revenues, with tables showing external and intersegment revenues, their derivation from products and services, and their attribution to major customers, is provided in the section preceding these Notes, under “Reporting by operating segment”. Additional information can be found under “Operating results” in the combined management report.

2. Cost of sales

Cost of sales

in € million	2017	2016
Cost of materials	–3,672.1	–3,351.5
Personnel expenses	–518.5	–479.5
Depreciation and amortization	–191.2	–171.9
Other cost of sales	115.4	–71.9
Total cost of sales	**–4,266.4**	**–4,074.8**

The change in cost of sales is consistent with the growth in revenues in the reporting period and reflects the production ramp-up in connection with MTU’s share in new engine programs as well as the realized product mix in the commercial engine and maintenance business and the decline in military business.

The change in the item “Other cost of sales” was due to the effect of translation differences on trade payables and the increase in inventories of work in progress and finished products in the reporting year.

3. Research and development expenses

Company-funded research and development expenditure developed as follows:

Research and development expenses

in € million	2017	2016
Cost of materials	–98.2	–93.4
Personnel expenses	–68.2	–72.3
Depreciation and amortization	–1.4	–2.3
Company-funded research and development expenditure	**–167.8**	**–168.0**
of which the following amounts were capitalized:		
Development costs (OEM)	90.7	96.2
Development costs (MRO)	0.5	0.7
Capitalized development costs	**91.2**	**96.9**
Research and development costs recognized as expense	**–76.6**	**–71.1**

For more information, please refer to the “Research and development” section of the combined management report.

4. Selling expenses

Selling expenses

in € million	2017	2016
Cost of materials	–21.2	–18.6
Personnel expenses	–68.7	–63.3
Depreciation and amortization	–1.6	–1.4
Other selling expenses	–10.7	–20.7
Total selling expenses	**–102.2**	**–104.0**

Selling expenses comprise expenses for advertising and marketing, expenses in connection with air shows, trade fairs and exhibitions, media relations expenses, and valuation allowances and write-downs on trade receivables. The latter are mainly related to MRO activities and determine the development of "Other selling expenses".

5. General administrative expenses

General administrative expenses

in € million	2017	2016
Cost of materials	–6.9	–6.9
Personnel expenses	–59.2	–55.4
Depreciation and amortization	–2.0	–1.9
Other administrative expenses	–8.7	–6.6
Total general administrative expenses	**–76.8**	**–70.8**

General administrative expenses are expenses incurred in connection with administrative activities unrelated to development, production or sales activities.

6. Other operating income and expenses

Other operating income and expenses

in € million	2017	2016
Income		
Gains from the disposal of intangible assets and property, plant and equipment	0.4	0.1
Reimbursement of insurance claims	0.6	2.6
Rental income from		
property owned by MTU	1.2	2.2
sublet property owned by third parties	1.7	1.5
Sundry other operating income	4.0	10.8
Total other operating income	**7.9**	**17.2**
Expenses		
Losses from the disposal of intangible assets and property, plant and equipment	–5.6	–0.4
Expenses associated with insurance claims	–0.7	–2.9
Rental payments for sublet property	–1.7	–1.5
Sundry other operating expenses	–2.8	–2.3
Total other operating expenses	**–10.8**	**–7.1**
Balance of other operating income and expenses	**–2.9**	**10.1**

The MTU group does not hold any investment property. An insignificant part of the buildings recognized under property, plant and equipment is rented out to external third parties.

7. Profit/loss of companies accounted for using the equity method or at cost

Profit/loss of companies accounted for using the equity method or at cost

in € million	2017	2016
Profit / loss of companies accounted for using the equity method		
Associates	2.9	0.8
Joint Ventures	39.5	27.8
Total profit / loss of companies accounted for using the equity method	**42.4**	**28.6**
Profit / loss of companies accounted for at cost		
Cooperation entities	0.5	1.1
Other related companies	1.0	1.0
Total profit / loss of companies accounted for at cost	**1.5**	**2.1**

The development of business by the joint venture MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China, was responsible for a significant part of MTU's profit/loss of companies accounted for using the equity method.

8. Interest result

Interest result

in € million	2017	2016
Interest income	**5.8**	**0.8**
Interest expense on		
Corporate bonds and notes	–7.4	–11.5
Convertible bond	–4.5	–2.9
Liabilities to banks	–0.6	–0.9
Finance lease arrangements	–0.3	–0.4
Other interest expenses	–2.3	–2.8
Capitalized borrowing costs for qualifying assets	2.1	5.8
Interest expenses	**–13.0**	**–12.7**
Interest result	**–7.2**	**–11.9**
Thereof: on financial instruments classified in accordance with IAS 39 as:		
Loans and receivables	6.1	2.6
Available-for-sale financial assets		2.2
Financial liabilities measured at amortized cost	–13.0	–12.8

The increase in interest income year on year is due to higher interest income from extended loans for aircraft and engine financing activities required by MTU's partnership in commercial engine programs. In the financial year 2017, borrowing costs in the amount of € 2.1 million (2016: € 5.8 million), were capitalized for qualifying assets acquired or constructed mainly in connection with the group's stake in the PW1000G family and PW800 engine program. The capitalized amount was determined on the basis of a cost of debt capital of 2.2% (2016: 2.4%).

9. Financial result on other items

Financial result on other items

in € million	2017	2016
Effects from currency translation: exchange rate gains / losses on		
Currency holdings	–5.4	–3.4
Financing transactions	–7.3	0.1
Fair value gains / losses on derivatives		
Currency and interest rate derivatives	6.9	7.8
Forward commodity sales contracts	1.0	–0.3
Interest portion included in measurement of assets and liabilities		
relating to pension funds	–12.4	–16.3
Receivables, other provisions and liabilities	–15.6	–13.1
Financial result on sundry other items		–0.1
Financial result on other items	**–32.8**	**–25.3**
Thereof: on financial instruments classified in accordance with IAS 39 as:		
Financial assets at fair value through profit or loss	30.2	39.4
Financial liabilities at fair value through profit or loss	–22.3	–31.9

The financial result on other items includes all income and expense components of financial instruments classified as “held for trading” in accordance with IAS 39.

10. Income taxes

Recognized income taxes comprise current income taxes paid or payable in the countries in which the group operates, and deferred tax income or expense, including interest in connection with tax payments and refunds for prior periods resulting from tax audits.

Analysis of current and deferred tax expenses

in € million	2017	2016
Tax expense incurred in current period	–128.0	–104.9
Tax expense (-) / tax income incurred in prior periods	–6.4	3.5
Current tax expense	**–134.4**	**–101.4**
Deferred tax expense (-) / tax income resulting from temporary differences	–4.6	–10.2
Deferred tax expense (-) / tax income resulting from tax credits	2.8	2.7
Deferred tax expense (-) / tax income resulting from tax losses carried forward	2.7	5.9
Deferred tax income	**0.9**	**–1.6**
Recognized tax expense	**–133.5**	**–103.0**

In 2017, the tax expense incurred in prior periods includes interest expenses amounting to € 3.1 million (2016: interest income of € 0.1 million).

Tax reconciliation

As a basic principle, deferred tax assets and liabilities are measured using the tax rates that are expected to apply to the period when the asset is realized or the liability is settled, based on current tax legislation in the countries concerned.

In the financial year 2017, as in the previous year, the tax assets and liabilities of the German entities were measured using an income tax rate of 32.2%. This rate is unchanged and comprises the uniform corporation tax rate of 15.0% plus a solidarity surcharge of 5.5% on the calculated corporation tax expense, and takes into account an average municipal trade tax rate of 16.4%.

The tax assets and liabilities of companies outside Germany were measured using the relevant tax rates for the countries in question, which range between 19% and 26%.

Information on changes in deferred tax assets and liabilities is provided in Note 33 (Deferred tax assets and liabilities).

The following table shows reconciliation of expected tax expense to recognized tax expense:

Tax reconciliation

in € million	2017	2016
Earnings before tax	515.3	415.6
Income tax rate	32,2 %	32,2 %
Expected tax expense	**–165.9**	**–133.8**
Impact of		
Recognition and measurement adjustments and write-downs on deferred tax assets	17.9	8.1
Non-tax-deductible expenses and tax exempt income	–2.0	–2.1
Lower tax rate for companies outside Germany	5.7	1.6
Investments accounted for using the equity method	13.5	8.9
Tax field audit and prior periods	–4.6	9.0
Tax credits available for carry-forward	4.1	4.8
Withholding tax charge on dividends paid by foreign entities	–0.6	–1.6
Other impacts	–1.6	2.1
Recognized tax expense	**–133.5**	**–103.0**
Effective tax rate	**25.9%**	**24.8%**

11. Earnings per share

Diluted earnings per share are calculated by dividing net income by the sum obtained when the number of common shares that could potentially be issued through the granting of equity instruments is added to the weighted average number of outstanding shares.

In 2017, the group generated net income amounting to € 378.2 million (2016: € 312.2 million), which was made available for distribution to shareholders of MTU Aero Engines AG.

In the reporting period, the weighted average number of outstanding shares was 51,442,495 (2016: 51,262,220 shares). Based on these parameters, basic earnings per share amounted to € 7.35 in 2017 (2016: € 6.09).

Diluting effects arose from 4,007,370 shares that could potentially be issued through the convertible bond issued in May 2016, and from 263 shares that could potentially be issued through the Share Matching Plan (SMP), so that diluted earnings per share amounted to € 6.88 (2016: € 5.83).

12. Additional disclosures relating to the income statement

After adjustments to eliminate the effect of the depreciation and amortization of purchase price allocation (PPA) in connection with non-recurring items, and of the stake increase in the IAE/V2500, the following reconciliation produces the performance indicator “Earnings before interest and tax adjusted (EBIT adjusted)”:

Reconciliation of EBIT to EBIT adjusted, depreciation/amortization expense and non-recurring items

in € million	2017	2016
Earnings before interest and tax (EBIT)	**555.3**	**452.8**
+ Depreciation / amortization effect of purchase price allocation / V2500 stake increase		
Intangible assets	51.0	49.9
Property, plant and equipment	0.3	0.3
Adjusted earnings before interest and tax (EBIT adjusted)	**606.6**	**503.0**

Costs by function include the following personnel expenses items:

Personnel expenses

in € million	2017	2016
Wages and salaries	593.3	561.4
Social security, pension and other benefit expenses	114.3	102.6
Total personnel expenses	**707.6**	**664.0**

Pension benefits account for € 22.5 million (2016: € 15.9 million) of these expenses. Other social security expenses amounted to € 91.8 million (2016: € 86.7 million).

The average number of persons employed during the financial year 2017 breaks down as follows:

Disclosures relating to the average number of employees

in € million	2017	2016
Industrial staff	3,643	3,626
Administrative staff	3,828	3,730
Employees on temporary contracts	662	456
Trainees	281	308
Students on work experience projects	200	232
Total average number of employees	**8,614**	**8,352**

Costs by function include the following cost-of-materials items:

Cost of materials

in € million	2017	2016
Cost of raw materials and supplies	1,587.4	1,394.3
Cost of purchased services	2,092.8	1,978.6
Total cost of materials	**3,680.2**	**3,372.9**

The fees charged by the group auditor Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft in 2017 in accordance with Section 314 (1) no. 9 of the German Commercial Code (HGB) amounted to a total of € 1.1 million (2016: € 0.8 million).

Fees charged by the group auditor

in € million	2017	2016
Financial statement auditing services	1.0	0.7
Other independent auditing services	0.1	
Other independent services		0.1
Total fees charged by the group auditor	**1.1**	**0.8**

III. Notes to the consolidated balance sheet

13. Analysis of changes in intangible assets and property, plant and equipment

Changes in non-financial assets - cost of acquisition and construction 2017

in € million	Balance at Jan. 1, 2017	Translation differences	Additions	Transfers	Disposals	Balance at Dec. 31, 2017
Program assets	1,839.5	39.8	19.9			1,899.2
Program-independent technologies	124.7					124.7
Customer relations	56.5					56.5
Rights and licenses	132.2	–1.2	2.5	1.2	–0.6	134.1
Goodwill	392.2	–0.6				391.6
Development activities	521.4	–0.1	92.4		–11.2	602.5
Intangible assets	**3,066.5**	**37.9**	**114.8**	**1.2**	**–11.8**	**3,208.6**
Land, leasehold rights and buildings, including buildings on non-owned land	438.5	1.5	2.4	2.1	–0.5	444.0
Technical equipment, plant and machinery	558.1	1.2	19.0	35.8	–9.9	604.2
Other equipment, operational and office equipment	517.4	–0.3	90.8	2.7	–28.5	582.1
Advance payments and construction in progress	69.5	0.3	84.5	–41.8		112.5
Property, plant and equipment	**1,583.5**	**2.7**	**196.7**	**–1.2**	**–38.9**	**1,742.8**
Total	**4,650.0**	**40.6**	**311.5**		**–50.7**	**4,951.4**

Changes in non-financial assets - depreciation / amortization and carrying amount 2017

in € million	Balance at Jan. 1, 2017	Translation differences	Depreciation / amortization	Transfers	Disposals	Balance at Dec. 31, 2017	Carrying amount Dec. 31, 2017
Program assets	547.5	7.0	61.2			615.7	1,283.5
Program-independent technologies	124.7					124.7	
Customer relations	41.1		2.4			43.5	13.0
Rights and licenses	99.0	–1.2	9.0		–0.6	106.2	27.9
Goodwill							391.6
Development activities	20.0		14.2		–5.8	28.4	574.1
Intangible assets	**832.3**	**5.8**	**86.8**		**–6.4**	**918.5**	**2,290.1**
Land, leasehold rights and buildings, including buildings on non-owned land	139.0	–0.1	10.3		–0.1	149.1	294.9
Technical equipment, plant and machinery	433.0	0.1	41.5	3.5	–9.0	469.1	135.1
Other equipment, operational and office equipment	330.0	–0.2	57.6	–3.5	–22.7	361.2	220.9
Advance payments and construction in progress							112.5
Property, plant and equipment	**902.0**	**–0.2**	**109.4**		**–31.8**	**979.4**	**763.4**
Total	**1,734.3**	**5.6**	**196.2**		**–38.2**	**1,897.9**	**3,053.5**

Changes in non-financial assets - cost of acquisition and construction 2016

in € million	Balance at Jan. 1, 2016	Translation differences	Additions	Transfers	Disposals	**Balance at Dec. 31, 2016**
Program assets	1,849.1	–24.3	14.7			1,839.5
Program-independent technologies	124.7					124.7
Customer relations	56.5					56.5
Rights and licenses	128.7	0.2	1.9	2.0	–0.6	132.2
Goodwill	392.1	0.1				392.2
Development activities	422.6		98.8			521.4
Intangible assets	**2,973.7**	**–24.0**	**115.4**	**2.0**	**–0.6**	**3,066.5**
Land, leasehold rights and buildings, including buildings on non-owned land	433.6	–0.8	3.7	2.0		438.5
Technical equipment, plant and machinery	524.3	–0.1	20.3	23.9	–10.3	558.1
Other equipment, operational and office equipment	452.4		84.3	12.0	–31.3	517.4
Advance payments and construction in progress	58.5	–0.2	51.1	–39.9		69.5
Property, plant and equipment	**1,468.8**	**–1.1**	**159.4**	**–2.0**	**–41.6**	**1,583.5**
Total	**4,442.5**	**–25.1**	**274.8**		**–42.2**	**4,650.0**

Changes in non-financial assets - depreciation/amortization and carrying amount 2016

in € million	Balance at Jan. 1, 2016	Translation differences	Depreciation / amortization	Disposals	**Balance at Dec. 31, 2016**	**Carrying amount Dec. 31, 2016**
Program assets	496.2	–3.2	54.5		547.5	1,292.0
Program-independent technologies	124.7				124.7	
Customer relations	38.7		2.4		41.1	15.4
Rights and licenses	90.3	0.3	9.0	–0.6	99.0	33.2
Goodwill						392.2
Development activities	9.8		10.2		20.0	501.4
Intangible assets	**759.7**	**–2.9**	**76.1**	**–0.6**	**832.3**	**2,234.2**
Land, leasehold rights and buildings, including buildings on non-owned land	125.5	0.1	13.4		139.0	299.5
Technical equipment, plant and machinery	408.0	0.2	34.7	–9.9	433.0	125.1
Other equipment, operational and office equipment	303.3	0.1	53.3	–26.7	330.0	187.4
Advance payments and construction in progress						69.5
Property, plant and equipment	**836.8**	**0.4**	**101.4**	**–36.6**	**902.0**	**681.5**
Total	**1,596.5**	**–2.5**	**177.5**	**–37.2**	**1,734.3**	**2,915.7**

14. Intangible assets

Intangible assets mainly comprise program assets and program-independent technologies, a portion of which were capitalized as part of the purchase price allocation in connection with the acquisition by Kohlberg Kravis Roberts & Co. Ltd. (KKR) on January 1, 2004, of the shareholding in MTU previously held by DaimlerChrysler AG, and acquired goodwill. This item also includes capitalized development costs and software (the latter mostly for engineering applications).

In the financial year 2017, capitalized intangible assets totaling € 114.8 million (2016: € 115.4 million) were recognized, of which € 66.8 million (2016: € 62.5 million) were internally generated. New engine programs accounted for € 109.2 million (2016: € 112.8 million) of this amount, while € 82.9 million (2016: € 90.0 million) derived from the partnership with Pratt & Whitney in commercial engine programs and € 26.3 million (2016: € 22.8 million) from the collaboration with GE.

Other additions to program assets in the financial year 2017 include an amount of € 2.6 million (2016: € 5.6 million) arising from the measurement of the IAE V2500 stake increase as a result of the revaluation of the corresponding conditional purchase price obligation.

The amortization expense on intangible assets is presented in the following line items at the following amounts: cost of sales € 84.8 million (2016: € 75.2 million), research and development expenses € 1.0 million (2016: € 0.3 million), selling expenses € 0.6 million (2016: € 0.3 million), and general administrative expenses € 0.4 million (2016: € 0.3 million). Significant intangible assets are program assets for which the cost of acquisition and construction exceeds € 100 million. They are amortized on a straight-line basis over a period of up to 30 years.

Disposals in the reporting year mainly relate to discontinued development of repair techniques that have become obsolete.

15. Property, plant and equipment

Through its capital expenditure on property, plant and equipment, MTU aims to expand its production capacity and modernize equipment and machinery to state-of-the-art standards.

In the financial year 2017, the group's total capital expenditure on property, plant and equipment amounted to € 196.7 million (2016: € 159.4 million). The depreciation expense on property, plant and equipment is included in the presentation of the following line items: cost of sales € 106.2 million (2016: € 96.7 million), research and development expenses € 0.5 million (2016: € 2.0 million), selling expenses € 1.1 million (2016: € 1.1 million), and general administrative expenses € 1.6 million (2016: € 1.6 million).

Additions to land, leasehold rights and buildings, including buildings on non-owned land, in the financial year 2017 amounted to € 2.4 million (2016: € 3.7 million) and relate mainly to buildings and fittings at the locations in Munich, Hannover and Rzeszów, Poland.

Capital expenditure on technical equipment, plant and machinery totaling € 19.0 million (2016: € 20.3 million) relates mainly to the purchase of plant and machinery for the production of engine modules belonging to the GTF product family.

The capital expenditure on other equipment, operational and office equipment in the amount of € 90.8 million (2016: € 84.3 million) and additions to advance payments and construction in progress in the financial year 2017 in the amount of € 84.5 million (2016: € 51.1 million) relate to the expansion of production capacities at the sites in Germany and Poland.

Capitalized assets under finance lease agreements are based on the following components:

Lease payments under finance lease agreements

in € million	2017	2016
Lease payments		
Due in less than one year	1.9	1.7
Due in more than one year and less than five years	5.0	5.7
Due in more than five years	4.5	4.2
Total future minimum lease payments	**11.4**	**11.6**
Interest included in lease payments		
Due in less than one year	0.2	0.2
Due in more than one year and less than five years	0.5	0.4
Due in more than five years	1.6	1.7
Total interest portion of future minimum lease payments	**2.3**	**2.3**
Present value of lease payments		
Due in less than one year	1.7	1.5
Due in more than one year and less than five years	4.5	5.3
Due in more than five years	2.9	2.5
Total present value of future minimum lease payments	**9.1**	**9.3**

A net carrying amount of € 8.5 million (2016: € 9.5 million) was recognized for the capitalized assets under finance lease agreements at the reporting date. Property, plant and equipment acquired under such agreements are subject to restrictions of use.

The most significant leased asset is a logistics center in Langenhagen, for which a net carrying amount of € 5.7 million (2016: € 5.8 million) was capitalized at December 31, 2017.

The lessor is Wirtschaftsförderungs-Gesellschaft Langenhagen Flughafen mbH (WFG). The center is situated on land owned partly by MTU and partly by the Entwicklungsgesellschaft Langenhagen mbH. In order to construct this facility, MTU acquired heritable building rights from WFG permitting the site and its buildings to be utilized for a total period of 33 years. The lease became effective in 2013 and has a fixed contractual term that expires at the end of 2025, with a renewal option that allows the contract to be extended for additional periods of 5 years. The lease payments are on a level with those normally charged in the region and include ground rent, interest charges, depreciation charges and administrative expenses. MTU is responsible for the upkeep of the property, including general maintenance and repairs. The contract also includes a clause allowing MTU to purchase the real estate, comprising land and buildings, based on terms equivalent to those that prevail in arm's-length transactions.

In 2014 and 2017, to take advantage of the attractive financing conditions, MTU adopted the finance lease model to fund the expansion of production capacity at its Munich location through the addition of technical equipment, plant and machinery and of operational and office equipment. At December 31, 2017, the carrying amount of assets financed in this way amounted to € 2.8 million (2016: € 3.6 million). The majority of the underlying finance lease agreements run for contractual periods up to 2021. At the end of the contractual period, the machinery becomes the property of MTU. The agreements do not include price adjustment clauses.

16. Financial assets

Financial assets accounted for using the equity method

The financial assets accounted for in the consolidated financial statements using the equity method amounted to € 291.5 million at the reporting date (2016: € 201.9 million).

Associated companies

Information on the principal associated companies in which MTU holds an equity share is provided in the tables below:

Principal investments in associates

Name of associate	Domicile	Share-holding
IAE International Aero Engines AG,	Zurich, Switzerland	25,25 %
IAE International Aero Engines LLC.	East Hartford, USA	18,00 %
PW1100G-JM Engine Leasing LLC.	East Hartford, USA	18,00 %

All companies listed in the table are accounted for in these consolidated financial statements using the equity method.

IAE International Aero Engines AG, Zurich, Switzerland was formed for the purpose of coordinating the development, production and marketing of the V2500 engine and the provision of related services.

IAE International Aero Engines LLC., East Hartford, USA develops, manufactures and provides MRO services for PW 1100G-JM engines.

PW 1100G-JM Engine Leasing LLC., East Hartford, USA leases out replacement engines of the PW 1100G-JM series.

A summary of non-audited financial data for the principal associated companies in the reporting period is provided below:

Condensed financial information of the principal investments in associates

in € million	2017			2016		
	IAE International Aero Engines AG	IAE International Aero Engines LLC.	PW1100G-JM Engine Leasing LLC.	IAE International Aero Engines AG	IAE International Aero Engines LLC.	PW1100G-JM Engine Leasing LLC.
Balance Sheet at December 31						
Current assets	2,485.0	2,226.7	66.9	2,472.8	1,013.0	61.5
Non-current assets	325.4	44.3	666.5	338.4	3.8	160.3
Current liabilities	1,192.1	2,230.1	293.6	1,315.1	1,013.6	71.2
Non-current liabilities	1,541.5	35.3		1,413.1		
Equity	76.8	5.6	439.8	83.0	3.2	150.6
Proportional share of equity	19.4	1.1	79.2	21.0	0.5	27.1
Reconciliation	3.5		28.3	4.6		–0.4
Carrying amount of companies accounted for using the equity method	22.9	1.1	107.5	25.6	0.5	26.7
Income Statement Data						
Revenues	3,536.9	377.4	53.0	3,170.7	175.0	5.2
Net income	4.7	3.1	33.9	4.2	2.2	2.6
Other comprehensive income						
Total comprehensive income	4.7	3.1	33.9	4.2	2.2	2.6

The reconciliation of the carrying amount of PW1100G-JM Engine Leasing LLC., Rocky Hill, USA, accounted for using the equity method already includes the capital increase meanwhile carried out in January 2018 as per December 31, 2017.

Joint ventures

Information on the principal joint ventures in which MTU holds an equity share is provided in the tables below:

Principal joint ventures

Name of joint venture	Domicile	Share-holding
MTU Maintenance Zhuhai Co. Ltd.	Zhuhai, China	50 %
Airfoil Services Sdn. Bhd.	Kota Damansara, Malaysia	50 %
Ceramic Coating Center S.A.S.	Paris, France	50 %
AES Aerospace Embedded Solutions GmbH	Munich, Germany	50 %
Pratt & Whitney Canada Customer Service Centre Europe GmbH	Ludwigsfelde, Germany	50 %
EME Aero sp. z o.o.	Jasionka, Poland	50 %

All companies listed in the above table are accounted for using the equity method in the 2017 consolidated financial statements.

MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China, specializes in the maintenance, repair and overhaul of V2500 (IAE) and CFM56 (CFMI) engines, and serves the regions of China and Southeast Asia.

The business purpose of Airfoil Services Sdn. Bhd., Kota Damansara, Malaysia, is the repair of blades used in low-pressure turbines and high-pressure compressors.

Ceramic Coating Center S.A.S., Paris, France, specializes in high-tech coatings. One of its most important products is high-performance ceramic thermal insulation coatings for turbine parts.

AES Aerospace Embedded Solutions GmbH, Munich, develops safety-critical software and hardware for applications in military and commercial aviation. A focal point of the company is its access to numerous future development programs in the aerospace and defense industries around the globe.

The business purpose of Pratt & Whitney Canada Customer Service Centre Europe GmbH, Ludwigsfelde, is the marketing of engine maintenance services for selected Pratt & Whitney Canada engines to customers in Europe, Africa and the Middle East.

EME Aero sp. z o.o. plans to carry out maintenance on the PW1000G series of Geared Turbofan™ engines, which power the Airbus A320neo family and other aircraft.

The table below provides a summary of non-audited financial data concerning the principal joint ventures in the MTU group for the reporting period:

Income statement data, statements of comprehensive income and balance sheets of the principal joint ventures 2017

in € million	Pratt & Whitney Canada Customer Service Centre Europe GmbH	Ceramic Coating Center S.A.S.	AES Aerospace Embedded Solutions GmbH	Airfoil Services Sdn. Bhd.	Engine Maintenance Europe Aero sp. z o.o. [1]	MTU Maintenance Zhuhai Co. Ltd.
Income statement data disclosures						
Revenues	185.8	6.0	17.6	34.0		876.6
Depreciation / amortization and valuation allowances	–0.2	–0.7	–0.3	–1.4		–4.4
Interest income	0.2		0.1			0.1
Interest expenses						–6.7
Income tax credits						
Income tax expense	–0.8	–0.2		–2.9		–10.6
Other income and expenses	–182.2	–4.6	–16.8	–18.2		–794.6
Net income	**2.8**	**0.5**	**0.6**	**11.5**		**60.4**
Other comprehensive income			–0.1	–2.8		
Total comprehensive income	**2.8**	**0.5**	**0.5**	**8.7**		**60.4**
Balance sheet disclosures						
Non-current assets	0.8	4.0	1.3	15.3		78.6
Cash and cash equivalents	60.2	0.3	5.3	11.6	2.4	56.7
Other current assets	42.3	4.4	3.2	6.5		560.6
Total assets	**103.3**	**8.7**	**9.8**	**33.4**	**2.4**	**695.9**
Equity	14.6	6.5	3.6	25.2	2.4	267.4
Non-current financial liabilities						70.4
Other non-current liabilities			1.9	2.0		
Current financial liabilities	31.4	1.5	0.4	6.2		294.1
Other current liabilities	57.3	0.7	3.9			64.0
Total equity and liabilities	**103.3**	**8.7**	**9.8**	**33.4**	**2.4**	**695.9**
Reconciliation of carrying amount						
Proportional share of equity	7.3	3.2	1.8	12.6	1.2	133.7
Reconciliation of carrying amount					0.2	
Carrying amount of companies accounted for using the equity method	**7.3**	**3.2**	**1.8**	**12.6**	**1.4**	**133.7**
Dividend received from the joint ventures	**2.1**			**4.7**		**12.6**

[1] New joint venture created in 2017

The non-audited comparative data for 2016 are as follows:

Income statements, statements of comprehensive income and balance sheets of the principal joint ventures 2016

in € million	Pratt & Whitney Canada Customer Service Centre Europe GmbH	Ceramic Coating Center S.A.S.	AES Aerospace Embedded Solutions GmbH	Airfoil Services Sdn. Bhd.	MTU Maintenance Zhuhai Co. Ltd.
Income statement disclosures					
Revenues	199.3	6.6	16.8	26.8	693.6
Depreciation / amortization and valuation allowances	–0.3	–0.6	–0.5	–1.7	–4.8
Interest income					0.1
Interest expenses			–0.1		–3.2
Income tax credits					
Income tax expense	–2.8	–0.3		–1.4	–13.8
Other income and expenses	–192.0	–5.1	–15.6	–16.9	–628.0
Net income	**4.2**	**0.6**	**0.6**	**6.8**	**43.9**
Other comprehensive income			–0.1	1.2	
Total comprehensive income	**4.2**	**0.6**	**0.5**	**8.0**	**43.9**
Balance sheet disclosures					
Non-current assets	1.3	4.0	1.4	17.5	80.3
Cash and cash equivalents	65.3	0.3	3.5	8.6	28.7
Other current assets	47.2	3.0	3.4	9.1	516.6
Total assets	**113.8**	**7.3**	**8.3**	**35.2**	**625.6**
Equity	15.9	6.1	3.2	27.5	248.9
Non-current financial liabilities					72.2
Other non-current liabilities				1.5	
Current financial liabilities	48.2	0.5	4.2	6.2	255.1
Other current liabilities	49.7	0.7	0.9		49.4
Total equity and liabilities	**113.8**	**7.3**	**8.3**	**35.2**	**625.6**
Reconciliation of carrying amount					
Proportional share of equity	8.0	3.0	1.6	13.7	124.4
Reconciliation of carrying amount			–1.6		
Carrying amount of companies accounted for using the equity method	**8.0**	**3.0**		**13.7**	**124.4**
Dividend received from the joint ventures				**2.2**	**15.6**

The reporting date for Ceramic Coating Center S.A.S., Paris, France, and for Pratt & Whitney Canada Customer Service Centre Europe GmbH, Ludwigsfelde, Germany, is November 30 of each calendar year.

Other financial assets

The carrying amounts of financial assets included in the consolidated financial statements are presented below:

Composition of other financial assets

	Total		Non-current		Current	
in € million	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016
Loans and receivables (LaR) and sundry other financial assets	**190.2**	**144.3**	**127.0**	**126.4**	**63.2**	**17.9**
Loans to third parties[1]	133.5	98.6	101.6	98.6	31.9	
Loans to related companies[1]	20.3	23.9	20.3	23.9		
Receivables from employees	1.1	1.1			1.1	1.1
Receivables from suppliers	2.1	1.7			2.1	1.7
Sundry other financial assets	33.2	19.0	5.1	3.9	28.1	15.1
Available-for-sale financial assets (AfS)	**3.4**	**28.4**	**3.4**	**3.4**		**25.0**
Other interests in related entities	3.4	3.4	3.4	3.4		
Securities[1]		25.0				25.0
Derivatives without hedging relationship (FAHfT)	**1.8**		**1.5**		**0.3**	
Derivatives with hedging relationship (n.a.)	**85.6**	**0.4**	**35.9**	**0.4**	**49.7**	
Total other financial assets	**281.0**	**173.1**	**167.8**	**130.2**	**113.2**	**42.9**

[1] Included in net financial debt

The additions to loans to third parties relate primarily to participation in loan arrangements for the purpose of financing aircraft and aircraft engines within the context of MTU's stake in commercial engine programs.

The receivables from suppliers primarily include short-term credit notes which were received for returned goods, amendments to invoices, and trade discounts.

Sundry other financial assets amounting to € 33.2 million (2016: € 19.0 million) relate mainly to outstanding credit notes for trade discounts as well as to a multiplicity of separate non-significant items. At the reporting date, these financial assets, and the receivables from employees and suppliers, did not require adjustment and were not past due.

Other interests in related companies include the carrying amounts of MTU's share in companies that are neither consolidated nor accounted for using the equity method.

At the reporting date, derivative financial assets comprised the following instruments:

Derivative financial instruments

	Total		Non-current		Current	
in € million	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016
Forward foreign exchange contracts	85.6	0.4	35.9	0.4	49.7	
Currency options / nickel forward contracts	1.8		1.5		0.3	
Total derivative financial instruments	**87.4**	**0.4**	**37.4**	**0.4**	**50.0**	

17. Inventories

The carrying amount of inventories, considering valuation allowances, comprises the following components:

Inventories

in € million	Change in valuation allowance	Dec. 31, 2017 gross	Dec. 31, 2017 Valuation allowance	Dec. 31, 2017 Carrying amount	Dec. 31, 2016 gross	Dec. 31, 2016 Valuation allowance	Dec. 31, 2016 Carrying amount
Raw materials and supplies	–7.6	409.4	–37.8	371.6	437.5	–30.2	407.3
Work in progress	–1.2	286.2	–7.4	278.8	247.8	–6.2	241.6
Finished goods	–9.8	360.9	–32.9	328.0	375.6	–23.1	352.5
Advance payments		19.5		19.5	21.3		21.3
Total inventories	**–18.6**	**1,076.0**	**–78.1**	**997.9**	**1,082.2**	**–59.5**	**1,022.7**

Out of the total volume of inventories, an amount valued at € 329.5 million (2016: € 218.5 million) was considered to be impaired at the reporting date.

18. Trade receivables

Trade receivables

in € million	Dec. 31, 2017	Dec. 31, 2016
Third parties	538.7	574.9
Related companies	198.2	117.2
Total trade receivables	**736.9**	**692.1**

Transactions with related companies are presented in more detail in Note 38 (Relationships with related companies and persons).

The valuation allowances on trade receivables changed as follows:

Valuation allowances

in € million	2017	2016
Allowances at January 1	**14.7**	**7.1**
Translation differences	–0.2	0.1
Additions	4.8	8.5
Utilized	–2.4	–1.0
Reversed	–5.1	
Allowances at December 31	**11.8**	**14.7**

The additions to this item in 2017 are consistent with changes in the credit standing of specific customers (non-payment risk) and changed country risk classifications (market risk) in the commercial OEM business. The net expense for trade receivables written off as uncollectable offset against corresponding collected revenues amounted to € 0.3 million (2016: € 0.3 million).

As in prior years, all expense and income amounts arising from valuation allowances and the write-off of uncollectable trade receivables are recognized as selling expenses.

The following table shows the impairment status and due dates of trade receivables and of construction contract and service business receivables (see Note 19) at the reporting date:

Impairment status / due dates of trade receivables and of construction contract and service business receivables

in € million	Dec. 31, 2017	Dec. 31, 2016
Neither impaired nor past due at the reporting date	**1,207.7**	**1,085.5**
Not impaired and past due in the following time windows	**122.2**	**206.6**
Less than 90 days	76.5	80.9
Between 90 and 180 days	18.3	51.7
Between 181 and 360 days	8.7	55.3
More than 360 days	18.7	18.7
Impaired	**15.5**	**14.7**
Total receivables before deduction of valuation allowances	**1,345.4**	**1,306.8**
Valuation allowances	–11.8	–14.7
Total receivables	**1,333.6**	**1,292.1**

The majority of the impaired receivables are due in more than 360 days.

In order to minimize the non-payment risk, an active receivables management system is operated both in the OEM segment, partly with the support of the consortium leaders, and in the MRO segment. Should doubts arise as to a debtor's creditworthiness, the corresponding receivables are written down to the amount that is likely to be recovered.

19. Construction contract and service business receivables

Construction contract and service business receivables

in € million	Dec. 31, 2017	Dec. 31, 2016
Construction contract receivables (based on percentage of completion)	307.4	360.2
Thereof: Advance payments received for construction contracts	–142.7	–206.8
Service business receivables (based on percentage of completion)	289.3	239.8
Total construction contract and service business receivables	**454.0**	**393.2**

Advance payments directly attributable to a specific construction contract are offset against the amount of receivables for that contract. If the amount of the directly attributable advance payments received exceeds the amount of the receivables, the balance is recognized under construction contract payables (see Note 30).

The overall increase in construction contract and service business receivables compared with the previous year in particular reflects the percentage of completion of contracts in the commercial MRO service business for which settlement will be received at a later date. No amounts were retained for partial settlement of construction contract receivables at the reporting date.

Construction contracts in progress at the reporting date

in € million	Dec. 31, 2017	Dec. 31, 2016
Incurred construction costs incl. recognized profits and losses	773.4	737.2
Partial settlements	–466.0	–377.0
Total construction contract receivables	**307.4**	**360.2**

In the financial year 2017, revenues arising from construction contracts amounting to € 103.4 million (2016: € 213.5 million) were recognized using the percentage-of-completion method, measured on the basis of the relative proportion of contract costs incurred or on the basis of milestones reached. The drop in revenues arising from construction contracts is attributable to the advanced stage of completion of a multi-year contract for delivery of EJ200 engines.

20. Other assets

Other assets include claims for tax refunds amounting to € 30.8 million (2016: € 33.0 million) in respect of transactional taxes and prepaid maintenance charges, insurance premiums and rents.

21. Cash and cash equivalents

The cash and cash equivalents amounting to € 106.1 million (2016: € 322.4 million) comprise cash in hand and bank deposits. This item also includes foreign currency holdings amounting to the equivalent of € 105.8 million (2016: € 81.0 million).

22. Income tax receivables

At the reporting date, recognized recoverable income taxes (income tax claims) amounted to € 31.3 million (2016: € 21.1 million). Of this amount, € 29.9 million (2016: € 20.9 million) relates to income tax claims against the German tax authority.

23. Deferred tax assets

Deferred tax assets decreased in 2017 by € 1.4 million to € 55.2 million (2016: € 56.6 million). For more details, please refer to Note 33 (Deferred tax assets and liabilities).

24. Equity

Changes in group equity are set out in the consolidated statement of changes in equity.

Subscribed capital

The company's subscribed capital (capital stock) is unchanged at € 52.0 million and is divided into 52.0 million non-par bearer shares.

Authorized capital

The Executive Board in authorized until April 14, 2020, to increase the company's capital stock by up to € 15.6 million (15.6 million shares), with the prior approval of the Supervisory Board, by issuing, either in a single step or in several steps, new registered non-par-value shares in return for cash contributions (Authorized capital 2015).

Conditional capital

At the Annual General Meeting on April 15, 2015, the Executive Board was authorized until April 14, 2020, to issue conditional capital increases with the prior approval of the Supervisory Board:

This authorization allows the Executive Board to increase the company's capital stock by up to € 5.2 million through the issue of up to 5,200,000 new registered non-par-value shares, each corresponding to a proportional amount (one euro) of the company's total capital stock. The purpose of this conditional capital increase is to issue shares to holders or creditors of convertible bonds and/or bonds with warrants.

The Executive Board is authorized until April 14, 2020 to issue, in a single step or in several steps and with the prior approval of the Supervisory Board, bearer convertible bonds and/or bonds with warrants (collectively referred to as "securities") with or without maturity date, with a total nominal value of up to € 500 million. At the same time, the creditors are to be granted the right, obligation or option to convert the bonds into registered non-par-value shares of the company representing a stake in the capital stock of up to € 5.2 million under the conditions established for the issue of convertible bonds or bonds with warrants. The bonds may be issued in return for cash contributions only. They may be issued in euros or in any other legal currency. They may also be issued by an affiliated company in which MTU holds a controlling interest. In such cases, and subject to the prior approval of the Supervisory Board, the Executive Board is authorized to act on behalf of the company as guarantor for the bonds. In 2016, MTU made use of the authorization for a conditional capital increase by issuing a convertible bond with a nominal value of € 500 million. For more details, please refer to Note 28 (Financial liabilities).

Capital reserves

Capital reserves include premiums from the issue of shares, the equity component (net of proportional transaction costs) of a bond already repaid/converted, and the equity component pursuant to IAS 32.31 of the convertible bond issued in the prior period.

Capital reserves additionally include the difference between the fair value and the carrying amount of the treasury shares sold under the terms of the Restricted Stock Plan or the MAP employee stock program or the Stock Matching Plan (SMP) and, previously, the Matching Stock Plan (MSP).

Revenue reserves

Revenue reserves comprise the post-acquisition and non-distributed earnings of consolidated group companies.

Treasury shares

Purchase of treasury shares in accordance with the authorization granted by the Annual General Meeting on April 15, 2015
The Executive Board of MTU Aero Engines AG, Munich, has been authorized by resolution of the Annual General Meeting to buy back treasury shares. These shares may be purchased on the stock market or by means of a public offering addressed to all shareholders. The purchase price paid in consideration of these shares must not exceed or undercut the market value by more than 10%, net of any supplementary transaction fees.

The Executive Board of MTU was thus authorized to purchase treasury shares with an aggregate nominal value not exceeding 10% of the company's issued capital stock, as applicable on the date of the resolution, during the period from April 15, 2015 through April 14, 2020, pursuant to Section 71 (1) item 8 of the German Stock Corporation Act (AktG). At no point in time may the value of the acquired shares, together with other treasury shares in the company's possession or which are assigned to it pursuant to Section 71a et seq. of the German Stock Corporation Act (AktG), exceed 10% of the company's capital stock.

Purchase of treasury shares
The shares purchased by MTU in prior years serve the purpose of issuing shares in connection with the MAP employee stock option program, and to make shares available for issue under the Restricted Stock Plan (RSP). As in 2016, MTU did not purchase any treasury shares in the financial year 2017.

Reconciliation of weighted average number of outstanding shares
In the financial year 2017, the weighted average number of outstanding shares totaled 51,442,495 (2016: 51,262,220). At December 31, 2017, the number of outstanding shares of MTU Aero Engines AG, Munich totaled 51,499,842 (2016: 51,356,103). The number of treasury shares at December 31, 2017 amounted to 500,158 (December 31, 2016: 643,897).

Issue of shares
Based on the new compensation system in effect as from the financial year 2016, 20,594 (2016: 24,804) treasury shares were sold to the eligible senior managers, and 9,932 (2016: 35,489) to the Executive Board.

A total of 113,213 shares (2016: 177,086 shares) were sold to group employees in the financial year 2017 under the MAP employee stock program, of which 13,470 treasury shares (2016: 29,992 shares) were sold to eligible senior managers.

Accumulated other equity

In the financial year 2017, accumulated other equity was increased by € 154.7 million to a negative balance of € 178.1 million (2016: a negative balance of € 332.8 million), in particular as a result of the increase in the fair value of foreign exchange rate hedging instruments.

The table shows the income and expenses recognized in other comprehensive income, including the associated deferred amounts of income taxes:

Items recognized in other comprehensive income

in € million	2017 before	2017 Income taxes	2017 after	2016 before	2016 Income taxes	2016 after
Exchange differences arising from the translation of foreign entities accounted for using the equity method	–13.5		–13.5	–2.2		–2.2
Exchange differences arising from the translation of other consolidated foreign entities	3.8		3.8	–3.3		–3.3
Exchange differences arising from the translation of foreign entities	**–9.7**		**–9.7**	**–5.5**		**–5.5**
Actuarial gains and losses on plan assets and pension obligations	19.1	–6.3	12.8	–79.9	25.6	–54.3
Financial instruments designated as cash flow hedges	209.5	–58.5	151.0	1.2	–2.8	–1.6
Income and expense recognized in other comprehensive income	**218.9**	**–64.8**	**154.1**	**–84.2**	**22.8**	**–61.4**

Disclosures relating to capital management

MTU strives to maintain a strong financial profile in the interests of assuring the company's continued existence as a going concern within a flexible financing framework and of generating confidence on the part of its shareholders. It observes the statutory requirements on capital maintenance as part of its capital management and the company's articles of association do not stipulate any capital requirements. In general, the dividend policy is based on distributing around 30% of the adjusted annual net income to shareholders if the financial situation permits this and the corporate bodies give their approval. The group's capital management activities are focused on optimizing the balance between equity and net financial debt. For a description of the financial indicators MTU is obliged to meet in the context of its liabilities to banks, please refer to Note 28 (Financial liabilities).

25. Pension provisions

Defined benefit and defined contribution plans are in place for MTU employees. In the case of defined contribution plans, the company has no further obligations beyond the payment of contributions to the plan. In the case of defined benefit plans, the company has an obligation to fulfill commitments to current and former employees. For group companies in Germany, these benefits are financed primarily by provisions recognized in the financial statements, which are covered only to a minor extent by plan assets. In contrast, MTU Maintenance Canada Ltd., Richmond, Canada, has a fund-financed retirement benefit plan.

In some cases, it is difficult to differentiate between defined contribution and defined benefit plans. In Germany, for example, a minimum level of benefits is guaranteed for defined contribution plans, such that, even when the plan is organized via an external fund or insurance company, it is still the employer that remains liable. The so-called "ultimate liability of the employer" is governed by Section 1 (1) sentence 3 of the German Law on Retirement Pensions (BetrAVG). For financial reporting purposes, the term "defined benefit plan" is required to be interpreted on the basis of the underlying economic substance of the arrangement. Insofar as the MTU group has no major obligations beyond its so-called ultimate liability once the contributions have been paid to state and private retirement funds, these plans are classified as defined contribution plans. Current contributions are recognized as expenses in the period in which payments are made.

Defined contribution plans

Since January 1, 2007, no direct pension commitments have been granted to new employees in Germany other than senior managers. Instead, for employees who joined the company after that date, MTU paid contributions in the amount of € 1.5 million in 2017 (2016 € 1.3 million) to a company-sponsored external fund. Other plans that exist within the MTU group are direct insurance contracts funded by employee contributions.

Employer's contributions to the state pension scheme in the financial year 2017 totaled € 41.2 million (2016: € 39.1 million).

Defined benefit plans

The pension obligations of MTU are measured using the projected unit credit method in accordance with IAS 19, taking account of future salary and pension increases and other adjustments expected to be made to benefits and pension plans. The provision for defined benefit plans recognized in the balance sheet corresponds to the present value of the benefits payable for current and past service (the defined benefit obligation) of beneficiaries less the fair value of plan assets at the reporting date. An extensive actuarial analysis is carried out annually for each pension plan by independent actuaries.

Actuarial gains or losses may arise in connection with increases or decreases either in the present value of the defined benefit obligation or in the fair value of the plan assets. Causes of actuarial gains or losses include the effect of changes in the measurement parameters, changes in the assessment of risks on pension obligations, and differences between the actual return on plan assets and the proportional share of interest on the net liability.

In order to calculate the funding status or the pension obligation recognized, the present value of the provision-financed and fund-financed obligations is offset against the fair value of the plan assets. In Germany, there are no laws or regulations stipulating a minimum required allocation of funds in this context.

The present value and funding status of the defined benefit obligation is as follows:

Present value of Defined Benefit Obligation (DBO)

in € million	Dec. 31, 2017	Dec. 31, 2016
Present value of provision-financed pension obligations	870.9	883.0
Fair value of plan assets	–0.2	–0.2
Total Germany	**870.7**	**882.8**
Present value of fund-financed pension obligations	27.3	28.2
Fair value of plan assets	–27.7	–27.7
Total foreign countries (negative value = plan assets surplus)	**–0.4**	**0.5**
Recognized pension obligations	**870.3**	**883.3**

The following parameters were applied to measure the pension obligations at December 31 of the respective year and to measure the pension plan expense in the respective reporting period:

Actuarial assumptions: Germany

in %	Dec. 31, 2017	Dec. 31, 2016
Interest rate for accounting purposes	1.52	1.35
Salary trend	2.70	2.70
Pension trend	1.75	1.75

Actuarial assumptions: other countries

in %	Dec. 31, 2017	Dec. 31, 2016
Interest rate for accounting purposes	3.00	3.25
Salary trend	3.00	3.00
Pension trend	2.50	2.50

The market yields on high-quality, fixed-interest corporate bonds with similar maturities in Germany increased slightly compared with 2016. In view of the duration of the obligations, which currently stands at 12 years, pension obligations were discounted at December 31, 2017, using a discount rate of 1.52%. The biometric tables issued by Prof. Dr. Heubeck (RT 2005G) were used for the purpose of measuring the obligations of pension plans in Germany. In the case of group companies in other countries, up-to-date biometric assumptions for each relevant country were applied. The expected salary trend refers to the expected rate of increases in salaries and other compensation, which is estimated depending on inflation and the length of service of employees within the group. Employee turnover, mortality and disability rates were estimated on the basis of statistical data.

The present value of pension obligations changed as follows in the financial year 2017:

Change in present value of pension obligations

in € million	2017	2016
Defined benefit obligation at January 1	**911.2**	**826.1**
Current service cost	17.4	17.1
Contributions for pension plan subscribers	7.8	8.9
Interest cost	12.4	16.8
Translation differences / transfers	–1.6	1.6
Actuarial gains (-) / losses (+)		
Financial assumptions	–21.9	78.0
Assumptions based on experience	8.4	2.0
Plan settlements / transfers	–13.7	–13.7
Pension benefit and capital payments	–21.8	–25.6
Defined benefit obligation at December 31	**898.2**	**911.2**

The actuarial losses arising from updated assumptions based on experience relate in particular to the empirical behavior of beneficiaries of the company pension scheme when choosing the mode of payment.

The obligations resulting from plan settlements and curtailments are attributable to the group's employee turnover rate and the conversion of pension benefits into fixed-sum payments.

The fair value of plan assets changed as follows in the financial year 2017:

Fair value of plan assets

in € million	2017	2016
Fair value of plan assets at January 1	**27.9**	**25.3**
Interest income on plan assets	0.9	1.0
Actuarial gains / losses (-)	1.8	0.4
Translation differences / transfers	–1.6	1.7
Employer contributions	0.5	0.9
Employee contributions to plan	0.1	0.1
Pension benefit payments	–1.7	–1.5
Fair value of plan assets at December 31	**27.9**	**27.9**

Composition of plan assets

in %	2017	2016
Share investments	50.0	60.0
Fixed-interest securities	50.0	40.0
Total plan assets	**100.0**	**100.0**

Each year, the company's investment strategy for the plan assets is reviewed on the basis of a risk and reward profile for the purpose of asset/liability management and adjusted where necessary. The pension fund's statement of principles defines restrictions to be observed when choosing investments. In this respect, the group has made no changes to its risk management process compared with that used in previous years.

The expense from defined benefit pension plans and similar obligations recognized in the income statement for the relevant reporting period comprises the following items:

Expense from defined benefit pension plans and similar obligations

in € million	2017	2016
Total service cost	**17.4**	**17.1**
Interest cost	12.4	16.8
Interest income on plan assets	–0.9	–1.0
Net interest cost	**11.5**	**15.8**
Interest expense for annuity capital payments (included in liabilities)	**0.9**	**0.5**
Total expense	**29.8**	**33.4**

Current and past service cost are recognized under personnel expenses. The other components of the expense from defined benefit pension plans and similar obligations are recognized in the financial result on other items. Actuarial gains and losses on plan assets and pension obligations are recognized in the statement of comprehensive income as part of other comprehensive income.

Expected future pension benefit payments

The company expects to amortize its pension obligations by the following distribution of pension benefit payments in the coming years:

Expected yearly amount of pension benefit payments

in € million	2018	2019	2020	2021
Expected yearly amount of pension benefit payments	30.6	32.0	35.8	38.6

The expected yearly amount of pension benefit payments is based on the assumption that beneficiaries will choose either the standard option or the initially agreed payment option, which in the case of staff means either receiving their retirement benefits by installment or, in the case of Executive Board members, as a one-time cash settlement or, if available, according to one of the alternative payment options offered at the reporting date.

The main actuarial assumptions used to calculate the defined benefit obligation (DBO) apart from the mode of payment are the discount rate, salary and pension trends, and assumed life expectancy. The following sensitivity analysis shows how the DBO would have been influenced by potential changes in the underlying assumptions:

Sensitivity analysis of the defined benefit obligation

in € million	2017	2016
Discount rate 50 basis points higher	–54.4	–57.6
Discount rate 20 basis points lower	22.0	24.7
Pension trend 50 basis points higher	12.8	14.4
Assumed life expectancy 1 year higher	12.9	13.5

There are interdependencies between certain of the actuarial assumptions, especially between changes in the discount rate and the expected pension and salary trends. The sensitivity analysis does not take these interdependencies into account.

26. Income tax payable

The income tax payable amounting to € 3.6 million at the reporting date (2016: € 6.8 million) comprises German corporation and municipal trade tax plus taxes on the income of group companies outside Germany.

Income tax payable

in € million	2017	2016
Balance at January 1	**6.8**	**31.1**
Utilized	–6.8	–31.1
Allocated	3.6	6.8
Balance at December 31	**3.6**	**6.8**

The income tax liabilities are due for payment within one year.

27. Other provisions

Other provisions

in € million	Total		Non-current		Current	
	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016
Warranty obligations and risks from pending losses on onerous contracts	264.2	199.1	2.9	0.9	261.3	198.2
Personnel obligations	74.4	68.1	7.3	11.6	67.1	56.5
Accrued sales reversals	268.5	211.5			268.5	211.5
Subsequent costs	196.2	147.4	27.4	10.9	168.8	136.5
Other obligations	90.1	81.6			90.1	81.6
Total other provisions	**893.4**	**707.7**	**37.6**	**23.4**	**855.8**	**684.3**

Non-current other provisions developed as follows:

Non-current other provisions 2017

in € million	Balance at Jan. 1, 2017	Transferred	Utilized	Allocated	Discount reversed	Balance at Dec. 31, 2017
Warranty obligations and risks from pending losses on onerous contracts	0.9			2.0		2.9
Personnel obligations	11.6	–8.2		3.8	0.1	7.3
Subsequent costs	10.9		–3.2	19.7		27.4
Total non-current other provisions	**23.4**	**–8.2**	**–3.2**	**25.5**	**0.1**	**37.6**

The following cash outflows are expected from the carrying amounts of non-current other provisions:

Expected cash outflow from non-current other provisions

in € million	Carrying amount Dec. 31, 2017	Expected cash outflow 2019
Personnel obligations	7.3	2.9
Subsequent costs, warranty obligations and risks from pending losses on onerous contracts	30.3	14.8
Total expected cash outflow from non-current other provisions	**37.6**	**17.7**

Expected cash outflow from non-current other provisions

in € million	Carrying amount Dec. 31, 2016	Expected cash outflow 2018
Personnel obligations	11.6	4.9
Subsequent costs, warranty obligations and risks from pending losses on onerous contracts	11.8	5.0
Total expected cash outflow from non-current other provisions	**23.4**	**9.9**

MTU expects that the stated personnel obligations will become due within the next five years. Current other provisions developed as follows.

Current other provisions developed as follows:

Current other provisions 2017

in € million	Balance at Jan. 1, 2017	Transferred	Utilized	Dissolved	Allocated	Translation differences	Balance at Dec. 31, 2017
Warranty obligations and risks from pending losses on onerous contracts	198.2		–38.8	–5.9	107.5	0.3	261.3
Personnel obligations	56.5	8.2	–58.4	–0.4	61.4	–0.2	67.1
Accrued sales reversals	211.5		–65.4	–16.4	139.9	–1.1	268.5
Subsequent costs	136.5		–72.6	–5.4	109.3	1.0	168.8
Other obligations	81.6		–54.8	–5.4	68.2	0.5	90.1
Total current other provisions	**684.3**	**8.2**	**–290.0**	**–33.5**	**486.3**	**0.5**	**855.8**

The cash outflows relating to current other provisions are expected to be realized in the calendar year following the reporting period.

Warranty obligations and risks from pending losses on onerous contracts

The main component of this item of provisions is an amount of € 258.4 million (2016: € 192.1 million) for liabilities associated with warranty obligations in connection with the delivery of goods and services, based on the most recently available technical and market data on these goods and services, and their delivery status.

MTU has furthermore identified onerous contracts in its commercial maintenance business in which the unavoidable costs of fulfilling contractual obligations are higher than the expected inflow of economic benefits from these contracts. A provision of € 5.8 million (2016: € 7.0 million) was recognized to cover the difference. When measuring and recognizing this provision, consideration was given to impairment losses on assets relating to these contracts.

Personnel obligations

The provisions for personnel expenses include provisions for long-service awards amounting to € 4.1 million (2016: € 4.5 million) and provisions for preretirement part-time working arrangements based on the collective agreement on phased retirement and related works agreements. On the basis of these agreements, obligations amounting to € 6.3 million (2016: € 10.6 million) were recognized at December 31, 2017. The obligation takes account of relevant plan assets amounting to € 11.2 million. A further line item is provisions for profit-sharing bonuses, which amounted to € 62.4 million (2016: € 51.6 million). These relate to the short-term incentive (STI) for the Executive Board and the profit-sharing bonus for senior managers and the bonus for employees covered by the collective wage agreement and exempt employees.

Under the terms of the current compensation system, members of the Executive Board and senior managers receive a target direct compensation comprised of fixed and variable components. The variable component consists of short-term and long-term employee benefits.

The long-term portion of the target direct compensation is granted in the form of a cash payment, which must be immediately re-invested in MTU shares. These shares are subject to a specific vesting period, defined according to the beneficiary's rank in the management hierarchy. The amount of target direct compensation granted for the purchase of shares also depends on the performance targets achieved at corporate level during the three financial years preceding the grant date.

The short-term portion of the target direct compensation is based on the goal achievement level in respect of the group KPIs EBIT adjusted and free cash flow, and a component reflecting the employee's personal performance in the reporting year.

Detailed explanatory comments on the compensation system for members of the Executive Board are provided in the management compensation report which forms part of the corporate governance report.

Accrued sales reversals

Accrued sales reversals relate to retrospective adjustments to contractual prices agreed with customers. The increase in the reporting period is consistent with the revenues realized from spare parts sales, which due to accounting factors are regularly subject to retrospective price adjustments in the context of MTU's partnerships in commercial engine programs. The amount recognized in this item corresponds to the outstanding portion of such price adjustments at the reporting date.

Subsequent costs

Subsequent costs comprise amounts of cost of sales recognized in respect of outstanding payments, especially to suppliers and service providers, arising from particular contracts with customers. The rise in the carrying amount of this provision is mainly attributable to revenue growth in the reporting period.

Other obligations

Provisions for other obligations principally cover obligations recognized as a result of joint liability for interruptions in performance, especially in the context of commercial engine programs in which MTU is a partner (risk- and revenue-sharing). This item also includes a multitude of obligations which, considered individually, are judged to be of immaterial importance.

28. Financial liabilities

Financial liabilities

	Total		Non-current		Current	
in € million	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016
Bonds and notes	100.0	353.6	98.0	97.9	2.0	255.7
Convertible bond	478.5	474.6	478.1	474.2	0.4	0.4
Financial liabilities arising from increased or new stakes in engine programs	370.5	492.0	272.9	369.8	97.6	122.2
Financial liabilities to banks						
Note purchase agreement	30.1	30.1	30.0	30.0	0.1	0.1
Revolving credit facility	77.9				77.9	
Other liabilities to banks	0.2				0.2	
Loans from third parties	18.2				18.2	
Finance lease liabilities	11.5	11.6	10.0	10.2	1.5	1.4
Total gross financial debt	**1,086.9**	**1,361.9**	**889.0**	**982.1**	**197.9**	**379.8**
Derivatives without hedging relationship	0.9	29.7	0.9	0.2		29.5
Derivatives with hedging relationship	0.1	86.4		25.8	0.1	60.6
Personnel-related financial liabilities	48.8	37.7	31.2	24.3	17.6	13.4
Repayment of grants toward development costs	22.2	30.5	13.6	21.3	8.6	9.2
Sundry other financial liabilities	77.6	155.4	1.9	2.7	75.7	152.7
Total other financial liabilities	**149.6**	**339.7**	**47.6**	**74.3**	**102.0**	**265.4**
Total financial liabilities	**1,236.5**	**1,701.6**	**936.6**	**1,056.4**	**299.9**	**645.2**

Gross financial debt

Bonds and notes

In order to finance the purchase price components of the increase in the company's share in the IAE-V2500 engine program, MTU Aero Engines AG, Munich, issued a bond for a nominal amount of € 250.0 million with effect from June 21, 2012. The bond earned an annual rate of interest of 3.0% from the date of issue (June 21, 2012) until the repayment date (June 21, 2017). The bond, including transaction costs and a discount of € 1.5 million, was recognized at amortized cost and was repaid on schedule.

MTU Aero Engines AG issued a registered bond on June 12, 2013 for a total nominal amount of € 100.0 million. The registered bond is repayable on June 12, 2028, and is subject to interest of 3.55% p.a. Interest is payable in arrears on June 12 of each year, for the first time on June 12, 2014. The registered bond, including transaction costs and a discount of € 2.7 million, was recognized at amortized cost.

The following rules apply in the event of a change of control: every bondholder is entitled to declare due part or all of his/her bond units for the nominal amount plus any accrued interest. This does not apply if the issuer has already called in the bond. A change-of-control event occurs if the rating is lowered in the course of the change of control.

A lowering of the rating occurs if (1) during the change-of-control period a rating previously granted by a rating agency to MTU or to one of its outstanding non-current liabilities is withdrawn or is changed from an investment grade rating (equivalent to or higher than Baa3 (Moody's) or BBB- (Fitch or S&P), or if (2) at the time of the change of control, no investment grade rating has been awarded by a rating agency to the bond or to MTU and no rating agency awards an investment grade rating to the bond within the change-of-control period.

Convertible bond

In 2016, MTU Aero Engines AG issued a convertible bond in the form of a preferential unsecured debenture, for a total nominal amount of € 500.0 million. This bond is convertible into registered non-par-value shares in MTU.

The convertible bond has an original maturity of 7 years and is divided into units of € 100,000. It bears an interest rate of 0.125% per annum, payable annually in arrears.

Bondholders have been entitled to convert their certificates into common shares of MTU Aero Engines AG since June 27, 2016. The initial conversion price was set at € 124.7701 which represents a premium of 50% above the reference rate.

MTU has the right to recall the issued bond units at their nominal value (plus accrued unpaid interest), in accordance with the conditions of issue, at any time on or after June 16, 2020, either (i) if the quoted price of the common share rises to or above 130% of the applicable conversion price or (ii) if no more than 20% of the nominal value of the convertible bond issue is outstanding.

Financial liabilities arising from increased or new stakes in engine programs

These items include the deferred purchase price components arising from the IAE-V2500 stake increase and the acquisition of stakes in new engine programs. The latter are referred to in the following as financial liabilities arising from other program participations.

Financial liability arising from IAE-V2500 stake increase

The agreement signed by MTU in the financial year 2012 in order to increase its share in the V2500 engine program by five percentage points to 16% included a deferred purchase price component contingent upon the number of flight hours performed over the next 15 years by the V2500 engine fleet in service at time of the stake increase.

Financial liabilities arising from other program participations

The financial liabilities arising from other program participations mainly relate to outstanding program entry payments for the PW1000G family, the PW800 as well as the GE cooperation.

Financial liabilities to banks

Note purchase agreement

MTU Aero Engines AG issued a note purchase agreement on March 28, 2014 for a total nominal amount of € 30.0 million and with a maturity date of March 27, 2021. The note purchase agreement has a variable interest rate corresponding to the 6-month Euribor rate plus a percentage margin. The initial interest rate amounts to 1.72%. The interest is calculated and paid twice a year, in March and September.

Revolving credit facility

The company has access to a revolving credit facility of € 600.0 million with five banks, which runs until October 28, 2022. This facility was renewed for a further year in 2017. Any credit utilized is subject to interest at the customary market reference rates plus an additional margin. Unused credit facilities are subject to a loan commitment fee. An amount of € 90.6 million, € 12.7 million of which for guarantees in favor of third parties had been drawn down under this facility at December 31, 2017 (2016: € 13.8 million solely in the form of guarantees in favor of third parties).

MTU has undertaken to ensure that certain financial indicators remain within defined boundaries throughout the respective terms of the revolving credit facility as follows: MTU's debt-equity ratio (consolidated net financial debt in relation to EBIT adjusted-DA) at the end of each quarter shall not exceed 3.0; the times interest earned ratio (EBIT adjustedDA in relation to the consolidated net interest expense) at the end of each quarter shall not fall below 4.0.

Loans from third parties

Loans from third parties relate to credit facitlities granted in 2017 in respect of long-term maintenance contracts in the commercial maintenance segment that are repayable at the end of the maturity period.

Finance lease liabilities

Finance lease liabilities represent obligations under finance lease arrangements that are capitalized and amortized using the effective interest rate method; for more details, see Note 15 (Property, plant and equipment).

Changes in gross financial debt are shown in the following table:

Changes in gross financial debt

in € million	Balance at Jan. 1, 2017	Incoming / outgoing payments	Non-cash items: Addition	Non-cash items: Disount reversed	Non-cash items: Trans-ferred	Non-cash items: Currency differenc-es	Balance at Dec. 31, 2017
Long-term bonds and notes	99.8	–3.5		3.7			100.0
Short-term bonds and notes	253.8	–257.5		3.7			0.0
Convertible bond	474.6	–0.6		4.5			478.5
Financial liabilities arising from increased or new stakes in engine programs	492.0	–80.8	7.2	14.8	–8.1	–54.6	370.5
Financial liabilities to banks							
Note purchase agreement	30.1	–0.3		0.3			30.1
Revolving credit facility	0.0	77.9					77.9
Other liabilities to banks	0.0	0.2					0.2
Loans from third parties			18.2	0.3		–0.3	18.2
Finance lease liabilities	11.6	–1.4	1.3				11.5
Total gross financial debt	**1,361.9**	**–266.0**	**26.7**	**27.3**	**–8.1**	**–54.9**	**1,086.9**

Other financial liabilities

Liabilities arising out of derivatives

The drop in financial liabilities arising out of derivatives to € 1.0 million (2016: € 116.1 million) is accounted for by the cancelation of items that had become due and an increase in the fair value of forward foreign exchange contracts.

Personnel-related financial liabilities

Personnel-related financial liabilities amounting to € 48.8 million (2016: € 37.7 million) mainly result from claims for one-time and instalment payments under the company pension scheme amounting to € 34.9 million (2016: € 26.0 million). In addition, obligations under the MAP employee stock program of € 7.5 million (2016: € 6.0 million), which the Executive Board of MTU Aero Engines AG, Munich, offered again in the financial year 2017, are also carried here. Under this program, MTU offers all eligible employees covered by the collective wage agreement, exempt employees and senior management the opportunity to invest in MTU shares. At the end of a two-year vesting period, employees covered by the collective wage agreement and exempt employees receive a taxable “matching” payment corresponding to 50 % of the amount invested by the employee in MTU shares at the beginning of the program. Members of senior management receive a taxable “matching” payment at the end of the two-year vesting period corresponding to one third of the amount individually invested.

The number of shares sold to group employees under the terms of the MAP employee stock program in the financial years 2017 and 2016 was as follows:

MAP employee stock program

Issue date	Number of shares sold	Average cost of acquisition in € million	Total proceeds of sale in € million	Selling price per share in €
June 2017	113,213	1.7	14.3	126.14
June 2016	177,086	3.6	14.5	82.26

The total expense for the issue of matching shares in connection with the MAP employee stock program in the financial year 2017 amounted to € 5.8 million (2016: € 4.8 million).

The purchase price for the MTU shares allocated in the financial year 2017 amounted to € 126.14 per share. The shares transferred to the employees, measured at the average acquisition cost, were removed from the equity item “treasury shares”. The difference of € 12.6 million (2016: € 10.9 million) between the proceeds of the sale and the original acquisition cost was allocated to capital reserves.

Repayment of grants toward development costs

In the financial years from 1976 through 1991, MTU received grants from the German Federal Ministry of Economics and Technology toward the development costs of the PW2000 engine program. Once the sales figures of PW2000 production engines for the Boeing 757 and C-17 as set down in the grant notice have been reached, MTU is obliged to reimburse the full sum of the grants received within a timeframe of ten years. In the financial years 2011 through 2016 a total amount of € 34.3 million was repaid and in 2017 a further € 9.4 million.

Sundry other financial obligations

The sundry other financial obligations totaling € 77.6 million (2016: € 155.4 million) relate principally to obligations arising from externally acquired development services for the PW1000G family and PW800 engine programs.

29. Trade payables

Trade payables

in € million	Dec. 31, 2017	Dec. 31, 2016
Accounts payable to:		
Third parties	448.6	578.5
Related companies	114.2	56.4
Total trade payables	**562.8**	**634.9**

Trade payables include open purchase invoices and amounts payable for purchased goods and services.

The total amount of trade payables is due within one year.

30. Construction contract and service business payables

Construction contract and service business payables represent the excess amount after advance payments received have been offset against the corresponding receivables, measured using the percentage-of-completion method.

Construction contract and service business payables

in € million	Dec. 31, 2017	Dec. 31, 2016
Advance payments received for construction contracts	283.2	329.4
Amount of above offset against construction contract receivables	–142.7	–206.8
Advance payments received for service business	181.4	221.6
Total construction contract and service business payables	**321.9**	**344.2**

The stated amounts for advance payments received relate to deliveries of military engine modules, and to the provision of engine maintenance services.

31. Other liabilities

Other liabilities

in € million	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016
Personnel-related liabilities						
Social security	0.6	1.6			0.6	1.6
Other personnel-related liabilities	33.3	30.2			33.3	30.2
Other tax liabilities	30.2	8.5			30.2	8.5
Sundry other liabilities	19.3	1.8	16.9		2.4	1.8
Total other liabilities	**83.4**	**42.1**	**16.9**		**66.5**	**42.1**

Personnel-related liabilities

Personnel-related liabilities in particular concern vacation entitlements and flex-time credits.

Other tax liabilities

The other tax liabilities concern payable wage and church taxes, solidarity surcharges, and transactional taxes.

32. Additional disclosures relating to financial instruments

Carrying amounts, measurement/recognition methods and fair value aggregated by category

In the following tables, the carrying amounts of financial instruments are aggregated by category, irrespective of whether or not the instruments fall within the scope of IFRS 7 or IAS 39. The information presented also includes separate amounts for each category as a function of the measurement/recognition method applied. Finally, the carrying amounts are set opposite the fair values for comparison.

Disclosures relating to financial instruments
Carrying amounts, measurement/ recognition methods and fair values aggregated by category 2017

in € million	Category as defined in IAS 39 / other categories	Carrying amount Dec. 31, 2017
ASSETS		
Other assets		
Loans, receivables, other financial assets	LaR	190.2
Available-for-sale financial assets	AfS	3.4
Trade receivables	LaR	736.9
Construction contract and service business receivables	LaR	454.0
Derivative financial assets		
Derivatives without hedging relationship	FAHfT	1.8
Derivatives with hedging relationship	n.a.	85.6
Cash and cash equivalents	LaR	106.1
EQUITY AND LIABILITIES		
Trade payables	FLAC	562.8
Financial liabilities		
Bonds and notes	FLAC	100.0
Convertible bond	FLAC	478.5
Financial liabilities arising from increased or new stakes in engine programs	FLAC	370.5
Financial liabilities to banks	FLAC	108.2
Loans from third parties	FLAC	18.2
Finance lease liabilities	n.a.	11.5
Derivative financial liabilities		
Derivatives without hedging relationship	FLHfT	0.9
Derivatives with hedging relationship	n.a.	0.1
Sundry other financial liabilities	FLAC / n.a.	148.6
Thereof aggregated by category as defined in IAS 39		
Loans and receivables	LaR	1,487.2
Available-for-sale financial assets	AfS	3.4
Financial assets held for trading	FAHfT	1.8
Financial liabilities measured at amortized cost	FLAC / n.a.	1,786.8
Financial liabilities held for trading	FLHfT	0.9

Abbreviations:
LaR = Loans and Receivables
HtM = Held-to-Maturity
AfS = Available-for-Sale Financial Assets

FAHfT = Financial Assets Held for Trading
FLAC = Financial Liabilities Measured at Amortized Cost
FLHfT = Financial Liabilities Held for Trading
FLtPL = Financial Liabilities Measured at Fair Value through Profit or Loss

Amount carried in balance sheet in accordance with IAS 39				Amount carried in balance sheet IAS 17	Financial instruments not within the scope of IAS 39 or IFRS 7	Total	**Fair value Dec. 31, 2017**
Measured at amortized cost	Measured at cost	Fair value recognized in equity	Fair value recognized in income statement				
187.2					3.0	190.2	190.2
	3.4					3.4	3.4
736.9						736.9	736.9
454.0						454.0	454.0
			1.8			1.8	1.8
		85.6				85.6	85.6
106.1						106.1	106.1
562.8						562.8	562.8
100.0						100.0	121.6
478.5						478.5	675.4
370.5						370.5	374.7
108.2						108.2	108.2
18.2						18.2	18.2
				11.5		11.5	11.5
			0.9			0.9	0.9
		0.1				0.1	0.1
99.8					48.8	148.6	149.9
1,484.2					3.0	1,487.2	1,487.2
	3.4					3.4	3.4
			1.8			1.8	1.8
1,738.0					48.8	1,786.8	2,010.8
			0.9			0.9	0.9

Financial instruments not within the scope of IFRS 7 or IAS 39 comprise liabilities arising from employee benefits and the corresponding plan assets accounted for in accordance with IAS 19.

The table below provides comparative information on the carrying amounts, measurement/recognition methods and fair values aggregated by category for the financial year 2016:

Disclosures relating to financial instruments
Carrying amounts, measurement/ recognition methods and fair values aggregated by category 2016

in € million	Category as defined in IAS 39 / other categories	Carrying amount Dec. 31, 2016
ASSETS		
Other financial assets		
Loans, receivables, other financial assets	LaR	144.3
Available-for-sale financial assets	AfS	28.4
Trade receivables	LaR	692.1
Construction contract and service business receivables	LaR	393.2
Derivative financial assets		
Derivatives without hedging relationship	FAHfT	
Derivatives with hedging relationship	n.a.	0.4
Cash and cash equivalents	LaR	322.4
EQUITY AND LIABILITIES		
Trade payables	FLAC	634.9
Financial liabilities		
Bonds and notes	FLAC	353.6
Convertible bond	FLAC	474.6
Financial liabilities arising from increased or new stakes in engine programs	FLAC	492.0
Financial liabilities to banks	FLAC	30.1
Finance lease liabilities	n.a.	11.6
Derivative financial liabilities		
Derivatives without hedging relationship	FLHfT	29.7
Derivatives with hedging relationship	n.a.	86.4
Sundry other financial liabilities	FLAC / n.a.	223.6
Thereof aggregated by category as defined in IAS 39		
Loans and receivables	LaR	1,552.0
Available-for-sale financial assets	AfS	28.4
Financial assets held for trading	FAHfT	
Financial liabilities measured at amortized cost	FLAC / n.a.	2,208.8
Financial liabilities held for trading	FLHfT	29.7

Abbreviations:
LaR = Loans and Receivables
HtM = Held-to-Maturity
AfS = Available-for-Sale Financial Assets
FAHfT = Financial Assets Held for Trading
FLAC = Financial Liabilities Measured at Amortized Cost
FLHfT = Financial Liabilities Held for Trading
FLtPL = Financial Liabilities Measured at Fair Value through Profit or Loss

Amount carried in balance sheet in accordance with IAS 39				Amount carried in balance sheet IAS 17	Financial instruments not within the scope of IAS 39 or IFRS 7	Total	Fair value Dec. 31, 2016
Measured at amortized cost	Measured at cost	Fair value recognized in equity	Fair value recognized in income statement				
143.6					0.7	144.3	144.3
	3.4	25.0				28.4	28.4
692.1						692.1	692.1
393.2						393.2	393.2
		0.4				0.4	0.4
322.4						322.4	322.4
634.9						634.9	634.9
353.6						353.6	356.9
474.6						474.6	565.8
492.0						492.0	495.1
30.1						30.1	30.1
				11.6		11.6	11.6
			29.7			29.7	29.7
		86.4				86.4	86.4
185.9					37.7	223.6	225.9
1,551.3					0.7	1,552.0	1,552.0
	3.4	25.0				28.4	28.4
2,171.1					37.7	2,208.8	2,308.7
			29.7			29.7	29.7

Cash and cash equivalents, trade receivables, other receivables as well as trade payables and other payables are generally due within a relatively short time. The carrying amounts of these assets therefore correspond approximately to their fair value at the reporting date.

With the exception of the convertible bond, which is traded on the stock market and therefore allocated to level 1 of the fair-value hierarchy, all other financial instruments are allocated to level 2. The fair value of these assets, which differs from the carrying amount in these cases, is determined using the discounted cash flow method.

Classification of fair-value measurements of financial assets and liabilities according to the fair-value hierarchy

In order to evaluate the relevance of the parameters used when estimating financial assets and liabilities at their fair value, MTU assigns these assets and liabilities to three levels of a fair-value hierarchy.

The three levels of the fair-value hierarchy are described below, together with their utilization when measuring financial assets and liabilities:

Level 1 Quoted prices in active markets for identical assets or liabilities (unadjusted input);

Level 2 Prices of assets or liabilities that can be observed directly or indirectly (derived);

Level 3 Unobservable inputs used to measure prices of assets or liabilities.

The following tables show the allocation of financial assets and liabilities measured at fair value to the three levels of the fair-value hierarchy for 2017 and 2016:

Classification within the fair-value hierarchy for the financial year 2017

in € million	Level 1	Level 2	Level 3	Total
Financial assets measured at fair value				
Derivative financial instruments		87.4		87.4
Total financial assets		**87.4**		**87.4**
Financial liabilities measured at fair value				
Derivative financial instruments		1.0		1.0
Total financial liabilities		**1.0**		**1.0**

Classification within the fair-value hierarchy for the financial year 2016

in € million	Level 1	Level 2	Level 3	Total
Financial assets measured at fair value				
Derivative financial instruments		0.4		0.4
Available-for-sale financial assets		25.0		25.0
Total financial assets		**25.4**		**25.4**
Financial liabilities measured at fair value				
Derivative financial instruments		116.1		116.1
Total financial liabilities		**116.1**		**116.1**

The fair value of the derivative financial instruments and securities assigned to level 2 is measured using the discounted cash flow (DCF) method. In the previous year, the fair value of available-for-sale financial assets corresponded approximatively to their nominal value, due to the interest rate conditions and creditworthiness of the respective contractual partners.

Payment cash flows for financial liabilities

The following tables list the contractually agreed payments of interest and principal on the financial liabilities measured at fair value through profit of loss at the reporting date.

Payment cash flows for financial liabilities 2017

		Cash flow 2018			Cash flow 2019			Cash flow 2020			Cash flow 2021 ff		
in € million	Carrying amount Dec. 31, 2017	Fixed interest	Variable interest	Principal	Fixed interest	Variable interest	Principal	Fixed interest	Variable interest	Principal	Fixed interest	Variable interest	Principal
Trade payables	562.8			562.8									
Bonds and notes	100.0	3.6			3.6			3.6			28.3		100.0
Convertible bond	478.5	0.6			0.6			0.6			1.9		500.0
Financial liabilities arising from increased or new stakes in engine programs	370.5			97.6			50.6			48.5			219.0
Financial liabilities to banks	108.2		0.3	78.1		0.3			0.3			0.2	30.0
Loans from third parties	18.2	0.7		17.9									
Finance lease liabilities	11.5	0.3		1.5	0.3		1.6	0.3		1.7	2.3		6.7
Derivative financial liabilities													
Derivatives without hedging relationship	0.9						0.9						
Derivatives with hedging relationship	0.1			0.1									
Sundry other financial liabilities	148.6			101.9			15.7			12.4			25.1

Payment cash flows for financial liabilities 2016

		Cash flow 2017			Cash flow 2018			Cash flow 2019			Cash flow 2020 ff		
in € million	Carrying amount Dec. 31, 2016	Fixed interest	Variable interest	Principal	Fixed interest	Variable interest	Principal	Fixed interest	Variable interest	Principal	Fixed interest	Variable interest	Principal
Trade payables	634.9			634.9									
Bonds and notes	353.6	11.0		250.0	3.6			3.6			31.9		100.0
Convertible bond	474.6	0.6			0.6			0.6			2.5		500.0
Financial liabilities arising from increased or new stakes in engine programs	492.0			122.2			78.2			56.5			299.1
Financial liabilities to banks	30.1		0.3			0.3			0.4			0.5	30.0
Finance lease liabilities	11.6	0.3		1.4	0.3		1.5	0.3		1.3	2.4		7.4
Derivative financial liabilities													
Derivatives without hedging relationship	29.7			29.5			0.1			0.1			
Derivatives with hedging relationship	86.4			60.6			22.5			3.3			
Sundry other financial liabilities	223.6			175.3			15.4			12.3			27.2

The statement includes all instruments in the portfolio at December 31, 2017 for which payment terms had been contractually agreed. Amounts denominated in a foreign currency are translated at the exchange rate prevailing on the respective reporting date. The variable-rate interest payments on the financial instruments are based on the most recent interest rate fixed prior to December 31, 2017. Financial liabilities with no fixed repayment date are always assigned to cash flows on the basis of the earliest likely repayment dates.

Within the scope of its partnerships in engine programs, MTU is a party to aircraft financing agreements for the purpose of promoting sales. Such loan commitments are only ever entered into jointly with other partners in the engine consortium, in particular the consortium leader (OEM). They are provided in two basic forms: predelivery payment (PDP) and backstop commitments. In both cases, any funds made available to the aircraft purchaser are always transferred directly to the aircraft manufacturer by the consortium leader (OEM).

MTU classifies loan commitments offered up to the reporting date totaling a nominal amount, translated into euros, of € 535.8 million (2016: € 387.5 million) as part of its gross risk in accordance with the requirements of IFRS 7. However, based on experience, it is considered to be very unlikely that these notional loan amounts will actually be utilized to their full extent.

The agreed conditions of the loan are linked to market conditions applicable when the loan is utilized and in the case of backstop commitments are cost-prohibitive. In the case of PDP financing, the consortium has collateral rights to the aircraft while it is still in production and thus in the possession of the aircraft manufacturer – in the case of backstop commitments, the consortium retains direct ownership of the asset up to the delivery date. After delivery the lender retains a security interest in the aircraft. MTU also assumes that other lenders will become third parties to any loans that are established, particularly in consideration of the offered financing terms. Another factor that will tend to limit credit risks is the incorporation of supplementary restrictive clauses in the proposed agreements, which require the aircraft purchaser to provide evidence that their financial means are sufficient before the loan contract is signed.

With respect to the impact on MTU's liquidity of the notional loan amounts of the proposed financing agreements, the company makes sure that its lines of credit (see Note 28) provide adequate liquidity reserves, even in the unlikely case that all offers of financing agreements are taken up at the same time, and bears in mind the possibility of extending these lines of credit in order to back up additional offers. In the event that loan commitments are utilized, MTU considers the associated liquidity and credit risks to be manageable.

Explanatory comments relating to net gain/loss on financial instruments by category

The tables below show the gains/losses arising from transactions involving financial instruments, aggregated by category, for 2017 and 2016. Interest income and expense in connection with financial assets and liabilities that are measured at fair value through profit or loss are not included here:

Net gain/loss on financial instruments by category 2017

Aggregated by category as defined in IAS 39	from interest	from investments	from remeasurement			from disposal	Net gain / loss 2017
in € million			at fair value through profit or loss	currency translation	valuation allowances		
Loans and receivables (LaR)	6.1			–112.5	2.4		–104.0
Available-for-sale financial assets (AfS)		1.5					1.5
Financial assets held for trading (FAHfT)			30.2				30.2
Financial liabilities measured at amortized cost (FLAC)	–13.0		–15.9	116.7			87.8
Financial liabilities held for trading (FLHfT)			–22.3				–22.3
Financial instruments not within the scope of IFRS 7 or IAS 39		42.4		–5.4			37.0
Total	**–6.9**	**43.9**	**–8.0**	**–1.2**	**2.4**		**30.2**

Net gain/loss on financial instruments by category 2016

Aggregated by category as defined in IAS 39	from interest	from investments	from remeasurement			from disposal	Net gain / loss 2016
in € million			at fair value through profit or loss	currency translation	valuation allowances		
Loans and receivables (LaR)	2.6			24.1	–10.8		15.9
Available-for-sale financial assets (AfS)	2.2	2.7					4.9
Financial assets held for trading (FAHfT)			39.4				39.4
Financial liabilities measured at amortized cost (FLAC)	–12.8		–17.9	–36.7			–67.4
Financial liabilities held for trading (FLHfT)			–31.9			–0.1	–32.0
Financial instruments not within the scope of IFRS 7 or IAS 39		28.6		–3.4			25.2
Total	**–8.0**	**31.3**	**–10.4**	**–16.0**	**–10.8**	**–0.1**	**–14.0**

The interest component of financial instruments is recognized under net interest expense (see Note 8). Other components of net income or loss are presented in MTU's financial statements in the financial result on other items (see Note 9), with the exception of the expense for valuation allowances on trade receivables, which comes under the category of loans and receivables and is recognized under selling expenses (see Note 4). Moreover, gains / losses arising from translation differences on trade receivables and payables are recognized under revenues (see Note 1) or cost of sales (see Note 2) respectively.

Explanatory comments relating to net interest expense
The net interest expense on financial liabilities classified as "financial liabilities measured at amortized cost" mainly comprises interest expenses amounting to € 13.0 million (2016: € 12.8 million) associated with corporate bonds, loan agreements with banks, and finance lease liabilities.

Explanatory comments relating to measurement subsequent to initial recognition
The net gain/loss on financial instruments measured at fair value mainly comprises exchange rate gains and losses arising from the measurement of derivatives without hedging relationship. The amount stated for "financial liabilities measured at amortized cost" mainly results from changes in the discount rate applied when measuring this category of financial instruments.

Losses amounting to € 112.5 million (2016: gains amounting to € 24.1 million) from the currency translation of financial assets classified as "loans and receivables" are mainly attributable to the measurement of trade receivables. These losses are offset principally by currency translation gains amounting to € 116.7 million (2016: losses amounting to € 36.7 million) on trade payables, which are classified as "financial liabilities measured at amortized cost".

33. Deferred tax assets and liabilities

Deferred tax assets and liabilities arise on temporary differences between the tax bases of assets and liabilities of the group companies and their carrying amounts in the consolidated balance sheet. Deferred tax assets were also recognized for tax credits and losses available for carry-forward. Deferred tax assets and liabilities were recognized in OCI in connection with the subsequent measurement of pension obligations and the corresponding plan assets and in connection with the fair-value measurement of derivative financial instruments for which an effective hedging relationship was established, and in respect of the difference between the fair value and carrying amount of the equity component of the convertible bond.

Changes in deferred tax assets and liabilities

in € million	Dec. 31, 2017 Deferred tax assets	Dec. 31, 2017 Deferred tax liabilities	Dec. 31, 2016 Deferred tax assets	Dec. 31, 2016 Deferred tax liabilities	2017 Tax income / expense (-) in total comprehensive income	2017 OCI
	in the balance sheet		in the balance sheet			
Assets						
Intangible assets		254.4	0.1	248.8	–1.4	–4.3
Property, plant and equipment	6.1	48.9	5.1	47.8	–0.4	0.3
Financial assets	1.5	1.1		3.8	4.2	
Inventories	5.5		4.2	1.1	2.6	–0.2
Receivables and other assets	3.4		1.1	3.7	6.1	–0.1
Total assets	**16.5**	**304.4**	**10.5**	**305.2**	**11.1**	**–4.3**
Equity						
Balance of hedging instrument assets and liabilities		24.5	34.0			–58.5
Equity portion of convertible bond		7.7		7.7		
Actuarial gains and losses on plan assets and pension obligations	116.0		122.3			–6.3
Total equity	**116.0**	**32.2**	**156.3**	**7.7**		**–64.8**
Liabilities						
Pension provisions	0.3	1.7	1.9	1.8	–1.6	0.1
Other provisions	23.1	0.1	33.8	0.3	–10.2	–0.3
Liabilities	127.5		138.5	0.7	–13.1	2.8
Total liabilities	**150.9**	**1.8**	**174.2**	**2.8**	**–24.9**	**2.6**
Deferred taxes on assets and liabilities	**283.4**	**338.4**	**341.0**	**315.7**	**–13.8**	**–66.5**
Tax credits and tax losses available for carry-forward						
Tax credits available for carry-forward	33.0		26.9		4.7	1.4
Tax losses available for carry-forward	21.7		25.3		–4.5	0.9
Valuation allowances and unrecognized recoverable tax payments						
Valuation allowances on tax credits carried forward	–11.3		–8.9		–1.9	–0.5
Valuation allowances on tax losses carried forward	–7.1		–13.9		7.2	–0.4
Temporary differences for which no deferred tax assets were recognized	–13.5		–21.6		9.2	–1.1
Total tax credits and losses carried forward	**22.8**		**7.8**		**14.7**	**0.3**
Deferred taxes / liabilities before offset	**306.2**	**338.4**	**348.8**	**315.7**	**0.9**	**–66.2**
Offset	–251.0	–251.0	–292.2	–292.2		
Net deferred tax assets / liabilities	**55.2**	**87.4**	**56.6**	**23.5**	**0.9**	**–66.2**

Reference is made to Note 10 (Income taxes) for further information relating to current and deferred tax assets and liabilities resulting from the balance sheet and other items listed above and to the reconciliation between expected and recognized tax expense.

Tax assets and liabilities are offset against one another only if they relate to the same type of tax levied by the same tax jurisdiction, and are due within the same period.

Deferred tax assets were recognized for deferred tax losses / credits available for carry-forward in the case of the following group companies:

Deferred tax assets recognized for tax losses/credits available for carry-forward at December 31

in € million	U.S. 2017	Poland 2017	Total 2017	Total 2016
Tax credits available for carry-forward	1.1	31.9	33.0	26.9
Tax losses available for carry-forward	2.4	19.3	21.7	25.3
Potential tax impact of tax losses / credits available for carry-forward	**3.5**	**51.2**	**54.7**	**52.2**
Valuation allowance on tax credits carried forward		–11.3	–11.3	–8.9
Valuation allowance on tax losses carried forward	–1.9	–5.2	–7.1	–13.9
Deferred tax assets on tax losses / credits available for carry-forward	**1.6**	**34.7**	**36.3**	**29.4**

United States

MTU Aero Engines North America Inc., Rocky Hill, USA, (AENA) and Vericor Power Systems LLC., Alpharetta, USA have been a fiscal unit since July 1, 2016. Tax losses in respect of federal tax available for carry-forward at December 31, 2016 amounting to € 0.7 million were utilized in full in the reporting period, so that at the reporting date tax losses were available only in respect of state tax, which after the application of valuation allowances amount, translated into euros, to € 7.8 million (2016: € 10.8 million).

Claims from tax credits continue to be recognized for the tax unit. These mainly result from development activities. Deferred tax assets were similarly recognized in respect of these recoverable tax payments.

Poland

MTU Aero Engines Polska sp. z o.o. receives government support in the context of Poland's economic development program by virtue of its location in a special economic zone. Because its business investments help to create jobs, the company has been awarded tax credits in respect of the taxable profits it expects to achieve through its production activities, with separate amounts being accorded each year through to 2026. Deferred tax assets amounting to € 20.6 million (2016: € 17.0 million) were recognized on the basis of the business investments realized up to the reporting date, taking into account the currently expected earnings from the activities for which tax credits were awarded.

In addition to the activities for which tax advantages are granted, the company also provides services that are subject to normal taxation. In the financial years 2012 through 2016, this area of business resulted in tax losses, while in 2017 taxable profit was generated. These tax losses, which amount to € 101.4 million, can be carried forward for no more than five years and a ceiling is imposed on the amount carried forward each financial year. As a result, it was possible to recognize deferred tax assets amounting to € 14.1 million (2016: € 10.6 million), in view of the currently expected earnings from the relevant activities. A valuation allowance corresponding to the difference between this amount and the maximum allowable amount of deferred tax assets was therefore recognized in the balance sheet.

At the reporting date, there were temporary differences amounting to € 70.8 million (2016: € 113.8 million) for which no deferred tax assets were recognized, in view of the relevant income expectations for the next five years. The resulting potential tax impact of € 13.5 million (2016: € 21.6 million) was therefore not taken into account in the computation of income tax expense.

Deferred tax liabilities for taxable differences arising from investments in subsidiaries and joint ventures

In accordance with IAS 12, no deferred tax liabilities were recognized for temporary differences amounting to € 186.3 million (2016: € 162.0 million) that arose in connection with investments in subsidiaries and joint ventures. If these differences were to lead to the creation of deferred tax liabilities, they would result in a tax liability amounting to € 12.3 million (2016: € 24.4 million), based on the current tax legislation.

IV. Other disclosures

34. Measurement of the recoverable amount of operating segments to which goodwill has been attributed

The group tests the goodwill of its groups of cash-generating units (CGUs) for impairment annually. Goodwill is deemed to be impaired if the carrying amount determined for each CGU exceeds its recoverable amount. At MTU, the identifiable groups of CGUs utilized for the purpose of the goodwill impairment test are its two operating segments – OEM (commercial and military engine business) and MRO (commercial maintenance business).

The value in use of each of the two operating segments at June 30, 2017, was calculated in order to determine their respective recoverable amounts, based on the operational planning data set up in the second half of the fiscal year. In the period between the impairment testing date and the reporting date, no new information came to our knowledge that might significantly affect goodwill measurement.

The calculations of the recoverable amounts are based on the following assumptions: The first step involves the use of models to predict future changes in the engine fleet and the corresponding market share of engines for which MTU holds or expects to hold the responsibility for supplying series-production modules and components, including an estimation of the present and future value of related contracts of present or future significance to its service business, especially in the MRO segment. MTU applies these forecasts systematically as a basis for its capacity planning and corresponding revenue forecasts, from which the planned EBIT and cash flow for each of the two operating segments are derived. The outcome of this process is therefore necessarily based on expectations as regards future market shares, growth in the individual markets, the profitability of products as well as macroeconomic developments such as trends in exchange rates, interest rates and commodity prices. The values in use, and the corresponding carrying amounts, are determined without reference to financing activities.

The payment cash flow on which the value in use of the OEM segment (commercial and military engine business) is based included an average growth rate for revenues within the detailed planning horizon of 5.4% p.a. (2016: 7.3% p.a.), EBITDA margins of between 14.3% and 16.2% (2016: 13.5% – 14.1%), and a discount rate before tax of 8.9% (2016: 8.3%). The corresponding payment cash flow for the MRO segment (commercial maintenance business) is based on an average growth rate for revenues within the detailed planning horizon of 4.3% p.a. (2016: 6.7% p.a.), EBITDA margins of between 10.1% and 11.0% (2016: 11.1% – 12.0%), and a discount rate before tax of 9.2% (2016: 8.4%). The parameters taken into account when determining the value of the perpetuity for the period beyond the 5-year detailed planning horizon, based on an assumed perpetuity growth rate of 1%, were: for the OEM segment, the average of the revenues and EBIT margin used for long-term planning purposes and for the MRO segment, given its shorter business cycles, the revenues and EBIT margin of the last year of the planning period.

When applying the discounted cash flow (DCF) method, the weighted average cost of capital (WACC) before tax for each segment is determined iteratively on the basis of a corresponding after-tax discount rate. This is derived from the cost of equity capital after tax, which is based on a risk-free base interest rate and a risk premium for the company (market risk premium multiplied by the beta coefficient calculated on the basis of a peer group analysis). The cost of debt capital, taken as the average cost of debt capital of the peer-group companies, is also factored into the calculation. Cost of equity and cost of debt capital are weighted according to the average capital structure of the peer-group companies when determining the WACC after tax. In order to determine the weighted average cost of capital (WACC) in the reporting period, MTU used a risk-free base interest rate of 1.25%, a market risk premium of 6.50%, and a beta coefficient of 0.91. The cost of debt capital was 2.21% after tax.

The recognized amount of goodwill in the OEM segment (commercial and military engine business) was unchanged compared with the prior year, at € 304.4 million, and the recognized amount for goodwill in the MRO segment (commercial maintenance business) was € 87.2 million (2016: € 87.8 million). The decrease in the amount of goodwill recognized for the MRO segment is due to the effect of currency translation. The value in use of the OEM segment is € 5,784.7 million, and that of the MRO segment is € 2,271.7 million. The corresponding carrying amounts of the cash-generating units are € 2,723.9 million for the OEM segment and € 834.0 million for the MRO segment. There is therefore no indication that the recognized amounts of goodwill are impaired.

35. Sensitivity analysis of goodwill

Sensitivity analyses were carried out to determine the possible impact that a sustained reduction in planned earnings before interest and tax (EBIT) might have on the goodwill amounts allocated to each of the two operating segments. This analysis included sensitivity factors affecting the calculation of the weighted average cost of capital.

Assuming an unchanged weighted average cost of capital (WACC), the sensitivity analyses concluded that there would be no necessity to recognize an impairment loss on goodwill either in the OEM or MRO operating segment, even in the event of a sustained reduction in EBIT ranging to 30 % below the earnings forecast established by management. This similarly applies in the hypothetical case in which EBIT in both segments remains unchanged while the weighted average cost of capital rises by 30 %.

36. Financial risks

In the course of its ordinary business activities, MTU is exposed to credit risks, liquidity risks, and market risks. The objective of financial risk management is to minimize the risks arising from operating activities and the resulting financing requirements through the use of selected derivative and non-derivative hedging instruments.

Risks in connection with the procurement, financing, and sale of MTU's products and services are described in detail in the combined management report. In order to counter financial risks, MTU has put in place an integrated risk management system, which is monitored by the Supervisory Board. The principles of this system aim at rapidly identifying, analyzing, and communicating risks and taking countermeasures. Market risks, particularly commodity price risks, currency risks, and interest risks, are analyzed in respect of their potential impact on earnings before interest and tax (EBIT) and on the interest result, and managed through the targeted use of derivative financial instruments.

Credit risk

MTU is exposed to credit risks arising from its operating activities in both the OEM and MRO segments. The company strives to minimize these risks by means of an integrated, structured risk management system. Consequently, all financial transactions are embedded in a detailed process environment with a clearly defined separation of functions.

In view of the importance of managing credit risks in the case of engine and aircraft financing agreements, to which MTU is a party in connection with its partnership in engine programs and MRO cooperations, oversight is provided by the central treasury department. More detailed information on engine and aircraft financing agreements is provided in Note 32 (Additional disclosures relating to financial instruments) and in the explanatory comments on risks and opportunities in the combined management report.

Financing transactions in connection with liquidity management, e.g. time deposits or forward foreign exchange contracts, also expose the group to a certain degree of credit risk. MTU's internal guidelines therefore stipulate that such transactions may only be conducted by the central treasury department, and only with partners with a credit rating of at least investment grade.

The maximum credit risk is represented by the carrying amounts of the financial assets recognized in the balance sheet. No material agreements, other than security rights in the context of issued engine and aircraft financing loans, existed at the reporting date that could reduce the maximum credit risk. Nonetheless, MTU is exposed to other, shared liability risks and hence potential additional credit risks as a result of its membership in engine consortia. More details concerning these risks are provided in Note 37 (Contingent liabilities and other financial liabilities).

Market risks

Currency risk

More than 80 % of MTU's revenues are generated in U.S. dollars. Approximately half of this currency risk is offset in the normal course of business by costs invoiced likewise in U.S. dollars. Most other costs are incurred in euros, and to a lesser extent in Canadian dollars and Polish zloty. Changes in currency exchange rates in the unhedged portion of the portfolio have a direct impact on net income and cash flow.

Hedging strategy

MTU uses a hedging model to protect certain portions of its expected net foreign currency surplus in order to minimize the effects of the volatility of the U.S. - dollar exchange rate on the company's net income and cash flow. Translation differences arising from the translation of financial statements of international entities into the group's functional currency are not included here.

Forward foreign exchange contracts and financial instruments designated as cash flow hedges

At December 31, 2017, MTU held forward foreign exchange contracts for a contractual period up to January 2020 to sell a nominal volume of U.S. $ 1,580.0 million (which translates to € 1,317.4 million at the exchange rate prevailing at the reporting date). Changes in the fair value of the forward foreign exchange contracts amounted to a positive equity impact of € 171.5 million in 2017 (2016: € 16.2 million). At December 31, 2016, MTU had hedged cash flows for the financial years 2017–2019 amounting to U.S. $ 1,680.0 million (which translates to € 1,593.8 million at the exchange rate prevailing at December 31, 2016).

The open forward foreign exchange contracts at the reporting date have the following maturities:

Forward foreign exchange contracts

in U.S. $ million	2017	2016
2017		800.0
2018	950.0	650.0
2019	590.0	230.0
2020	40.0	
Total	**1,580.0**	**1,680.0**
Translated into € at the exchange rate prevailing on the reporting date	**1,317.4**	**1,593.8**

The company also holds other financial instruments designated as cash flow hedges covering periods extending to 2027 and representing a nominal amount of U.S. $ 437.9 million (2016: U.S. $ 489.2 million), which translates to € 365.1 million (2016: € 464.1 million) at the exchange rate prevailing at the reporting date.

In the financial year 2017, a gain of € 5.2 million (2016: a loss of € 79.3 million) was realized from transactions involving forward foreign exchange contracts and other financial instruments that formed part of effective cash flow hedging relationships, and recognized under revenues in the income statement. In addition, at the reporting date, fair value gains on forward foreign exchange contracts and other financial instruments designated as cash flow hedges amounting to € 51.7 million, net of deferred taxes (2016: fair value losses amounting to € 99.3 million) were recognized directly in equity.

There were no transactions for which hedging relationships were established in prior periods that are no longer expected to occur.

Currency option transactions

Option transactions entitle (long-position option) or oblige (short-position option) MTU to sell a defined quantity of U.S. dollars at agreed euro exchange rates at a specific time. The risk of financial loss from a long-position option is limited to the premiums that have already been paid. Exercising a short-position option entitles MTU to a premium. Losses can be incurred if the exchange rate at maturity, compared with that agreed when the option is sold, falls at a rate exceeding the amount of premiums received for these options. At December 31, 2017, MTU held long-position options amounting to U.S. $ 20.0 million (2016: U.S. $ 20.0 million) and short-position options in an amount of € 20.0 million (2016: € 40.0 million). As a further element of its hedging strategy, MTU employs derivative financial instruments that do not form part of a hedging relationship as defined by IAS 39:

Currency swaps

During the financial year 2017, U.S. - dollar holdings were sold at the daily rate and repurchased after a short time using a swap. As the selling and purchase prices differ marginally, these swaps are immaterial in terms of risk. The purpose of this transaction was to optimize the hedging of currency risk. At December 31, 2017, a currency swap line was in place covering a total nominal amount of U.S. $ 30.0 million (2016: U.S. $ 53.3 million), with a maturity date of January 2, 2018.

Collective forward transactions

The open forward foreign exchange contracts held at December 31, 2016 in the form of collective forward transactions for a nominal amount of U.S. $80.0 million all had maturity dates in 2017, so that at December 31, 2017 no such transactions existed. Of the impairment provisions amounting to € 25.7 million recognized in the balance sheet under liabilities at December 31, 2016, € 15.6 million was utilized to honor these transactions, and therefore € 10.1 million was recognized in the income statement under financial result on other items.

Exchange rate sensitivity analysis

The sensitivity analysis showing the effects of hypothetical changes in exchange rates on net income and equity is related to the foreign currency holdings included in the respective balance sheet items at the reporting date. In this context, it is assumed that the holding at the reporting date is representative of the whole year.

A significant proportion of trade receivables and payables, and of finance lease liabilities, is invoiced in U.S. dollars, and is thus exposed to exchange rate fluctuations. All other non-derivative financial instruments outside of hedging relationships are already denoted in the functional currency EUR and are hence not included in the exchange rate sensitivity analysis. The equity instruments held by the group are not of a monetary nature, and so consequently do not present a currency risk as defined by IFRS 7.

If it is assumed that the exchange rate of the euro to the U.S. dollar at December 31, 2017, or at the prior year's reporting date had been 10% higher or lower than the actual closing rate, this would have produced the following hypothetical effects on net income and equity:

Exchange rate sensitivity analysis

	2017		2016	
in € million	-10%	+10%	-10%	+10%
Exchange rate sensitivity (€ / U.S. $)				
Closing exchange rate Dec. 31, 2016: 1.1993 (Dec. 31, 2016: 1.0541)	1.08	1.32	0.95	1.16
Net income	**14.3**	**–11.7**	**–21.0**	**15.6**
Equity [1]	**–89.6**	**74.5**	**–129.7**	**112.2**
Thereof: hedge reserve (fair value) [1]	–107.9	92.9	–138.3	119.3

[1] after tax

Interest rate risk

MTU is exposed to interest rate risk principally in the euro zone, and to a lesser extent in Canada, China, Poland, and the United States. MTU's interest rate risks are mainly related to pension obligations and financial liabilities.

Interest rate sensitivity analysis

IFRS 7 requires the presentation of interest rate risk in the form of a sensitivity analysis. This demonstrates the effects of changes in market interest rates on interest payments, interest income and expense, other income statement items, net income, and equity. The interest rate sensitivity analysis is based on the following assumptions:

Changes in the market interest rate of non-derivative financial instruments bearing fixed interest rates have an effect on net income and equity only if these financial instruments are classified as "at fair value through profit or loss" or were so designated at initial recognition. Consequently, all fixed-interest financial instruments measured at amortized cost have no interest-rate-induced effects on net income and equity that must be accounted for.

Changes in the market interest rate of financial instruments that have been designated as hedging instruments for the purposes of a cash flow hedge to reduce exposure to variations in payment due to interest rates have an impact on the hedge reserve in equity and are therefore included in the sensitivity analysis. Consequently, financial instruments that do not form part of a hedging relationship as defined by IAS 39 have an effect on the "financial result on other items" (adjustment of fair value of derivative instruments). These effects are taken into account in the earnings-related sensitivity analysis.

In the financial year 2017, no significant risks were discernable with respect to the financial instruments bearing variable interest rates or financial instruments measured at fair value that were held by MTU at the reporting date.

Price risk

Commodity price risk

The risk of price increases is an inherent feature of the commodity markets. This risk is minimized mainly through commodity sales contracts with appropriate price agreements and only to a small extent through derivative financial instruments for forward commodity sales contracts for nickel.

At December 31, 2017, MTU had concluded forward commodity sales contracts with financial institutions for a volume of 350 metric tons of nickel (2016: 450 metric tons) for the years 2018 to 2020 and contracted fixed prices for nickel between U.S. $9,400 and 11,900 per metric ton (2016: between U.S. $10,200 – 14,300 per metric ton).

If the market price for nickel on the respective due date exceeds the agreed fixed price, MTU will receive a payment for the difference from the bank. In the opposite case, MTU is obligated to compensate the bank. No effective hedging relationship as defined in IAS 39 has been established for these transactions. The fair value change of € 1.0 million (2016: € -0.3 million) arising from these forward commodity sales contracts are recognized in the financial result on other items (see Note 9).

If it is assumed that the market price of forward commodity sales contracts for nickel had been 10% higher or lower, net income would have been € 0.3 million higher or lower, respectively (2016: € 0.3 million).

Liquidity risk

MTU's liquidity risk consists in non-compliance with past-due payment obligations on account of insufficient cash or cash equivalents. In order to ensure the solvency and financial flexibility of MTU at all times, long-term credit lines and liquid funds are held available based on multi-year financial planning and rolling monthly liquidity planning.

MTU has concluded long-term syndicated loans and bilateral credit agreements with a number of banks. The established lines of credit at the reporting date are considered sufficient to meet potential obligations arising from loans granted in connection with sales financing agreements in the years to come. For further details, please see Notes 28 (Financial liabilities) and 32 (Additional disclosures relating to financial instruments).

37. Contingent liabilities and other financial obligations

Contingent liabilities

Proceedings are pending before the tax courts contesting land transfer tax assessments in connection with mergers. In view of these proceedings, processing of the land transfer tax statements in connection with the merger of MTU Aero Engines GmbH into MTU Aero Engines Holding AG has been suspended by the tax authorities. According to current estimates, the ultimate land transfer tax expense could, however, amount to € 15 million. As in 2016, MTU currently does not consider this eventuality to be a material tax risk.

The contingent liabilities with respect to IAE result from MTU's membership of the consortium formed to manage the V2500 engine program, which is constituted as a risk- and revenue-sharing partnership, and hence also include liabilities arising from MTU's indirect share in this program via Pratt & Whitney Aero Engines International GmbH, Lucerne, Switzerland (PWAEI). Bank guarantees amounting to € 12.9 million (2016: € 13.8 million) mainly concern contract performance and customs bonds.

Guarantees and other contingent liabilities relate to investment grants and amount to € 8.3 million (2016 € 8.3 million).

MTU also receives a minor amount in public sector grants and assistance in the form of grants toward research and development activities. The risk of repayment obligations exists until such time as the relevant project has been completed and all the conditions associated with it complied with. At the reporting date, the probability that risks of this kind could materialize was deemed to be very low.

Contingent liabilities

in € million	Dec. 31, 2017	Dec. 31, 2016
Contingent liabilities arising from risk- and revenue-sharing partnerships with:		
IAE International Aero Engines AG	14.7	24.1
Pratt & Whitney Aircraft Company	5.3	2.7
General Electric Company	0.8	0.9
Subtotal	**20.8**	**27.7**
Bank guarantees	12.9	13.8
Guarantees and other contingent liabilities	8.3	8.3
Total contingent liabilities	**42.0**	**49.8**

Other financial obligations

Obligations arising from operating lease arrangements
The rental and lease contracts for buildings, machines, tools, office, and other equipment have terms of one to ten years and in certain cases contain extension and purchase options and/or price adjustment clauses. With regard to rental and lease agreements, payments of € 64.0 million (2016: € 31.8 million) were expensed in the financial year 2017.

The nominal total of future minimum lease payments arising from non-terminable operating lease agreements is as follows (based on due payment dates):

Nominal total of future minimum lease payments

in € million	Dec. 31, 2017	Dec. 31, 2016
Due in less than one year	24.5	19.8
Due in more than one year and less than five years	42.3	31.6
Due in more than five years	4.9	2.9
Total future minimum lease payments	**71.7**	**54.3**

The nominal total of future minimum lease payments amounted to € 71.7 million at December 31, 2017, which is € 17.4 million higher than the previous year's amount of € 54.3 million. This year-on-year increase was mainly attributable to the establishment of a pool of lease engines for MTU Maintenance Lease Services B.V., Amsterdam, the Netherlands, and to the rental extension for office premises at MTU Aero Engines AG, Munich.

The main individual obligations arising from operating lease arrangements are as follows:

- Leasing of engines from MTU Maintenance Lease Services B.V., Amsterdam, Netherlands, under contracts with durations of between 3 months and 8 years, some of which include price adjustment clauses to account for the escalation of use fees. Some of these contracts are based on variable leasing rates, indexed to the 6-month U.S. - dollar LIBOR rate and adjusted accordingly at 6-month intervals. None of these contracts permit an extension of the originally agreed duration, but certain of them do include a purchase option when the leasing term expires.
- Rent for the buildings occupied by MTU Maintenance Canada Ltd., Richmond, Canada, under contracts with durations of between 1 and 5 years. Some of these contracts include price adjustment clauses to account for the escalation of leasing rates. None of these contracts contain renewal or purchase options.
- Rent for a production facility and office premises at MTU Maintenance Hannover GmbH, Hannover, under a contract fixed to December 31, 2020. The obligation arising from this increases to account for the escalation of leasing rates. This contract includes renewal options for an additional total of 6 years.
- Two office buildings leased by MTU Aero Engines North America Inc., Rocky Hill, USA under 6-year contracts are subject to price adjustment clauses to account for the escalation of leasing rates. This contract contains neither renewal nor purchase options.
- Rental payments for offices occupied by MTU Aero Engines AG, Munich, under 15-year lease agreements. These contracts include price adjustment clauses linked to consumer price indices. If the consumer price index rises by more than 10% since the last rent increase, the rental payments are increased accordingly.
- Lease payments for the building at the air base in Erding made available for an undetermined duration as part of a cooperative arrangement with the German air force. This contract contains neither renewal nor purchase options. The annual rent is fixed to the end of 2019.
- Lease payments for industrial trucks under a 5-year contract. This contract does not contain price adjustment clauses, and includes neither renewal nor purchase options.

Future income and expenses arising from sublease agreements
At December 31, 2017, the future minimum income from sublease agreements for office space amounted to € 2.8 million (2016: € 3.4 million). The total future minimum expenses associated with sublease agreements amount to € 1.9 million (2016: € 2.2 million). Payments amounting to € 1.7 million (2016: € 1.5 million) for these sublease agreements were recognized as an expense in the financial year 2017.

Order commitments for financial obligations
At December 31, 2017, order commitments for the purchase of intangible assets amounted to € 5.0 million (2016: € 9.8 million) and order commitments for the purchase of property, plant and equipment amounted to € 65.7 million (2016: € 48.2 million). These financial obligations were thus within normal limits.

38. Relationships with related companies and persons

Related companies

Transactions between group companies and joint ventures or associated companies were, without exception, conducted in the context of their normal business activities and made on terms equivalent to those that prevail in arm's length transactions.

Business transactions between companies included in the consolidated financial statements were eliminated in the course of the preparation of these statements and are therefore not disclosed separately in these Notes.

Business with related companies
During the course of the financial year, intra-group transactions involving the supply of goods and services were conducted by group companies as part of their normal operating activities (e.g. development, repairs, assembly, and IT support). The current receivables and liabilities that represent the outstanding balance of business transactions carried out with non-consolidated related companies in the financial years 2017 and 2016 are presented in the following tables:

Accounts receivable from related companies

in € million	Outstanding balance Receivables		Value of business transactions Revenues / income / sales		Expenses / purchases	
	Dec. 31, 2017	Dec. 31, 2016	2017	2016	2017	2016
EUROJET Turbo GmbH, Hallbergmoos	15.6	5.8	138.3	183.8	–1.2	–10.9
EPI Europrop International GmbH, Munich	38.9	36.3	85.9	127.3	–5.7	–5.6
International Aero Engines LLC, East Hartford, Connecticut, USA	117.6	46.9	423.5	168.8	–373.7	–76.3
MTU Turbomeca Rolls-Royce ITP GmbH, Hallbergmoos	0.1	1.2	14.4	16.9	–0.9	–0.7
MTU Turbomeca Rolls-Royce GmbH, Hallbergmoos	0.2		3.9		–0.6	
Pratt & Whitney Canada Customer Service Centre Europe GmbH, Ludwigsfelde	6.1	8.9	60.7	58.9	–0.1	–2.9
Ceramic Coating Center S.A.S., Paris, France	0.2	0.1			–1.8	–2.1
Turbo Union Ltd., Bristol, England	16.6	16.7	62.9	80.3		
Middle East Propulsion Company Ltd., Riyadh, Saudi Arabia[1]				1.2		–1.6
Gesellschaft zur Entsorgung von Sondermüll in Bayern GmbH, Munich					–0.2	–0.2
Sumisho Aero Engines Lease B.V., Amsterdam, Netherlands	1.4	0.7	0.9	0.6	–5.5	–2.2
MTU Maintenance Service Centre Australia Pty. Ltd., Perth, Australia			0.8	0.1	–0.8	–0.9
AES Aerospace Embedded Solutions GmbH, Munich	0.2		0.7	1.3	–1.9	–3.0
MTU Maintenance Dallas Inc., Grapevine, USA	0.3	0.1	0.2	0.3	–2.1	–0.8
MTU Maintenance IGT Sevice do Brasil Ltda., São Paulo, Brazil	0.6	0.2	0.3	0.1	–0.6	–1.1
MTU Maintenance Service Center Ayutthaya Ltd., Ayutthaya, Thailand	0.4	0.3	0.2		–1.4	–0.8
Total	**198.2**	**117.2**	**792.7**	**639.6**	**–396.5**	**–109.1**

[1] MTU's share in this company was sold on December 21, 2016

Liabilities to related companies

in € million	Outstanding balance Liabilities		Value of business transactions Revenues / income / sales		Expenses / purchases	
	Dec. 31, 2017	Dec. 31, 2016	2017	2016	2017	2016
IAE International Aero Engines AG, Zürich, Switzerland	41.6	42.3	1,245.5	1,169.5	–966.2	–1,061.0
MTU Turbomeca Rolls-Royce GmbH, Hallbergmoos		0.3		4.1		–0.4
MTU Versicherungsvermittlungs- und Wirtschaftsdienst GmbH, Munich					–8.3	–8.6
MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China	39.4	13.1	11.1	7.7	–264.8	–123.9
PW 1100G-JM Engine Leasing LLC., East Hartford, USA[1]	33.0					
Airfoil Services Sdn. Bhd., Kota Damansara, Malaysia	0.2	0.7	0.3	0.1	–9.1	–7.5
MTU Aero Engines Shanghai Ltd.					–0.7	
Total	**114.2**	**56.4**	**1,256.9**	**1,181.4**	**–1,249.1**	**–1,201.4**

[1] Capital injection outstanding

Major shareholdings

The list of major shareholdings shows MTU Aero Engines Munich's capital share in each company and, unless otherwise specified, the equity that this represents at December 31, 2017, and the profit or loss generated by each company in the reporting period:

Major shareholdings

Name and registered office of entity	Consolidation method [7]	Shareholding in % Dec. 31, 2017	Equity in 000 € Dec. 31, 2017	Profit / loss in 000 € 2017
I. Investments in subsidiaries				
MTU Maintenance Hannover GmbH, Langenhagen	Full	100.00	65,470	[2]
MTU Maintenance Berlin-Brandenburg GmbH, Ludwigsfelde	Full	100.00	88,620	[2]
MTU Aero Engines North America Inc., Rocky Hill, USA	Full	100.00	38,264[3]	11,729[4]
MS Engine Leasing LLC., Rocky Hill, USA [8]	Full	55.50	112,152[3]	6,430[4]
MTU Maintenance Canada Ltd., Richmond, Canada	Full	100.00	55,623[3]	8,374[4]
Vericor Power Systems LLC., Alpharetta, USA [8]	Full	100.00	27,172[3]	–2,949[4]
MTU Aero Engines Polska sp. z o.o., Rzeszów, Poland	Full	100.00	239,658[3]	113,376[4]
MTU Maintenance Lease Services B.V., Amsterdam, Netherlands	Full	80.00	11,935	10,727
MTU Versicherungsvermittlungs- und Wirtschaftsdienst GmbH, Munich	at cost	100.00	26	[2]
MTU München Unterstützungskasse GmbH i. L., Munich, (in liquidation)	[9]	100.00	24	–1
MTU Maintenance Service Centre Ayutthaya Ltd., Ayutthaya, Thailand	at cost	100.00	–23[1,5]	–110[1,6]
MTU Maintenance Dallas Inc., Grapevine, USA	at cost	100.00	–945[3]	–308[4]
MTU Maintenance IGT Service do Brasil Ltda., São Paulo, Brazil	at cost	100.00	236[1,5]	58[1,6]
MTU Aero Engines Finance Netherlands B.V., Amsterdam, Netherlands	at cost	100.00	15[1]	–9[1]
MTU Maintenance Service Centre Australia Pty. Ltd., Perth, Australia	at cost	100.00	514[1,5]	125[1,6]
MTU Aero Engines Shanghai Ltd., Shanghai, China	at cost	100.00	120[3]	3[4]
II. Investments in associated companies				
IAE International Aero Engines AG, Zürich, Switzerland	at equity	25.25	81,386[1,5]	6,604[1,6]
IAE International Aero Engines LLC., East Hartford, USA [10]	at equity	18.00	5,632[3]	3,054[4]
PW 1100G-JM Engine Leasing LLC., East Hartford, USA	at equity	18.00	439,811[3]	33,917[4]
III. Equity investments in joint ventures				
MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China	at equity	50.00	228,300[3]	60,553[4]
MTU Maintenance Hong Kong Ltd., Hong Kong, China [8]	at cost	50.00	–27[3]	–27[4]
Pratt & Whitney Canada Customer Service Centre Europe GmbH, Ludwigsfelde [8]	at equity	50.00	14,582	2,817
Ceramic Coating Center S.A.S., Paris, France	at equity	50.00	6,528	484
Airfoil Services Sdn. Bhd., Kota Damansara, Malaysia	at equity	50.00	25,246[3]	11,514[4]
AES Aerospace Embedded Solutions GmbH, Munich	at equity	50.00	3,943	419
EME Aero sp. z.o.o., Jasionka, Poland	at equity	50.00	2,394[3]	[4]
Turbo Union Ltd., Bristol, England	at cost	39.98	281[1]	–3[1]
EUROJET Turbo GmbH, Hallbergmoos	at cost	33.00	1,657[1]	558[1]
EPI Europrop International GmbH, Munich	at cost	28.00	714[1]	646[1]
MTU Turbomeca Rolls-Royce GmbH, Hallbergmoos	at cost	33.33	56[1]	17[1]
MTU Turbomeca Rolls-Royce ITP GmbH, Hallbergmoos	at cost	25.00	80[1]	53[1]
IV. Other equity investments				
Sumisho Aero Engines Lease B.V., Amsterdam, Netherlands	at cost	10.00	88,771[1,5]	3,125[1,6]

[1] Data for previous year, actuals not yet available
[2] Profit / loss according to German GAAP transferred 2017
[3] Translated at closing exchange rate Dec. 31, 2017
[4] Translated at annual average exchange rate for 2017
[5] Translated at closing exchange rate Dec. 31, 2016
[6] Translated at annual average exchange rate for 2016
[7] - Full = fully consolidated
- at cost = measured at cost of acquisition
- at equity = carrying amount of investment increased or reduced to reflect changes in equity of group's percentage interest
[8] Indirect shareholding
[9] Plan asset
[10] Reclassification

Related persons

No group company has conducted any business subject to disclosure requirements with members of the group's Executive Board or Supervisory Board or with any other individuals holding key management positions, or with companies in which these persons hold a seat on the managing or supervisory board, with the exception of the transactions presented later in this Note, under "Other related party transactions". This also applies to close family members of this group of persons.

Members of the Executive Board

At December 31, 2017, the Executive Board of MTU Aero Engines AG, Munich, comprised the following members:

Members of the Executive Board

Reiner Winkler Chief Executive Officer	Munich
Dr. Rainer Martens Chief Operating Officer	Munich
Michael Schreyögg Chief Program Officer	Munich

Executive Board compensation

More detailed information on the compensation system for MTU's Executive Board, including their company pension entitlements, is provided in the management compensation report in the Corporate Governance section of this Annual Report.

The members of the Executive Board received total compensation amounting to € 8.0 million (2016: € 7.9 million) in the financial year 2017 for their services as board members. This total amount can be broken down into the following components:

Executive Board compensation

	2017		2016	
	in € million[1]	in %	in € million[1]	in %
Short-term employee benefits				
Non-performance-related components	1.8		1.8	
Performance-related components without long-term incentive effect[2]	2.1		1.8	
Performance-related components with long-term incentive effect[3]	3.6		3.8	
Total	**7.5**	**93.7**	**7.4**	**93.7**
Post-employment benefits				
Service cost / past service cost	0.5		0.5	
Total	**0.5**	**6.3**	**0.5**	**6.3**
Total compensation	**8.0**	**100.0**	**7.9**	**100.0**

[1] Amounts relate to compensation awarded to active members of the Executive Board in the respective financial years for their services as board members.

[2] Non-deferred portion of short-term incentive (STI) for the financial year 2017; will be paid in 2018.

[3] Deferred portion of STI for the financial year 2015 will be paid in 2018.

Members of the Executive Board did not receive any compensation for mandates on boards of the group's own companies.

In the reporting period, as in the previous year, no loan facilities or advances were granted to members of the Executive Board. Similarly, as in the previous year, no contingent liabilities were assumed by the company in favor of members of the Executive Board.

At December 31, 2017, the provisions for current and future pension obligations toward former members of the Executive Board amounted to € 8.0 million (2016: € 8.0 million).

Members of the Supervisory Board

As in 2016, the members of the Supervisory Board did not receive any additional compensation for mandates over and above that received for their supervisory board mandate with MTU Aero Engines AG, Munich. This compensation amounted to € 1.0 million (2016: € 1.1 million).

In the financial year 2017, the MTU employees who held seats as employee representatives on the Supervisory Board of MTU Aero Engines AG received salaries under their normal employment contracts (excluding Supervisory Board compensation) totaling € 0.5 million (2016: € 0.6 million). This amount represents the sum of their respective gross salaries.

In the reporting period, as in the previous year, no loan facilities or advances were granted to members of the Supervisory Board. Similarly, as in the previous year, no contingent liabilities were assumed by the company in favor of members of the Supervisory Board.

For details of the compensation awarded to individual members of the Supervisory Board, and other related information, please refer to the management compensation report in the Corporate Governance section of this Annual Report.

Other related party transactions

MTU shares and options bought or sold by members of the Executive Board and the Supervisory Board in the financial year 2017 were bought or sold under terms equivalent to those that prevail in arm's length transactions. The transactions were published in the commercial registry and posted on the MTU website at www.mtu.de/en under Investor Relations > Corporate Governance > Directors' Dealings.

Shareholders

Pursuant to Section 160 (1) item 8 of the German Stock Corporation Act (AktG), information must be provided on the existence of shareholdings which have been notified to the company pursuant to Section 21 (1) or (1a) of the German Securities Trading Act (WpHG). For detailed information, please refer to the chapter "The MTU share."

V. Segment information

39. Segment reporting

MTU reports on two operating segments: the OEM segment (commercial and military engine business) and the MRO segment (commercial maintenance business). Segmentation is based on classifications used in the internal organizational structure and reporting system, which takes into account the risks and returns to which the segments are subject. A detailed description of the operating segments is provided after the consolidated financial statements in the section headed "Reporting by operating segment".

Commercial and military engine business (OEM)
In the commercial and military engine business, the group develops, manufactures, assembles and delivers commercial and military engines and components. The maintenance, repair and overhaul of military engines is also included in this segment.

Commercial maintenance business (MRO)
In the commercial maintenance business, the group maintains, repairs and overhauls aircraft engines and industrial gas turbines. In addition to complete engine maintenance, the services provided also include engine module and parts repairs as well as related services.

Profit/loss of companies accounted for using the equity method
The carrying amount and the share in profit/loss of consolidated group companies accounted for using the equity method are included in reporting by operating segment if such companies can be directly allocated to an operating segment.

Segment assets and segment liabilities
Segment assets comprise all assets that can be allocated to specific operating activities and whose positive or negative operating results have an impact on earnings before interest and tax (EBIT / EBIT adjusted). Assets and liabilities are allocated to the operating segment in which they are used to generate business. The consolidation/reconciliation amount in the segment assets line relates to the consolidation of the carrying amount of subsidiaries and of accounts receivable from intersegment sales of € 857.1 million (2016: € 750.6 million) and to segment liabilities of € 516.5 million (2016: € 409.5 million).

Segment capital expenditure
Segment capital expenditure relates to additions to intangible assets and to property, plant and equipment.

Consolidation/reconciliation column
The amounts in the "consolidation/reconciliation" column for earnings before interest and tax (EBIT/EBIT adjusted) are used to eliminate the effect of intersegment sales.

Segment information by geographical area
External revenues, capital expenditure on intangible assets and property, plant and equipment, and non-current assets are divided into the following regions: Germany, Europe (excluding Germany), North America, Asia and other regions.

Revenues from business with third parties are allocated to the geographical area in which the customer is domiciled. Capital expenditure on intangible assets and property, plant and equipment, and non-current assets are allocated to geographical areas according to the location of the asset in question.

VI. Events after the reporting date

On February 9, 2018, the European Aviation Safety Agency EASA issued an urgent emergency airworthiness directive concerning a limited number of A320neo aircraft fitted with a specific variant of the PW1100G-JM engine. This was preceeded by an investigation into the causes of a number of incidents relating to the high-pressure compressor aft hub of a limited subpopulation of recently delivered PW1100G-JM engines. As a risk- and revenue-sharing partner in the PW1100G-JM consortium, MTU is at the present time unable to rule out the eventuality of major negative economic repercussions in the form of contractual penalties, additional development costs or warranty obligations. Airbus, Pratt & Whitney and the other risk- and revenue-sharing partners are currently elaborating a lasting technical solution on the basis of a root cause analysis of the problem.

Other than this, no events of material importance with any significant impact on the financial situation, net assets or operating results of the MTU group occurred after the end of the reporting period.

VII. Determination of the net profit available for distribution on the basis of the German GAAP annual financial statements

Unlike the consolidated financial statements, which are based on the IFRSs issued by the IASB and endorsed by the EU, the annual financial statements of MTU Aero Engines AG, Munich, are prepared in accordance with the requirements of the German Commercial Code (HGB) and German Stock Cooperation Act (AktG).

Income statement of MTU Aero Engines AG

			Change 2017 - 2016	
in € million	2017	2016	in € million	in %
Revenues	**2,786.1**	**2,667.2**	**118.9**	**4.5**
Cost of sales	–2,373.0	–2,355.1	–17.9	–0.8
Gross profit	**413.1**	**312.1**	**101.0**	**32.4**
Selling costs	–71.5	–63.4	–8.1	–12.8
General administrative expenses	–36.8	–40.4	3.6	8.9
Balance of other operating income and expenses	–19.8	20.1	–39.9	<-100
Financial result	132.0	144.7	–12.7	–8.8
Earnings from ordinary operating activities	**417.0**	**373.1**	**43.9**	**11.8**
Tax expense	–131.6	–101.9	–29.7	–29.1
Net profit for the year	**285.4**	**271.2**	**14.2**	**5.2**
Allocations to other reserves [1]	–142.7	–135.6	–7.1	–5.2
Net profit available for distribution	**142.7**	**135.6**	**7.1**	**5.2**

[1] For allocation to other revenue reserves in accordance with Section 58 II of the German Stock Corporation Act (AktG) following approval by the Supervisory Board

Allocation to revenue reserves

In accordance with Section 58 (2) of the German Stock Corporation Act (AktG), the Executive Board will propose to the Supervisory Board of MTU Aero Engines AG that a total of € 142.7 million of the 2017 net profit be allocated to other reserves (2016: € 135.6 million).

Proposed profit distribution

Furthermore, the Executive Board recommends that the Supervisory Board propose to the Annual General Meeting on April 11, 2018 that a dividend of € 2.30 (2016: € 1.90) per share be distributed for the financial year 2017. On the condition that this proposal is accepted by the Annual General Meeting, the total dividend payment for the 51,499,842 shares entitled to a dividend would amount to € 118.4 million. Based on the quoted share price at the close of 2017 of € 149.40 (2016: € 109.80), this would be equivalent to a dividend yield of 1.5% (2016: 1.7%).

Pending approval by the Annual General Meeting, the dividend for the financial year 2017 would be paid on April 16, 2018.

Federal Gazette (Bundesanzeiger)

The annual financial statements, consolidated financial statements and combined management report of MTU Aero Engines AG, Munich, are published in the Electronic Federal Gazette (elektronischer Bundesanzeiger). Print copies can be obtained on request from MTU Aero Engines AG, 80995 Munich, Germany.

Declaration of conformity with the German Corporate Governance Code

The declaration of conformity by the Executive Board and Supervisory Board of MTU Aero Engines AG, Munich, pursuant to Section 161 of the German Stock Corporation Act (AktG) is published in the MTU Annual Report 2017 and also permanently available to shareholders on the MTU website at www.mtu.de.

Statement by the legal representatives

We hereby affirm that, to the best of our knowledge, the consolidated financial statements present a true and fair view of the group's net assets, financial position and operating results in accordance with the applicable financial reporting standards, and that the combined management report provides a faithful and accurate review of the group's business performance, including operating results and situation, and outlines the significant risks and opportunities of the group's likely future development.

Munich, February 19, 2018

Reiner Winkler
Chief Executive Officer

Peter Kameritsch
Chief Financial Officer and Chief Information Officer

Michael Schreyögg
Chief Program Officer

Lars Wagner
Chief Operating Officer

Translation of the German independent auditor's report concerning the audit of the consolidated financial statements and combined management report prepared in German:

Independent auditor's report

To MTU Aero Engines AG

Report on the audit of the consolidated financial statements and of the combined management report

Opinions

We have audited the consolidated financial statements of MTU Aero Engines AG, Munich, and its subsidiaries (the "Group"), which comprise the consolidated income statement and consolidated statement of comprehensive income for the fiscal year from 1, January 2017 to 31 December 2017, the consolidated balance sheet as of 31 December 2017, the consolidated statement of changes in equity and the consolidated cash flow statement for the fiscal year from 1 January 2017 to 31 December 2017, and the notes to the consolidated financial statements, including the recognition and measurement principles presented therein. In addition, we have audited the group management report, which is combined with the management report of MTU Aero Engines AG, Munich ("combined management report"), for the fiscal year from 1 January 2017 to 31 December 2017. In accordance with the German legal requirements, we have not audited the content of the non-financial statement contained in the "Business environment" section of the combined management report or the declaration of conformity in the "Other disclosures" section of the combined management report.

In our opinion, on the basis of the knowledge obtained in the audit,

- the accompanying consolidated financial statements comply, in all material respects, with the International Financial Reporting Standards (IFRSs) as adopted by the EU and the supplementary provisions of German law pursuant to Sec. 315e (1) HGB ["Handelsgesetzbuch": German Commercial Code] and give a true and fair view of the assets, liabilities and financial position of the Group as of 31 December 2017 and of its financial performance for the fiscal year from 1 January 2017 to 31 December 2017 in accordance with German legally required accounting principles, and
- the accompanying combined management report as a whole provides an appropriate view of the Group's position. In all material respects, this combined management report is consistent with the consolidated financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development. Our opinion on the combined management report does not cover the content of the non-financial statement contained in the "Business environment" section of the combined management report or the declaration of conformity in the "Other disclosures" section of the combined management report.

Pursuant to Sec. 322 (3) Sentence 1 HGB, we declare that our audit has not led to any reservations relating to the legal compliance of the consolidated financial statements and of the combined management report.

Basis for the opinions

We conducted our audit of the consolidated financial statements and the combined management report in accordance with Sec. 317 HGB and the EU Audit Regulation (No 537/2014, referred to subsequently as "EU Audit Regulation") and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). Our responsibilities under those requirements and principles are further described in the "Auditor's responsibilities for the audit of the consolidated financial statements and of the combined management report" section of our auditor's report. We are independent of the Group in accordance with the requirements of European law and German commercial and professional law, and we have fulfilled our other German professional responsibilities in accordance with these requirements. In addition, in accordance with Art. 10 (2) f) of the EU Audit Regulation, we declare that we have not provided non-audit services prohibited under Art. 5 (1) of the EU Audit Regulation. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinions on the consolidated financial statements and on the combined management report.

Key audit matters in the audit of the consolidated financial statements

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements for the fiscal year from 1 January 2017 to 31 December 2017. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon; we do not provide a separate opinion on these matters.

Below, we describe what we consider to be the key audit matters:

1. Recognizing revenue and allocating cost of sales from risk- and revenue-sharing partnerships

Reasons why the matter was determined to be a key audit matter

The MTU Group primarily generates its revenue in the commercial and military engine business (OEM segment) from Risk- and Revenue-Sharing Partnerships with other engine manufacturers. Revenue from the sale of products is recognized when the significant risks and rewards of ownership of the goods have passed to the Risk- and Revenue-Sharing Partnership. This is normally immediately before the point in time when economic ownership passes to their customers via the Risk- and Revenue-Sharing Partnerships. The timing and amount of the revenue to be recognized are based on reporting from the Risk- and Revenue-Sharing Partnerships. Additional cost of sales are allocated from the Risk- and Revenue-Sharing Partnerships as well as the Group's own cost of sales. These are recorded at the time of revenue recognition based on reporting from the Risk- and Revenue-Sharing Partnerships. If this reporting is delayed, revenue and cost of sales from the sale of such goods and services are allocated based on qualified estimates that take the contractual arrangements into account. There is a risk of error when allocating revenue and cost of sales as well as of fraud on account of incentives to achieve certain performance targets and forecasts. The significance of revenue and cost of sales for the consolidated financial statements, the discretionary scope involved in estimates and the fact that revenue and EBIT are financial performance indicators for the Group in terms of corporate management and forecasts meant that the recognition of revenue and the allocation of cost of sales from Risk- and Revenue-Sharing Partnerships as of the reporting date was a key audit matter.

Auditor's response

To assess the appropriateness of the recognition of revenue and cost of sales from Risk- and Revenue-Sharing Partnerships, we relied on a controls-based approach during the audit and assessed the structure as well as the effectiveness of the underlying corporate processes and controls. We mainly performed assertion-based audit procedures by reconciling revenue and cost of sales entries with the current reporting of Risk- and Revenue-Sharing Partnerships on a sample basis. We reconciled information from these reports with the underlying agreements on a sample basis. To assess the amount of revenue estimated for the month of December 2017, we reconciled the estimated values with the reporting of the Risk- and Revenue-Sharing Partnerships from January 2018. We also reconciled the revenue entries to the payments received on a sample basis and analyzed credit notes issued in January 2018 for errors relating to recognizing revenue in the correct period. We also analyzed the interim transaction data for anomalies. In this context, our procedures included correlation analyses and time series analyses. We reconciled non-standard transactions, journal entries and closing entries to the underlying documents on a sample basis.

Our audit procedures did not lead to any reservations relating to the recognition of revenue and the allocation of cost of sales from Risk- and Revenue-Sharing Partnerships.

Reference to related disclosures

The disclosures in the notes to the consolidated financial statements on the principles of recognizing revenue and cost of sales are contained in section I. "Accounting policies and principles" in the subsections on "Revenues" and "Cost of sales" as well as "Discretionary scope, measurement uncertainties and sensitivity". The significance of revenue in connection with corporate management as well as with regard to the business development and forecast is also presented in the "Group internal control system" and "Financial performance indicators" sections of the combined management report.

2. Reasons why the matter was determined to be a key audit matter

Reasons why the matter was determined to be a key audit matter

In the civil engine maintenance business (MRO segment), the Group generates revenue from rendering maintenance services for engines and industrial gas turbines. If revenue for long-term service agreements is recorded depending on the degree of completion based on the relative costs incurred or to the extent that the expenses incurred could be requested again and taking into account the margin estimated for the term of the agreement, there is a risk of error or fraud when determining the degree of completion and the profit margin on account of incentives to achieve certain performance targets and forecasts. The significance of revenue for the consolidated financial statements, the discretionary scope involved in estimates and the fact that revenue is a financial performance indicator for the Group in terms of corporate management and forecasts meant that the recognition of revenue including the degree of completion, profit margin and allocation to the correct period was a key audit matter.

Auditor's response

To assess the recognition of revenue including the degree of completion, profit margin and allocation to the correct period, we relied on a controls-based approach during the audit and assessed the structure as well as the effectiveness of the underlying corporate processes and controls. Assertion-based audit procedures mainly included reviewing significant agreements as well as reconciling revenue and cost of sales with the underlying calculation of the degree of completion. We reconciled the profit margins used for accounting purposes from the maintenance business with the corporate planning or additional documents for project planning and had management explain these to us. We also analyzed the interim transaction data for anomalies. In this context, our procedures included correlation analyses and time series analyses. We reconciled non-standard transactions, journal entries and closing entries to the underlying documents on a sample basis.

Our audit procedures did not lead to any reservations relating to the recognition of revenue for long-term service agreements.

Reference to related disclosures

The disclosures in the notes to the consolidated financial statements on the principles of recognizing revenue and cost of sales are contained in section I. "Accounting policies and principles" in the subsections on "Revenues" as well as "Discretionary scope, measurement uncertainties and sensitivity". The significance of revenue in connection with corporate management as well as with regard to the business development and forecast is also presented in the "Group internal control system" and "Financial performance indicators" sections of the combined management report.

3. Measurement of provisions for warranty obligations as well as risks from pending transactions

Reasons why the matter was determined to be a key audit matter

In the consolidated financial statements of MTU Aero Engines AG, provisions for warranty obligations and risks from pending transactions are reported as "Other provisions" under non-current and current liabilities in the balance sheet. Provisions relate to statutory and agreement-specific obligations and comprise estimates made on both a case-by-case and general basis. During the audit, we determined the measurement of provisions for warranties as well as risks from pending transactions as a key audit matter because the measurement of these items, the amounts of which are significant, is based to a large extent on the executive directors' estimates and assumptions, in particular with regard to the technical risks as well as the amount of the anticipated costs.

Auditor's response

To assess the measurement of provisions for warranty obligations as well as risks from pending transactions, we examined the process of preparing the separate and consolidated financial statements, interviewed representatives of MTU Aero Engines AG and inspected agreements, correspondence and other documentation. In particular, we assessed the underlying measurement methods and key valuation parameters and checked the calculations for arithmetical accuracy. We also obtained and evaluated confirmations from lawyers and interviewed representatives from the legal department to assess the measurement.

Our audit procedures did not lead to any reservations relating to the measurement of provisions for warranty obligations as well as risks from pending transactions.

Reference to related disclosures

The disclosures in the notes to the consolidated financial statements on provisions are contained in section I. "Accounting policies and principles" in the subsections on "Other provisions" as well as "Discretionary scope, measurement uncertainties and sensitivity" and in section III. "Notes to the consolidated balance sheet" in the subsection "27. Other provisions".

4. Recoverability of program values and capitalized development costs from Risk- and Revenue-Sharing Partnerships

Reasons why the matter was determined to be a key audit matter

There are Risk- and Revenue-Sharing Partnerships with other engine manufacturers. Payments are made in order to enter into these partnerships, which are recognized as program values in the consolidated financial statements. Furthermore, internally-funded development services are rendered, which are capitalized as development costs. The management board of MTU Aero Engines AG analyzes these intangible assets for impairment at each reporting date. The basis for this is the planning of the individual engine programs over the remaining program term. An asset's or overarching cash-generating unit's discounted cash surpluses are compared to the corresponding carrying amount. The Company determines the discount rate (WACC) using external valuation experts. The assessment of whether the capitalized program values and development costs

are impaired is based to a large extent on estimates by the Company's executive directors. The resulting discretionary scope gives rise to a generally higher risk for accounting misstatements. Against this background, the assessment of whether the program values and capitalized development costs from Risk- and Revenue-Sharing Partnerships were impaired was a key audit matter.

Auditor's response

To test the plausibility of the program planning, we first worked intensively on the planning process of MTU Aero Engines AG. We also requested evidence to show to what extent external sources are included in the planning process. Building on this, we used variance analyses to compare the program planning with the prior-planning and assessed the planning assumptions based on interviews with the responsible program officers. We assessed the WACC calculation by consulting internal valuation specialists, in particular by comparing the peer group with comparable companies from an external database, reconciled market data and checked for arithmetical accuracy. We checked the completeness of the net assets' carrying amount. We assessed the appropriateness of the valuation model for impairment testing. To conclude, we checked the valuation model for arithmetical accuracy and checked the results of the impairment testing for plausibility using our own sensitivities and assessed the sensitivities used by the Company.

Our audit procedures did not lead to any reservations relating to whether the program values and capitalized development costs from Risk- and Revenue-Sharing Partnerships were impaired.

Reference to related disclosures

The disclosures in the notes to the consolidated financial statements on program values and capitalized development costs are contained in section I. " Accounting policies and principles" in the subsections on "Research and development expenses", "Intangible assets", "Impairment of intangible assets and property, plant and equipment" as well as "Discretionary scope, measurement uncertainties and sensitivity". There are also disclosures in the notes to the consolidated financial statements in section II. "Notes to the consolidated income statement" in the subsection on "3. Research and development costs" as well as in section III. "Notes to the consolidated balance sheet" in the subsections on "13. Analysis of changes in intangible assets and property, plant and equipment" and "14. Intangible assets". Further disclosures on capitalized research and development costs are presented in the "Research and development" section of the combined management report.

Other information

The executive directors are responsible for other information. The other information comprises:

- Non-financial statement in the "Business environment" section of the combined management report
- Declaration of conformity in the "Other disclosures" section of the combined management report
- The "MTU share", "Selected consolidated financial information and key figures with year-on-year comparison", "The Executive Board" as well as "Letter to our shareholders" sections of the 2017 annual report
- "Corporate governance", "Declaration of conformity" and "The Supervisory Board" in the "Corporate governance report" section of the 2017 annual report
- The "Worldwide. 24/7." image section in the 2017 annual report, which was included in the consolidated financial statements and combined management report in the annual report and can be identified by the footnote "Not part of the audited consolidated financial statements and combined management report"
- The "Additional disclosures" section of the 2017 annual report

The Supervisory Board is responsible for other information as follows:

- "Report of the Supervisory Board" in the "Corporate governance report" section of the 2017 annual report

Our opinions on the consolidated financial statements and combined management report do not cover the other information, and we therefore do not provide an opinion or any other form of audit conclusion on these matters.

In connection with our audit, our responsibility is to read the other information and to assess whether the other information

- is inconsistent in any material respect with the consolidated financial statements, the combined management report or our knowledge obtained in the audit, or
- otherwise appears to be misstated in any material respect.

Responsibilities of the executive directors and the Supervisory Board for the consolidated financial statements and the combined management report

The executive directors are responsible for the preparation of the consolidated financial statements that comply, in all material respects, with IFRSs as adopted by the EU and the supplementary provisions of German law pursuant to Sec. 315e (1) HGB, and for the preparation of consolidated financial statements that give a true and fair view of the assets, liabilities, financial position and financial performance of the Group in accordance with these requirements. In addition, the executive directors are responsible for such internal control as they have determined necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the executive directors are responsible for assessing the Group's ability to continue as a going concern. They also have the responsibility for disclosing, as applicable, matters related to going concern. In addition, they are responsible for financial reporting based on the going concern basis of accounting unless there is an intention to liquidate the Group or to cease operations, or there is no realistic alternative but to do so.

Furthermore, the executive directors are responsible for the preparation of the combined management report that, as a whole, provides an appropriate view of the Group's position and is, in all material respects, consistent with the consolidated financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development. In addition, the executive directors are responsible for such arrangements and measures (systems) as they have considered necessary to enable the preparation of a combined management report that is in accordance with the applicable German legal requirements, and to be able to provide sufficient appropriate evidence for the assertions in the combined management report.

The Supervisory Board is responsible for overseeing the Group's financial reporting process for the preparation of the consolidated financial statements and of the combined management report.

Auditor's responsibilities for the audit of the consolidated financial statements and of the combined management report

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and whether the combined management report as a whole provides an appropriate view of the Group's position and, in all material respects, is consistent with the consolidated financial statements and the knowledge obtained in the audit, complies with the German legal requirements and appropriately presents the opportunities and risks of future development, as well as to issue an auditor's report that includes our opinions on the consolidated financial statements and on the combined management report.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Sec. 317 HGB and the EU Audit Regulation and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer (IDW) will always detect a material misstatement. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements and this combined management report.

We exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements and of the combined management report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinions. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit of the consolidated financial statements and of arrangements and measures (systems) relevant to the audit of the combined management report in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of these systems.
- Evaluate the appropriateness of accounting policies used by the executive directors and the reasonableness of estimates made by the executive directors and related disclosures.
- Conclude on the appropriateness of the executive directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in the auditor's report to the related disclosures in the consolidated financial statements and in the combined management report or, if such disclosures are inadequate, to modify our respective opinions. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to be able to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements present the underlying transactions and events in a manner that the consolidated financial statements that comply with IFRSs as adopted in the EU and the additional requirements of German commercial law pursuant to Sec. 315e (1) HGB give a true and fair view of the assets, liabilities, financial position and financial performance of the Group.
- Obtain sufficient appropriate audit evidence regarding the financial information of the businesses or business activities within the Group to express opinions on the consolidated financial statements and on the combined management report. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our opinions.
- Evaluate the consistency of the combined management report with the consolidated financial statements, its conformity with [German] law and the view of the Group's position it provides.
- Perform audit procedures for the forward-looking disclosures made by the executive directors in the combined management report. On the basis of sufficient appropriate audit evidence we evaluate, in particular, the significant assumptions used by the executive directors as a basis for the prospective information, and evaluate the proper derivation of the prospective information from these assumptions. We do not express a separate opinion on the prospective information and on the assumptions used as a basis. There is a substantial unavoidable risk that future events will differ materially from the prospective information.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter.

Other legal and regulatory requirements

Further information pursuant to Art. 10 of the EU Audit Regulation

We were elected as auditor of the consolidated financial statements by the annual general meeting on 4 May 2017. We were engaged by the Supervisory Board on 24 October 2017. We have been the auditor of MTU Aero Engines AG for an uninterrupted period since the audit of the consolidated financial statements for fiscal year 2014.

We declare that the opinions expressed in this auditor's report are consistent with the additional report to the audit committee pursuant to Art. 11 of the EU Audit Regulation (long-form audit report).

German Public Auditor responsible for the engagement

The German Public Auditor responsible for the engagement is Siegfried Keller.

Munich, 27 February 2018

Ernst & Young GmbH
Wirtschaftsprüfungsgesellschaft

Keller	Westermeier
Wirtschaftsprüfer [German Public Auditor]	Wirtschaftsprüfer [German Public Auditor]

Independent Auditor's Limited Assurance Report

The assurance engagement performed by Ernst & Young (EY) relates exclusively to the German PDF version of the combined non-financial statement 2017 of MTU Aero Engines AG. The following text is a translation of the original German Independent Assurance Report.

To MTU Aero Engines AG, Munich

We have performed a limited assurance engagement on the group non-financial statement of MTU Aero Engines AG (hereafter MTU) according to § 315b HGB ("Handelsgesetzbuch": German Commercial Code), which is combined with the non-financial statement of the parent company according to § 289b HGB, consisting of the chapter "Non-financial statement" in the group management report as well as the section "The enterprise MTU" in the group management report being incorporated by reference (hereafter combined non-financial statement), for the reporting period from 1 January 2017 to 31 December 2017. Our engagement did not include any disclosures for prior years.

Management's responsibility

The legal representatives of the Company are responsible for the preparation of the combined non-financial statement in accordance with §§ 315c in conjunction with 289c to 289e HGB.

This responsibility includes the selection and application of appropriate methods to prepare the combined non-financial statement as well as making assumptions and estimates related to individual disclosures, which are reasonable in the circumstances. Furthermore, the legal representatives are responsible for such internal controls that they have considered necessary to enable the preparation of a combined non-financial statement that is free from material misstatement, whether due to fraud or error.

Auditor's declaration relating to independence and quality control

We are independent from the entity in accordance with the provisions under German commercial law and professional requirements, and we have fulfilled our other professional responsibilities in accordance with these requirements.

Our audit firm applies the national statutory regulations and professional pronouncements for quality control, in particular the by-laws regulating the rights and duties of Wirtschaftsprüfer and vereidigte Buchprüfer in the exercise of their profession [Berufssatzung für Wirtschaftsprüfer und vereidigte Buchprüfer] as well as the IDW Standard on Quality Control 1: Requirements for Quality Control in audit firms [IDW Qualitätssicherungsstandard 1: Anforderungen an die Qualitätssicherung in der Wirtschaftsprüferpraxis (IDW QS 1)].

Auditor's responsibility

Our responsibility is to express a limited assurance conclusion on the combined non-financial statement based on the assurance engagement we have performed.

We conducted our assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 (Revised): Assurance Engagements other than Audits or Reviews of Historical Financial Information, issued by the International Auditing and Assurance Standards Board (IAASB). This Standard requires that we plan and perform the assurance engagement to obtain limited assurance about whether the combined non-financial statement of the Company has been prepared, in all material respects, in accordance with §§ 315c in conjunction with 289c to 289e HGB. In a limited assurance engagement the assurance procedures are less in extent than for a reasonable assurance engagement and therefore a substantially lower level of assurance is obtained. The assurance procedures selected depend on the auditor's professional judgment.

Within the scope of our assurance engagement, which has been conducted between October 2017 and February 2018, we performed amongst others the following assurance and other procedures:

- Inquiries of employees regarding the selection of topics for the combined non-financial statement, the risk assessment and the concepts of MTU for the topics that have been identified as material,
- Inquiries of employees responsible for data capture and consolidation as well as the preparation of the combined non-financial statement, the reporting processes, the data capture and compilation methods as well as internal controls to the extent relevant for the assurance of the combined non-financial statement,
- Inspection of relevant documentation of the systems and processes for compiling, analyzing and aggregating data in the relevant areas, e.g. environment and employees in the reporting period and testing such documentation on a sample basis,
- Inquiries and inspection of documents on a sample basis relating to the collection and reporting of selected data during site visits in Munich and Hanover,
- Analytical procedures at group level regarding the quality of the reported data,

- Evaluation of the presentation of disclosures in the combined non-financial statement.

Assurance conclusion

Based on our assurance procedures performed and assurance evidence obtained, nothing has come to our attention that causes us to believe that the combined non-financial statement of MTU Aero Engines AG for the period from 1 January 2017 to 31 December 2017 has not been prepared, in all material respects, in accordance with §§ 315c in conjunction with 289c to 289e HGB.

Intended use of the assurance report

We issue this report on the basis of the engagement agreed with MTU Aero Engines AG. The assurance engagement has been performed for the purposes of the Company and the report is solely intended to inform the Company as to the results of the assurance engagement and must not be used for purposes other than those intended. The report is not intended to provide third parties with support in making (financial) decisions.

Engagement terms and liability

The "General Engagement Terms for Wirtschaftsprüfer and Wirtschaftsprüfungsgesellschaften [German Public Auditors and Public Audit Firms]" dated 1 January 2017 are applicable to this engagement and also govern our relations with third parties in the context of this engagement (see http://www.ey.com/Publication/vwLUAssets/EY-idw-aab-2017-en/$FILE/EY-idw-aab-2017-en.pdf). In addition, please refer to the liability provisions contained there in no. 9 and to the exclusion of liability towards third parties. We assume no responsibility, liability or other obligations towards third parties unless we have concluded a written agreement to the contrary with the respective third party or liability cannot effectively be precluded.

We make express reference to the fact that we do not update the assurance report to reflect events or circumstances arising after it was issued unless required to do so by law. It is the sole responsibility of anyone taking note of the result of our assurance engagement summarized in this assurance report to decide whether and in what way this result is useful or suitable for their purposes and to supplement, verify or update it by means of their own review procedures.

Munich, 27 February 2018

Ernst & Young GmbH
Wirtschaftsprüfungsgesellschaft

Nicole Richter	Nina Müller
Wirtschaftsprüferin (German Public Auditor)	Wirtschaftsprüferin (German Public Auditor)

Munich
Germany

World-beating manufacturing technology: final assembly of the PW1100G-JM engine for the A320neo in Munich

Munich
Germany

World-beating manufacturing technology: final assembly of the PW1100G-JM engine for the A320neo in Munich

BACKGROUND INFORMATION

Geared Turbofan™

Five renowned aircraft manufacturers have opted for the Geared Turbofan™ engine to power their aircraft: Airbus for the A320neo, Bombardier for the C Series, Mitsubishi for the MRJ regional jet, Embraer for the second generation of E-Jets and Irkut for the MC-21. MTU's workshare in the engines of the PW1000G family is between 15 and 18 percent.

In addition to being responsible for the high-speed, low-pressure turbine and the first four stages of the high-pressure compressor, MTU also manufactures brush seals and nickel blisks for components of the high-pressure compressor that do not lie within MTU's design responsibility. MTU is also responsible for the final assembly of 30 percent of the PW1000G-JM production engines powering the A320neo.

MTU Aero Engines' headquarters and – with over 4,700 employees – largest production site is in Munich. A traditional aviation site, Munich is inextricably linked to the history of powered flight – its roots reaching back to the early 20th century.

It's 5.15 a.m. in Munich. A group of employees is just starting the early shift at the MTU location, among them Elmar Stichlmair, who heads up PW1100G-JM industrialization. His destination is the final assembly line where since 2016 the PW1100G-JM production engine for the A320 neo has been assembled. For MTU, this presents quite a challenge, since it is the first time MTU has been responsible for the complete assembly of a commercial engine. MTU was awarded the contract to assemble 30 percent of all PW1100G-JM engines by cooperation partner and OEM Pratt & Whitney back in 2011–as one of only three sites worldwide.

Innovative manufacturing technology

Since then a lot has happened. The final assembly line had to be completely reconfigured, with the proviso that it should take up as little floor space as possible and, most importantly, offer a high

MTU assembles 30 percent of all PW1100G-JM engines, as one of only three locations worldwide selected for this task. The innovative final assembly system in Munich is unique of its kind in the world.

degree of flexibility. Engines are normally assembled using cranes that run on rails suspended from the ceiling. “We had the idea to organize the assembly process using a floor-based system,” Stichlmair explains. The result is a bespoke system featuring sophisticated and unique manufacturing technology. It comprises up to 16 carts which, coupled together depending on the stage of assembly, move forward along the line in a similar way to a conveyor belt. The key to the whole process is the carefully timed “fishbone” layout. “In total, there are eight main assembly steps, with pre-assembled components and modules dovetailing in from the sides,” says Stichlmair, explaining the system’s efficiency. The sequences on the final assembly line are choreographed down to the last detail. Flowcharts systematize the use of lubricants, for example, or with which tool and torque the engineer should tighten a screw.

Steep ramp-up

This detailed planning has paid off: in May 2016, the first engine on which the processes were to be tested arrived in Munich from the United States. The system worked without a hitch from the very beginning. Also at the first go, auditors from the Federal Aviation Administration (FAA), the U.S. aviation authority, gave the new assembly concept the go-ahead in early August 2016. In late August, MTU delivered the first assembled production engine to Airbus. Since then, the company has been experiencing a steep ramp-up: from 2019, MTU plans to supply up to 240 engines a year to Airbus in Toulouse or Hamburg.

Engine components for the PW1000G family are produced using advanced manufacturing technologies: here a view of the blisk production facility.

Both the assembly and testing processes were audited and approved by the U.S. aviation authority FAA.

Additional information

Glossary of engine terms

Blisk
Blisks, or blade integrated disks, are high-tech components where disk and blades are manufactured as a single part. This configuration delivers greater strength and better aerodynamic properties at less weight.

Combustor
A combustor or combustion chamber consists of an outer casing and an inner liner within which the actual combustion takes place. Inside, the inflowing air from the compressor is mixed with fuel and ignited. The combustion process generates temperatures of over 2,000 degrees Celsius. In order to withstand these high temperatures, especially the inner liner of the combustion chamber must be cooled and must be protected by special thermal barrier coatings.

Compressor
The task of the compressor is to ingest air and compress it before it is fed into the combustor. Compressors consist of bladed disks (rotors) that rotate at very high speed between stationary guide vanes (stators). In order to achieve a compression ratio of over 40:1, which is standard in all modern two-shaft engines, it is necessary to use multi-stage low-pressure and high-pressure compressors rotating at different speeds on dual concentric shafts. These are driven by the corresponding turbines.

Fan
The first rotor of the low-pressure compressor is called the fan. It accelerates the bypass stream flowing aftward and provides the engine's main thrust. It is driven by the low-pressure turbine via the low-pressure shaft.

Geared Turbofan™
What sets the new Geared Turbofan™ propulsion system apart is that it features a reduction gearbox between the fan and the low-pressure shaft on which the low-pressure compressor and low-pressure turbine that drives the fan are seated. The gearbox allows the fan with its large diameter to rotate more slowly, and at the same time the low-pressure compressor and turbine to rotate much faster. This enables lower fan pressure ratios and therefore higher bypass ratios to be achieved, and the individual components to operate at their respective optimum speeds. As a result, the efficiency of Geared Turbofan™ is greatly boosted, and fuel consumption as well as carbon dioxide and noise emissions are significantly reduced. The propulsion system is moreover lighter than a conventional engine owing to the reduced compressor and turbine stage count.

Industrial gas turbine
The operating principle of an industrial gas turbine is essentially the same as that of an aero engine. However, instead of the customary low-pressure turbine used in aircraft, industrial gas turbines have a power turbine. This turbine delivers the power, either directly or via a gear unit, to an additional attached power unit such as a pump or generator. Nearly all industrial gas turbines of the lower and intermediate power classes are aero-engine derivatives.

MRO business
MRO stands for maintenance, repair and overhaul. At MTU, the term "MRO business" is also used more specifically to designate one of the company's two business segments, where it refers to maintenance services for commercial engines, or commercial MRO.

OEM business
OEM stands for original equipment manufacturer. At MTU, the term "OEM business" is used to designate one of the company's two operating segments, where it refers to the development, manufacture and assembly of (new) commercial and military engines. Spare parts for (in-service) commercial and military engines and maintenance services for military engines are also included in this operating segment.

Risk- and revenue-sharing partnership
In a risk- and revenue-sharing partnership, each partner contributes a certain share of the resources needed for a specific engine program (work capacity and funding), thus bearing part of the risk. In return, each partner is entitled to a corresponding percentage of the overall sales revenue from that program.

Subsystem
A complete aircraft engine is made up of a number of subsystems. These include the high-pressure and low-pressure compressors, the combustor, the high-pressure and low-pressure turbines and the engine control system.

Thrust class
Jet engines are generally grouped into three thrust classes: engines with a thrust of between 2,500 and around 20,000 pounds (roughly 10 to 90 kN), mainly used to power business and regional jets, engines with a thrust of between 20,000 and approximately 50,000 pounds (roughly 90 to 225 kN), used to power medium-haul aircraft, and engines with a thrust ranging from 50,000 to over 100,000 pounds (roughly 225 to 450 kN), used to power long-haul aircraft.

Turbine
In a turbine, the energy contained in the gases emerging at high pressure and velocity from the combustor is converted into mechanical energy. Like the compressor, the turbine is subdivided into a high-pressure and a low-pressure section, each of which is directly connected to the corresponding compressor via the respective shaft. The turbine has to withstand much higher stresses than the compressor, as it has to deal not only with the high gas temperatures but also with extreme centrifugal forces of several tons acting on the outer rim of its disks.

Turbine center frame
The turbine center frame connects the high-pressure to the low-pressure turbine. It has to be able to withstand high mechanical and thermal loads. The center frame includes struts to support the shaft bearings, clad with an aerodynamic fairing, and the air and oil supply lines.

Turbofan engine
The turbofan is an advancement of the turbojet principle, the main difference being its enlarged first compressor stage, the fan. While in turbojet engines, all of the ingested air flows consecutively through the compressor, the combustor and the turbine, turbofans separate the air stream behind the fan. A fraction of the air reaches the combustor via a number of further compressor stages and is burned. The rest, however—which constitutes a much larger fraction – is channeled around the inner components. The ratio between these two airflows is known as the bypass ratio. The greater the bypass ratio, the more economical, environmentally compatible and silent the engine.

Turboprop engine
The most noticeable external feature of a turboprop is its propeller. Inside, however, the engine differs only slightly from the turbojet and the turbofan. The turbine is larger, and drives not only the compressor but also the propeller, the latter via a gear unit. Consequently, more energy has to be drawn from the exhaust gas stream in the turbine of a turboprop than in that of other engine types. Over 90 percent of the energy is required for the compressor and the propeller. Turboprop airplanes can achieve flight speeds of up to 800 km/h. They are thus slower than turbojets or turbofans, but they do have the advantage of consuming far less fuel. This predestines them for use in roles where speed is less important, such as on short-haul routes or for air freight.

Turboshaft engine
Turboshaft engines are used in helicopters and are similar to turboprops.

Overview of engines

Commercial engines

Long-haul airliners	
CF6	Airbus A300, A310, A330, Boeing 747, 767, DC-10, MD-11, KC-10
GE90-110B/-115B*	Boeing 777-200LR, 777-200F, 777-300ER
GE9X	Boeing 777X
GEnx	Boeing 787, 747-8
GP7000	Airbus A380
PW4000Growth	Boeing 777
Short- and medium-haul aircraft	
CF34*	business and regional jets
CFM56*	Boeing 737, Airbus A318–A321
JT8D-200	Boeing MD-80
PW1000G	Airbus A320neo, Bombardier C Series, Mitsubishi Regional Jet, Embraer E-Jets Gen 2, Irkut MC-21
PW2000	Boeing 757, C-17
PW6000	Airbus A318
V2500	Airbus A319, A320, A321, Boeing MD-90, Embraer KC-390
Business jets	
PT6A**	business and regional jets
PW100/150A**	ATR42, 72, Fokker 50, Bombardier Q400
JT15D**	Cessna Citation I/II/V/Ultra, Beechjet 400
PW300	medium-weight business and regional jets
PW500	light and medium-weight business jets
PW600**	Cessna Mustang, Eclipse 500, Embraer Phenom 100
PW800	Gulfstream G500, G600
Helicopters	
PT6B/-C/-T**	AgustaWestland 119, 139, Airbus Helicopters H175
PW200/PW210**	light-to-medium weight helicopters

* *MRO only*

** *MRO only: via Pratt & Whitney Canada Customer Service Centre Europe GmbH*

Military engines

Fighter jets	
EJ200	Eurofighter
F110	Lockheed Martin F-16, Boeing F-15
F414	Boeing F/A-18E/F Super Hornet, Boeing EA-18G Growler, Saab Gripen next generation
Larzac 04	Dornier-Dassault Alpha Jet
RB199	Panavia Tornado
Helicopters	
T408	Sikorsky CH-53K
MTR390/MTR390 Enhanced	Airbus Helicopters Tiger
T64	Sikorsky CH-53G, GS, GA, GE
Transporters	
TP400-D6	Airbus A400M
Tyne	Transall C-160, Breguet Atlantic

Industrial gas turbines

ASE8/40/50, TF40/50, ETF40	Electrical power systems, power systems for ships, mechanical power systems, generator sets
LM2500/LM2500+	Electrical power stations, mechanical power systems, oil and gas industry, power systems for ships
LM5000	Electrical power stations, mechanical power systems, oil and gas industry
LM6000 / LM6000-PF+	Electrical power stations

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List of charts and illustrations

Financial calendar

April 11, 2018	Annual General Meeting
April 27, 2018	Quarterly Statement as at March 31, 2018
	Conference call with analysts and investors
July 26, 2018	Interim Report as at June 30, 2018
	Conference calls with journalists, analysts and investors
October 25, 2018	Quarterly Statement as at September 30, 2018
	Conference calls with journalists, analysts and investors
November 30, 2018	MTU Investor and Analyst Day

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Translation
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