MTU Aero Engines

*Annual Report 2016*

# MTU 4.0

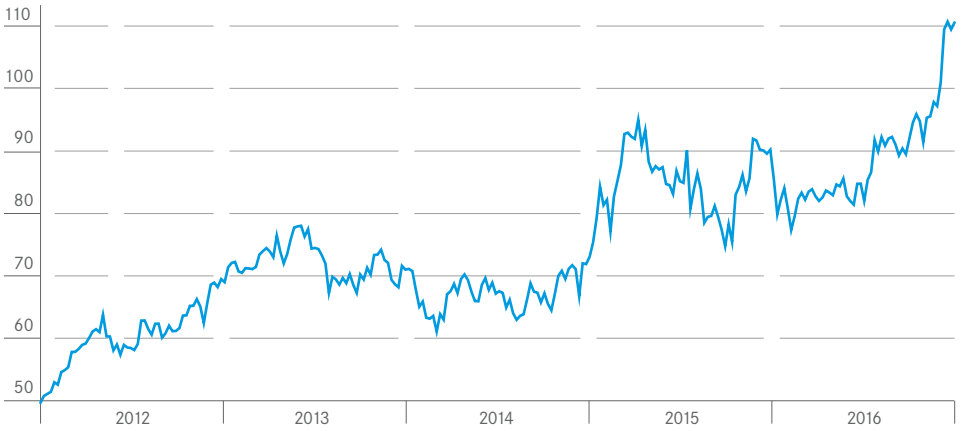
# MTU share information

## 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

| | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| Year-end quoted price | € 68.80 | € 71.39 | € 72.16 | € 90.10 | € 109.80 |
| Annual performance | 39% | 4% | 1% | 25% | 22% |
| Dividend per share | € 1.35 | € 1.35 | € 1.45 | € 1.70 | € 1.90 |



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

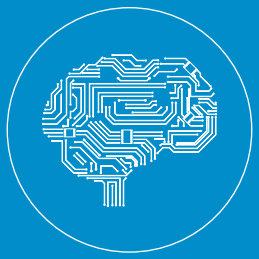
Selected consolidated financial information and key figures at a glance

| in € million (unless stated otherwise) | 2016 | 2015 | Change 2016-2015 in % |
|---|---|---|---|
| **Revenues and earnings** | | | |
| Revenues | 4,732.7 | 4,435.3 | 6.7 |
| attributable to the commercial engine business [1] | 2,401.2 | 2,414.0 | –0.5 |
| attributable to the military engine business [1] | 504.0 | 483.1 | 4.3 |
| attributable to the commercial maintenance business [1] | 1,914.4 | 1,580.6 | 21.1 |
| Gross profit | 657.9 | 580.3 | 13.4 |
| Earnings before interest and tax (EBIT) | 452.8 | 385.6 | 17.4 |
| Earning after tax | 312.6 | 217.6 | 43.7 |
| **Adjusted earnings** | | | |
| Earnings before interest and tax (adjusted EBIT) | 503.0 | 440.3 | 14.2 |
| EBIT margin in % | 10.6 | 9.9 | |
| Earnings after tax | 345.4 | 306.9 | 12.5 |
| **Balance sheet** | | | |
| Total assets | 5,844.6 | 5,188.3 | 12.6 |
| Equity | 1,500.5 | 1,300.6 | 15.4 |
| Equity ratio in % | 25.7 | 25.1 | |
| Net financial debt | 892.0 | 881.2 | 1.2 |
| **Cash flow** | | | |
| Cash flow from operating activities | 358.0 | 296.2 | 20.9 |
| Cash flow from investing activities | –314.0 | –267.8 | –17.3 |
| Free cash flow | 82.0 | 72.0 | 13.9 |
| Cash flow from financing activities | 223.3 | –42.7 | >100 |
| **Number of employees at year end** | | | |
| Commercial and military engine business | 5,374 | 5,331 | 0.8 |
| Commercial maintenance business | 2,994 | 3,003 | –0.3 |
| Total number of employees | 8,368 | 8,334 | 0.4 |
| **Share indicators** | | | |
| Earnings per share in € | | | |
| Undiluted earnings per share | 6.09 | 4.26 | 43.0 |
| Diluted earnings per share | 5.83 | 4.26 | 36.9 |
| Dividend per share in € [2] | 1.90 | 1.70 | 11.8 |
| Dividend yield in % | 1.7 | 1.9 | |
| Total dividend [2] | 97.6 | 86.9 | 12.3 |
| Outstanding common stock at Dec. 31 (million shares) | 51.4 | 51.1 | 0.5 |

[1] Before consolidation

[2] Proposal to the Annual General Meeting for 2016 based on an expected volume of 51.4 million dividend-entitled shares. Prior year: Resolution by the Annual General Meeting for the financial year.

# Table of contents



# MTU 4.0

New markets, new business models, new technologies: the fourth industrial revolution opens up new opportunities across all sectors of the economy. The key issue is digitalization – and the creation of fully integrated and connected supply chains. This allows companies to speed up processes, increase efficiency, reduce the consumption of resources and make working life easier.

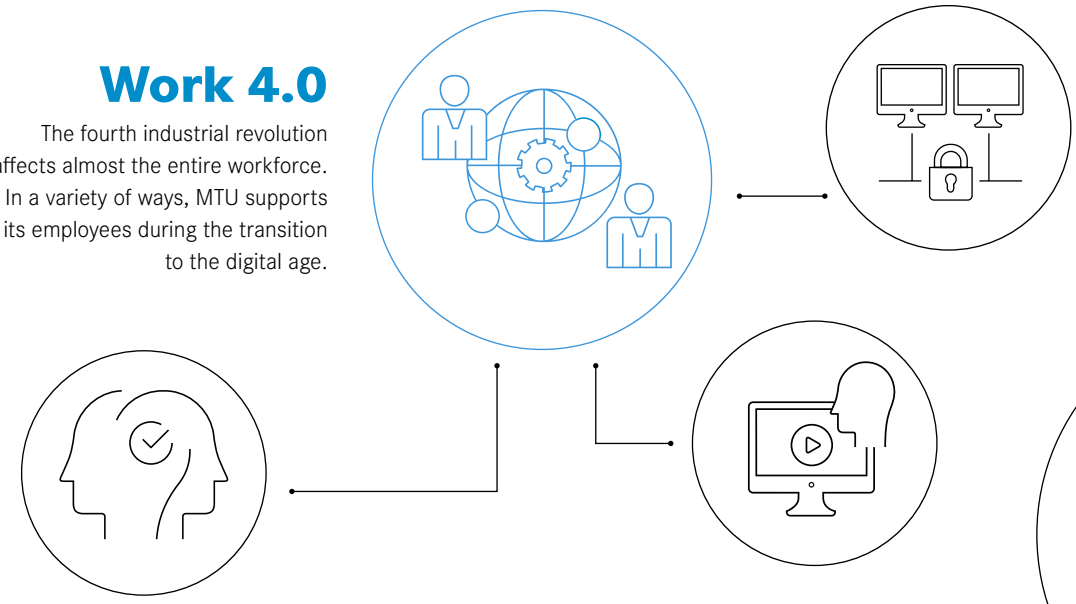
MTU has been a technological leader in the aviation sector for decades. Because the company embraced the opportunities and challenges of digital technologies from an early stage, digitalization is now a living, breathing practice in all business units. Step by step, the company is being transformed into MTU 4.0, Germany's leading engine manufacturer in the digital age.

4.0

# MTU 4.0

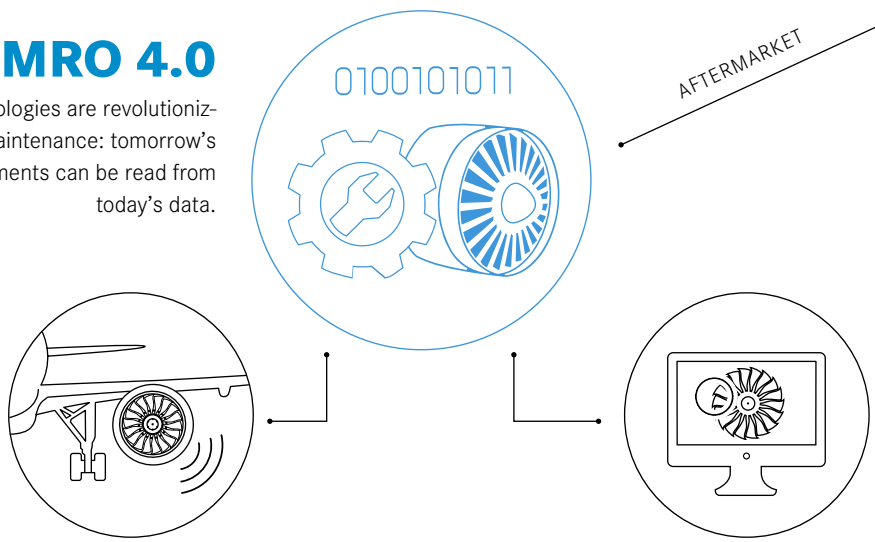
## Work 4.0

The fourth industrial revolution affects almost the entire workforce. In a variety of ways, MTU supports its employees during the transition to the digital age.



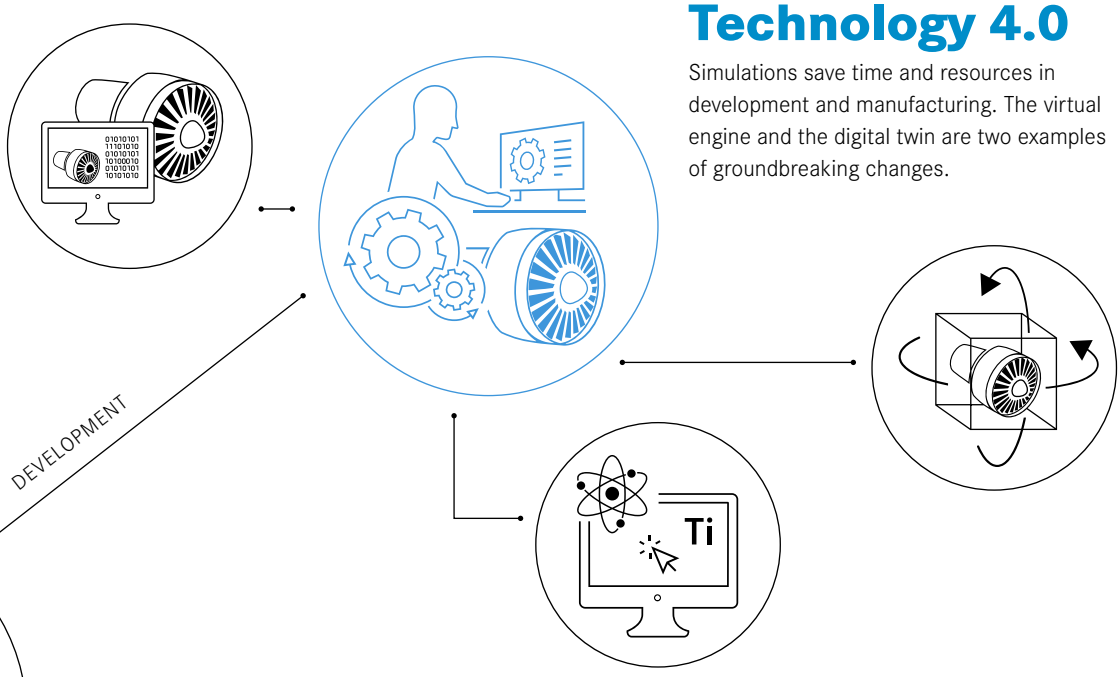
## MRO 4.0

Digital technologies are revolutionizing engine maintenance: tomorrow's MRO requirements can be read from today's data.



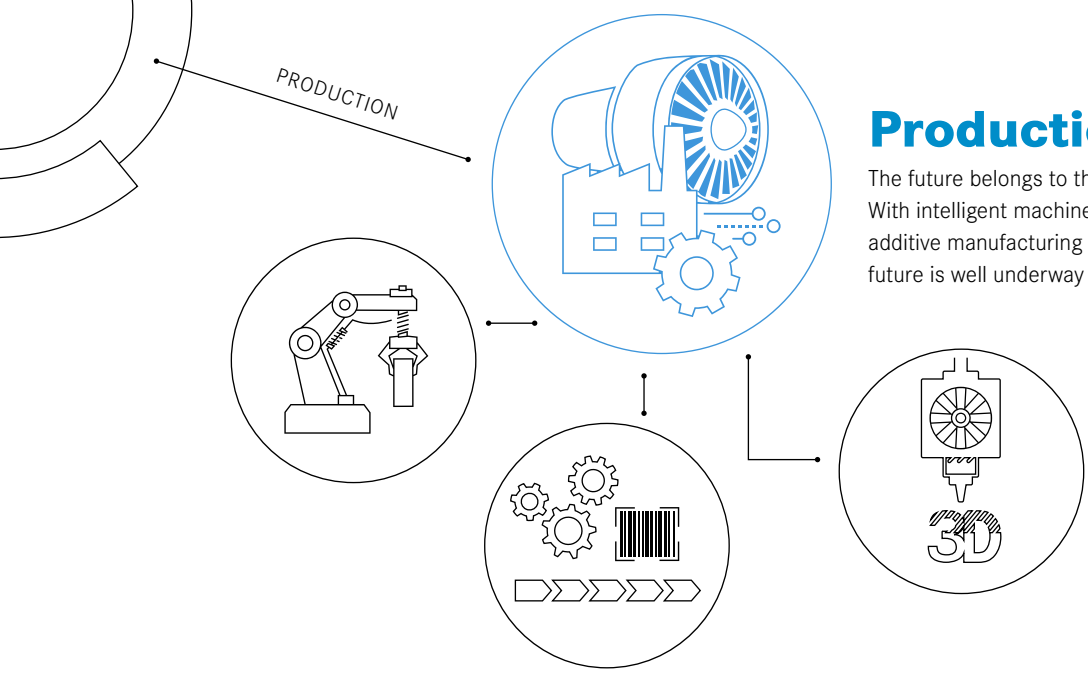
# Technology 4.0

Simulations save time and resources in development and manufacturing. The virtual engine and the digital twin are two examples of groundbreaking changes.




# Production 4.0

The future belongs to the digital factory. With intelligent machine control and additive manufacturing techniques, the future is well underway at MTU.



# Technology 4.0

Even in the digital age, real aircraft will be borne aloft by real engines. However, engine development is shifting increasingly to the virtual world. Today, MTU already uses comprehensive simulations – across the entire process chain. This allows the company to decisively accelerate the time from the design and development of an engine through to its manufacture and market launch. The reason is clear: there is no longer any need to construct elaborate, costly and time-consuming test objects and to carry out expensive validation tests. Instead, employees can create designs on computers and simulate experiments and tests – and thereby find the optimum results at reduced cost and effort.

At this point, the concept of the digital twin also comes into play. This refers to a digital counterpart of the real product, which permits the virtual simulation of product characteristics in all phases of the development process. With digital optimization techniques such as this, MTU can find ideal solutions.

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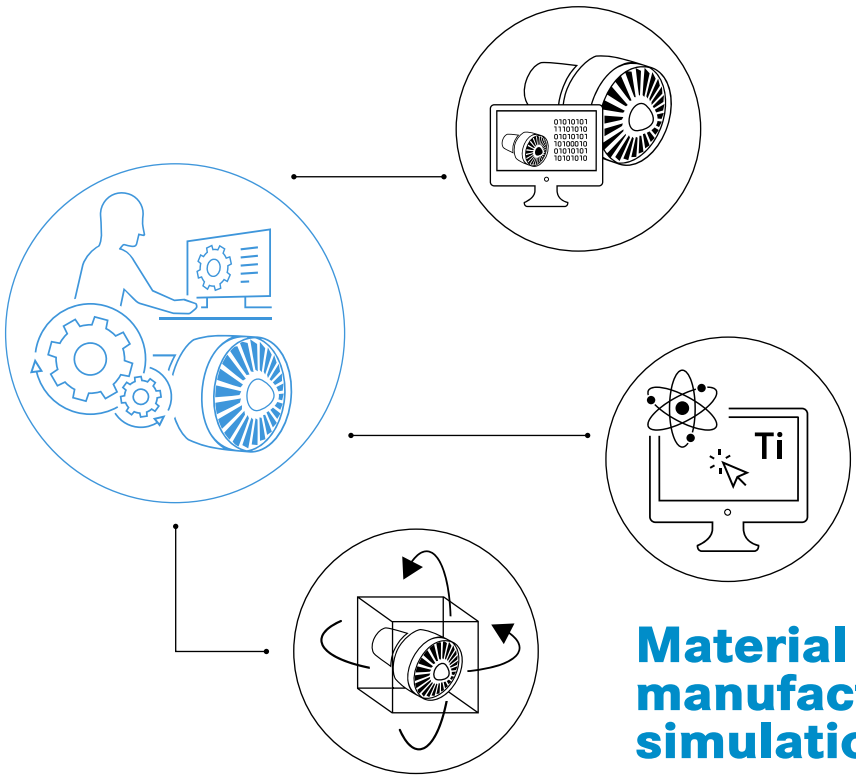
## Digital twin

A product's digital counterpart pools together all important information and is fed by data from the real world. This enables efficient optimization.

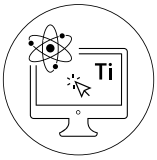



## Material & manufacturing simulation

Simulations make it possible to achieve considerable savings in the development and testing of new materials and manufacturing techniques.

## Virtual engine

Virtual engine simulations are used to make engines more eco-efficient and bring them to market faster.

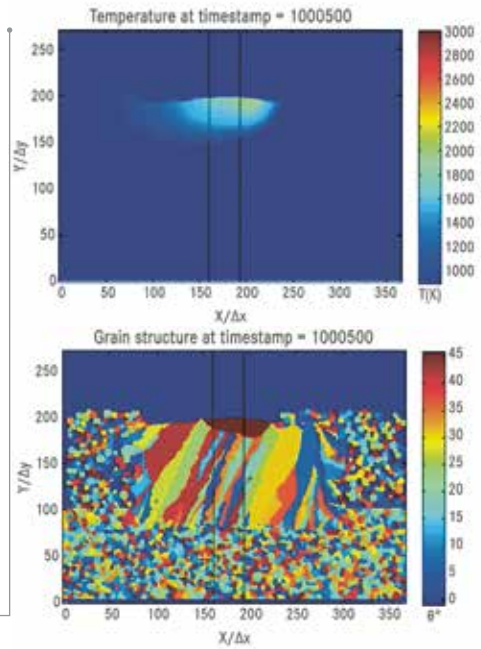



# Simulation

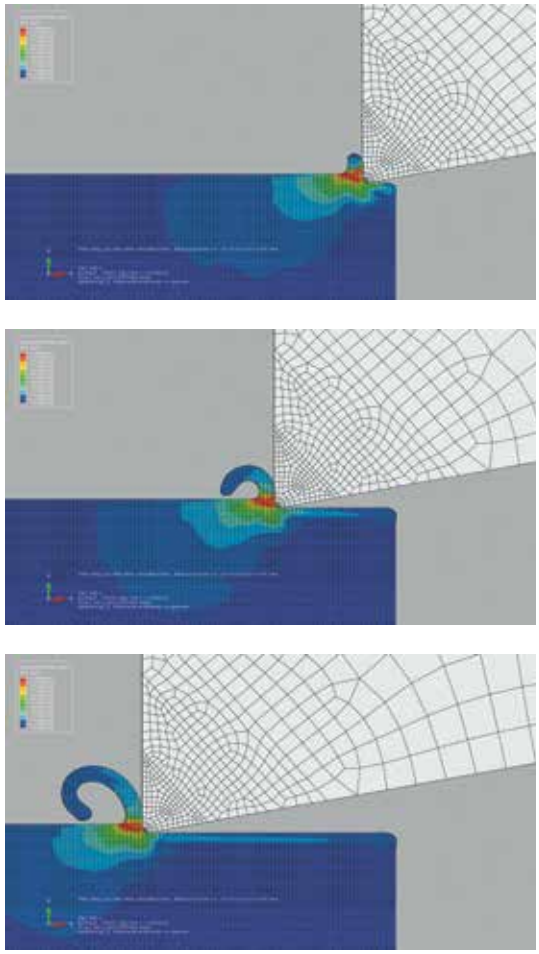
Intelligent simulations at the click of a mouse are already a reality at MTU.

An important approach is called ICM²E, which stands for Integrated Computational Materials and Manufacturing Engineering. The goal of ICM²E is to link together individual simulations and synchronize all parameters – from materials development and across the entire production process – so that the company ends up with a component that has precisely the required characteristics.

MTU's experts are using this innovative method, for example, to simulate on the computer screen the influence of physical parameters on material characteristics. In this way, developers determined the optimum machine settings for the additive manufacturing of borescope eyepieces. MTU is already making these components in series production for the A320neo's PW1100G-JM engine.




*A mixing test used in development simulation allows MTU to test the homogeneity of the elements in the metal of an additively manufactured component.*



*Glimpse into the future: the manufacture of the next engine generation will be supported and optimized by simulation techniques. The example here shows the simulation of a machining process: the tool produces swarf as it cuts through the material from right to left.*

Using integrated simulations, it is also possible to calculate the production lead time, identify potential savings, and optimize machine operating time.

MTU has an ambitious goal of achieving completely simulation-assisted product development. This begins with microscopic material characteristics and encompasses all manufacturing steps all the way through to the finished engine. Once again, this will result in very real engines that will power aircraft around the globe.

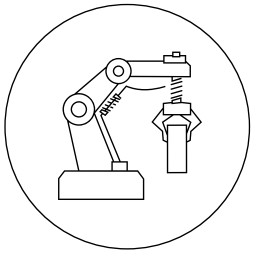
# Production 4.0

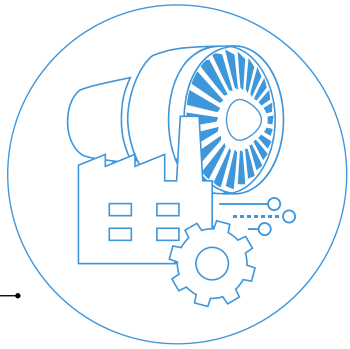
In Production 4.0, products and the means of production are able to communicate and flexibly connect with each other. Cyber-physical systems, as they are known, form the technological basis for this revolution.

These systems enable components to identify themselves by means of various technologies such as RFID. The components know how they should be processed and can make contact with the production system. In turn, the system decides autonomously what is to be done when and in which order.

MTU inaugurated its first semi-automated production lines some years ago. In the production of compressor blisks, it goes one step further: MTU's manufacturing is the most modern in the world for engine parts of this kind. Here, the high-tech components are manufactured with a high degree of automation and an intelligent control system. Digitalization will also feature heavily in manufacturing in the future – although not at any price: after all, engines are not mass products; many parts are still made in piece production.

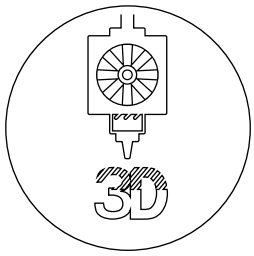
4.0





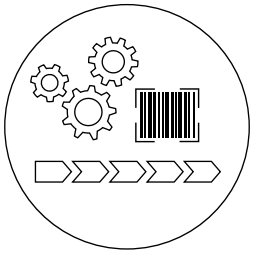
## Intelligent machine control

In its blisk production in Munich, MTU uses intelligent machine control. Processes are largely automated and are digitally controlled.




## Additive manufac-turing

MTU manufactures engine components using additive manufacturing, the industrial 3D printing technology. Machines are controlled directly by the CAD design data.



## Optimized material flow/ Logistics 4.0

MTU is optimizing its logistics processes with an integrated material flow along the value chain. Complete real-time control is planned for the future.

# Digitalized manufacturing

Semi-automated production lines have been everyday reality at MTU for years. The company took a decisive step into the future with the largely self-controlling blisk center of excellence: MTU's blisk production is the most modern manufacturing operation for engine parts of this kind.

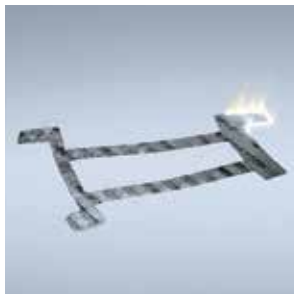
The processes in MTU's blisk production hall are largely automated. At the heart of the innovative manufacturing concept is a 96-meter long, computer-controlled main distribution system. Each component receives an order number and an integrated chip. Using this number, the system calculates the workloads of all the shop's workstations based on the availability of fixtures and tools. The distribution system then sends the components automatically to the respective machines.

*In blisk production, components are fed automatically to the machine; the machine adjusts itself to the component to be processed.*

*Computer-controlled optical measuring systems are used in quality control for blisk manufacturing.*

# Additive manufacturing

Additive manufacturing – or 3D printing – makes it possible to manufacture highly complex components quickly. As a result, it has become firmly established in industrial manufacturing worldwide. MTU Aero Engines is continuously working to improve and further develop the method.



*Because additive manufacturing is fast, cost effective and efficient, manufacturers can achieve significant reductions in throughput times and the costs for blanks.*

*Additively manufactured borescope eyepiece for the A320neo's PW1100G-JM engine.*

MTU has many years of experience in this field, ranks among the top ten patent holders worldwide for the technology, and is a leading innovator in engine construction: it was one of the first companies to manufacture series components using the method – namely, borescope eyepieces for the A320neo's PW1100G-JM engine.

As the next step, MTU wants to develop new lightweight components for manufacture using additive methods, including compressor and turbine blades as well as structural components. The company has prioritized the further development of additive technology in numerous technology projects and programs.

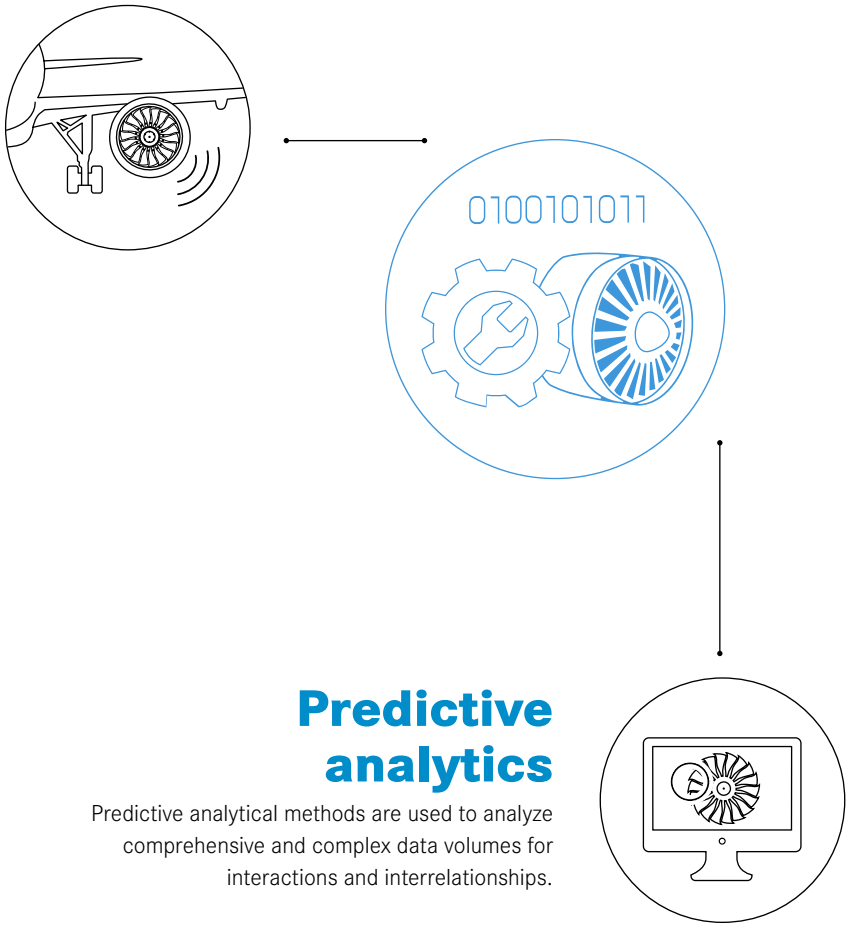
# MRO 4.0

Digitalization is a priority not only in development and production, but also in the maintenance of engines. With the support of computers, it is possible to detect technical problems in engines long before they disrupt flight service or create the need for costly, time-consuming repairs.

In the future, advanced analytics and machine learning technologies will make it possible to analyze large volumes of data on an automated basis. This allows precise predictions to be made about the condition of engines from the aircraft's wing, which greatly facilitates the planning and preparation of engine overhauls. Airlines benefit from reduced maintenance costs and an increased on-wing life of their in-service engines.

# Predictive maintenance (ETM)

Using Engine Trend Monitoring, MTU can continuously monitor the condition of engines. Thanks to digital systems, this monitoring is possible even during the flight.




# Predictive analytics

Predictive analytical methods are used to analyze comprehensive and complex data volumes for interactions and interrelationships.

# Predictive maintenance

MTU uses predictive maintenance on an everyday basis. MTU-Plus Engine Trend Monitoring allows airlines to digitally monitor the condition of their engines. Efficiency through early detection is the name of the game.

*The analysis of real-time data makes it possible to monitor engines while in operation. This allows MTU to make very precise predictions about the condition of the engines.*

At the heart of the engine monitoring software developed by MTU are so-called fully thermodynamic models for engine calculation. For many newer engine and aircraft designs, evaluation of the data can even begin during the flight. Trend analyses can be accessed online around the clock and almost in real time. Even more impressive: a single tool is capable of monitoring all engine models in the MTU portfolio, irrespective of the manufacturer.

# Predictive analytics

Technology has reached a point where innovative techniques allow companies to obtain groundbreaking insights from comprehensive and complex data volumes. This is precisely what MTU does. The company's experts identify interactions and extrapolate prediction models for the existing engine portfolio.


*Maintenance – yes or no: in the future, thanks to predictive analytics, deviations will be detected before they disrupt flight service. The airline can take action at an early stage and schedule repairs.*

A maintenance example illustrates the potential: in the future, the systematic linking of component conditions using Engine Trend Monitoring data from flight operation will make it possible to predict and lengthen component service lives.

# Work 4.0

Digitalization is also revolutionizing the world of work: sooner or later, Work 4.0 will become a reality in many workplaces. Highly digitalized workflows should ensure that increasingly flexible and mobile work practices take hold in companies. This will allow them to boost productivity and efficiency and increase transparency in business processes.

This also benefits MTU: the use of modern IT tools improves not only digital communication inside the organization, but also cooperation with partners and suppliers. Here, it is also important to remember to fulfill legal and contractual obligations with respect to providing proof and documentation. In addition, today and in the future, MTU must ensure a high level of IT security – for the protection of the company's know-how and products. Work 4.0 will change how collaboration works at MTU and also affect management behavior.

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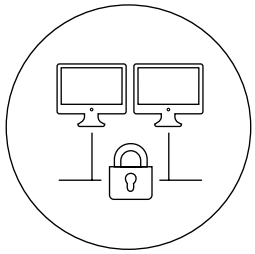
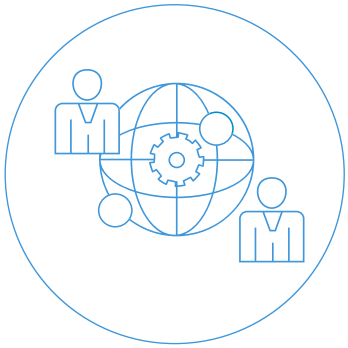
## IT security

In view of increasing connectivity and digital collaboration, MTU is strengthening its security precautions.





## E-learning

In addition to an adaptable, future-ready learning portal, MTU is developing innovative e-learning contents for its employees.

## Collaboration & communication (UCC)

No matter what the medium, the place and the device, MTU is seeking to continuously improve digital communication and collaboration.

# Collaboration & communication (UCC)

Working when and where it's practical: this approach can become a reality with Work 4.0. Well, provided that employees have the appropriate tools – from smartphones to the cloud. Because MTU sees the advantages of the digital workplace, it supports the communication and collaboration of its employees through numerous initiatives.

*Not even tools are untouched by digitalization: the right tool improves collaboration and quality.*

In this way, experts can exchange information between different countries, sales representatives can access shared documents, and marketing experts at various MTU sites can work on standardized communications.

MTU has invested in an integrated IT platform that can incorporate new tools for communication and collaboration. The platform facilitates the constant exchange of know-how and has become one of the most important strategic resources in the organization.

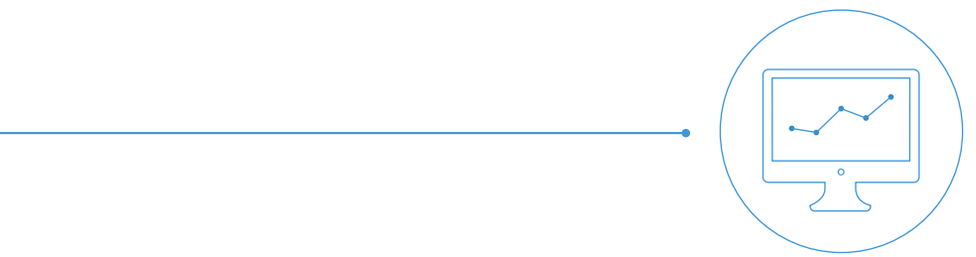
# E-learning

Technological progress calls for a rethink in how work is organized. The concept of lifelong learning is rapidly gaining traction as the half-life of new technologies plummets. MTU is adapting to this demand with a comprehensive e-learning concept.

*Attractive and user-friendly: via adaptable, future-ready learning portals, MTU is providing its employees with Further Education and Training 4.0.*

Employees expect attractive and user-friendly interfaces. This allows them to regularly acquire new specialist knowledge in the workplace – in an easy-to-understand format according to their individual needs and available whenever they have a free hour or two in their diary.

MTU is supporting this development by providing adaptable, future-ready learning portals and innovative e-learning content worldwide, thereby facilitating intuitive learning.



# To our shareholders

# Letter to our shareholders

Dear shareholders,

The fourth industrial revolution is spreading to more and more sectors of the economy – and the aviation sector is no exception. To be successful in the age of digitalization, it is no longer sufficient for companies simply to respond to its challenges. Rather, they must play an active role in shaping the market and start working today to develop the technologies, production processes and services of tomorrow. Exploring new directions on the path to MTU's future success is one of our strengths: as a technological leader in the aviation sector, we focus on innovations and cutting-edge technologies. Consequently, at MTU digitalization is not a vague future concept; it is already a living, breathing practice – in all business units from development and production, through to maintenance. With increasing digitalization, our way of working is also changing. Step by step, we are creating MTU 4.0 – Germany's leading engine manufacturer in the digital age.

The success of this development is shown not least by our business figures: in 2016, for the third year in succession, we again generated the best results in the company's history. At € 4.7 billion, revenues reached a new all-time high. Even after raising our earnings forecast twice in the course of the year, we fully met our targets and set new records with adjusted EBIT of € 503 million and adjusted net income of € 345 million.

You as shareholders benefit directly from this positive business development. In the past financial year, our share price went up by around 22 %. What is more, thanks to these good results we are once again in a position to recompense you with an attractive dividend. At the Annual General Meeting on May 4, 2017, we intend to propose an increased dividend of € 1.90 per share.

We would not have been able to set these new records, however, were it not for our dedicated employees across all areas of the company. On behalf of the entire Executive Board, I would therefore like to take this opportunity to express my warmest thanks to every one of MTU's 8,368 employees. It is their exceptional commitment to MTU that has made our success possible in the first place. We will continue to successfully shape our company's future together moving forward and take on the new challenges along the way.

One main focus of attention will continue to be the geared turbofan (GTF), which enjoys high market demand. By the end of 2016, over 8,000 orders and options had already been placed for the engines of the PurePower® PW1000G family, which is deployed in the aircraft of five different manufacturers.

2016 was a landmark year for the quieter and fuel-saving geared turbofan, starting with its successful market launch on delivery of the first Airbus A320neo to Lufthansa in January. The A320neo powered by PW1100G-JM engines is meanwhile in service with 13 carriers. For MTU, this means that the run-up to series production is now progressing at full pace, after having passed the final decisive milestone in the production ramp-up phase in the financial year under review, namely the inauguration of our PW1100G-JM final assembly line and delivery of the first fully assembled engines. Our Munich location is one of only three facilities worldwide selected for the final assembly and testing of PW1100G-JM engines for the A320neo, and will be responsible for almost one third of these engines.

With the PW1500G for the Bombardier C Series, a second model in the GTF family went into service with a customer in 2016: since July, Swiss has flown the C Series in regular commercial service. In December, Air Baltic also began operating flights with the larger C Series model, the CS300.

In addition, the other GTF-family programs also passed a number of milestones in 2016:

In May, the FAA certified the PW1400G-JM engine. This is deployed in the Irkut MS-21, which celebrated its rollout in June.

Also in May, the PW1900G successfully propelled Embraer's E190-E2 on its maiden flight.

Flight testing of the Mitsubishi Regional Jet powered by PW1200G engines is well under way – also in the US.

We also made important progress with the GE9X engine, which will power the Boeing 777X long-haul airliner. MTU is responsible for producing the turbine center frame for this engine, securing the company a very strong position in tomorrow's long-haul engine market. In 2016, the GE9X successfully completed a first series of ground trials and gave a convincing demonstration of its performance capabilities.

The military engine sector celebrated an export success in the period under review when Kuwait signed an order for 28 Eurofighters, which are powered by the EJ200 engine.

Our global MRO locations benefited from high capacity utilization in 2016. However, we have also made preparations for the future. We acquired several new customers, and many of our existing customers – including LATAM Airlines, Garuda Indonesia, Sky Regional Airlines and the IGT customers Rojana Power and Statoil, to mention just a few – again demonstrated their trust in us by renewing their contracts.

Our commercial maintenance business celebrated two anniversaries last year that underscore the success of our airline partnerships: for 15 years now, we have operated MTU Maintenance Zhuhai, the No. 1 engine maintenance provider in China, as a 50/50 joint venture with China Southern. Airfoil Services in Malaysia, a joint venture with Lufthansa Technik, has existed for 25 years. We are continuing to rely on the close collaboration with airlines moving forward: with Lufthansa Technik we intend to set up a joint venture for maintenance of the PW1000G family of geared turbofan engines.

Following this overview, I think I can safely say that we have set the course for MTU's sustained profitable growth. We intend to continue our record performance in 2017, with the MRO operating segment likely to post the strongest growth. We also expect revenues from the series production of commercial engines as well as spare parts sales to increase, while we anticipate a decline in the military engine business. With this, we hope to be able to show you a strong MTU that is well-equipped for the future.

We would not be able to do this without our customers and business partners, whom I wish to thank for their continued support. I would like to thank you, our shareholders, for the confidence you have placed in us. All of us at MTU will devote ourselves to ensuring that MTU remains a valuable investment. We hope you will continue to accompany us on our successful trajectory.

Sincerely yours

Reiner Winkler

# The Executive Board

**Reiner Winkler**

*Chief Executive Officer, Director of Labor Relations*

**Dr. Rainer Martens**

*Member of the Executive Board, Chief Operating Officer*

**Michael Schreyögg**

*Member of the Executive Board, Chief Program Officer*

- Appointed term: to September 30, 2019
- Born 1961
- Degree in business administration
- From May 2005 to December 2013: member of the MTU Executive Board with responsibility for finance, human resources and IT (Director of Labor Relations)
- Member of MTU's executive management since 2001
- Former managing director finance and controlling at TEMIC Telefunken micro-electronic GmbH
- Previous management posts: Daimler-Benz AG, Siemens AG

- Appointed term: to April 14, 2019
- Born 1961
- Doctorate and degree in mechanical engineering
- In present post since April 2006
- Has occupied various key positions in the engine and aircraft production industry over a period spanning more than 20 years
- Previous management posts: Airbus, MTU Aero Engines, CIM-Fabrik Hannover gGmbH

- Appointed term: to June 30, 2021
- Born 1966
- Degree in mechanical engineering
- In present post since July 2013
- Former head of military programs at MTU Aero Engines
- Managed and coordinated numerous programs for many years at MTU Aero Engines, most recently for the TP400-D6 and MTR390 engines

# The MTU share

## Volatile stock market in 2016

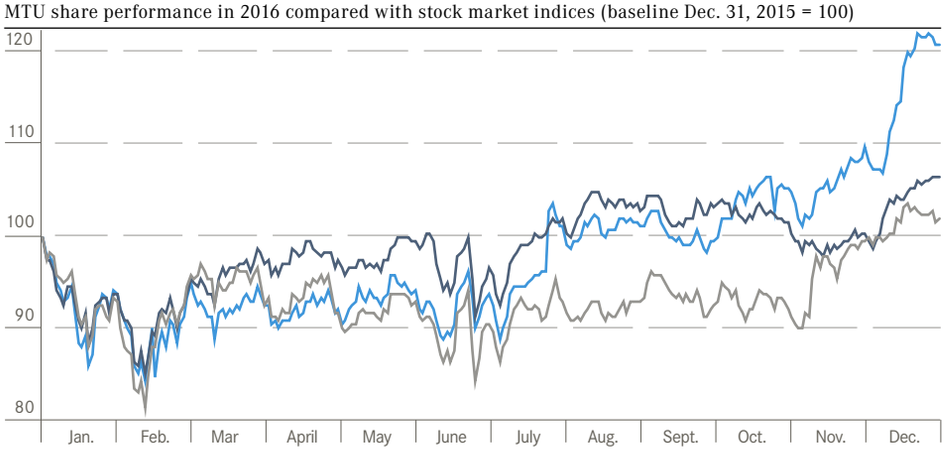
2016 was a highly volatile year on the stock markets, with political factors having a strong influence. In the first months of the year, negative economic data from China and sinking oil prices took their toll, driving the German DAX index to its annual low of 8,753 points in early February. The European Central Bank counteracted this trend with a loose monetary policy. In March, the ECB lowered its base rate to 0% and expanded its bond-buying program. While this initially caused the German benchmark index to recover appreciably, nonetheless it remained highly volatile for the rest of the year. On June 23, Britain voted to leave the European Union. The decision in favor of 'Brexit' also strongly impacted the stock market, and the DAX fell by around 10%, although it recovered again after a few weeks. In the fall, the U.S. presidential elections led to renewed fluctuations in share prices. A more optimistic mood prevailed on the stock market toward the end of the year: on the last trading day in 2016, the DAX closed on 11,481 points – up by 6.9% 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 6.9% in the course of 2016 and closed the year at 22,189 points, its highest level of the year. 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 2.1%.

## MTU share outperforms MDAX

MTU share tops € 100 mark

The MTU share had a capricious start to 2016, with the general climate on the stock exchange leading to a volatile share price development. After hitting its low for the year of € 75.50 on February 11, the MTU share price rose and, until July, moved sideways in a band between € 80 and € 85. Following the announcement of its half-year figures, MTU specified its full-year revenues forecast and upped its earnings forecast slightly. That revived investor confidence in the MTU share, driving the price up significantly to over € 90. MTU raised its earnings forecast for the second time in 2016 on presentation of its interim financial statements for the first nine months. Consequently, the majority of analysts maintained their buy or hold recommendations for the MTU share. Shortly before year end, on December 9, the MTU share price topped the € 100 mark, hitting its all-time high of € 110.95 on December 27, 2016. The MTU share closed out 2016 at € 109.80 after a gain of 21.9%, thus performing notably better than the MDAX.

MTU share performance in 2016 compared with stock market indices (baseline Dec. 31, 2015 = 100)



MTU share indicators year on year

| | | 2016 | 2015 |
|---|---|---|---|
| Highest quoted price[1] | € | 110.95 | 95.55 |
| Lowest quoted price[1] | € | 75.50 | 71.86 |
| Initial quoted price[1] | € | 88.02 | 71.86 |
| Year-end quoted price[1] | € | 109.80 | 90.10 |
| Annual performance[2] | % | +22 | +25 |
| Market capitalization at year end | € million | 5,710 | 4,685 |
| Average daily trading volume | € million<br>in '000 shares | 13<br>149 | 13<br>153 |
| Earnings per share | € | 6.09 | 4.26 |
| Dividend per share | € | 1.90[3] | 1.70 |
| Dividend payout rate[4] | % | 36.0 | 44.5 |
| Dividend yield[5] | % | 1.7 | 1.9 |

[1] Xetra closing price.
[2] Based on Xetra year-end share price (Dec. 31).
[3] Proposal.
[4] Dividend payout as a percentage of net profit available for distribution, according to German GAAP.
[5] Net dividend yield relative to Xetra year-end closing price (Dec. 31).

## Dividend

Proposed dividend
€ 1.90

At the Annual General Meeting to be held on May 4, 2017, the Executive Board and the Supervisory Board intend to propose a dividend payment of € 1.90 per share for the financial year 2016. The dividend for 2015 was € 1.70. MTU thus continues to pursue its earnings-oriented dividend policy. Investors can expect to receive their dividend payment on May 9, 2017. The dividend payout ratio calculated as a percentage of MTU's net profit available for distribution is 36.0%.

## Trading volume

In 2016, the average number of shares that changed hands each day through Xetra trading and the floor trading systems was 149,000, compared with 153,000 shares per day in 2015. The maximum number of shares traded was 631,519 on February 16, 2016.

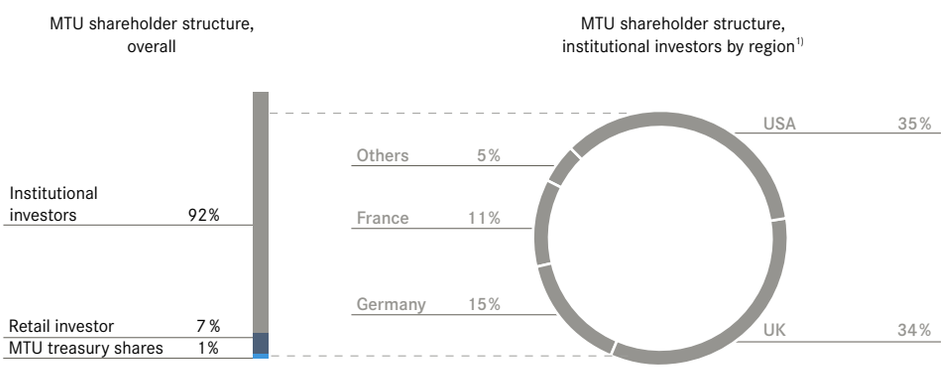
In monetary terms, the daily trading volume amounted to around € 13 million (2015: € 13 million), placing MTU 17th in the ranking of MDAX companies at the end of 2016 (2015: 18th place). In terms of market capitalization, MTU ranked 9th, with outstanding shares valued at € 5,710 million (2015: 11th place).

## Shareholder structure

At December 31, 2016, 98.8% of MTU shares were in free float and around 1.2% were held by the company as treasury shares. Of the free-floating shares, some 92% were held by institutional investors and 7% by retail investors. The majority of institutional investors are based in the UK, the USA, Germany, and France. At December 31, 2016, 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:

- 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
- Harris Associate L.P., Chicago, USA (5.23%) – notification dated November 23, 2015
- Deutsche Asset & Wealth Management Investment GmbH, Frankfurt, Germany (3.07%) – notification dated November 3, 2015
- Capital Research and Management Company, The Capital Group Companies, Los Angeles, USA (9.94%) – notification dated May 22, 2015
- Oddo Asset Management, Oddo et Cie, Paris, France (3.03%) – notification dated March 23, 2015
- Sun Life, Toronto, Canada (5.77%) – notification dated December 6, 2013

Shareholder structure




[1] Approximation based on top 50 shareholders.
Source: SID, August 2016.

## Analysts

As of the end of December 2016, 29 analysts were reporting regularly on MTU. Buy recommendations were issued by 14 of these financial institutions, while 11 gave the MTU stock a hold rating and 4 recommended selling (2015: 9 “buy”, 11 “hold”, 6 “sell”). The average upside target was € 104.

The following financial institutions report regularly on MTU:

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

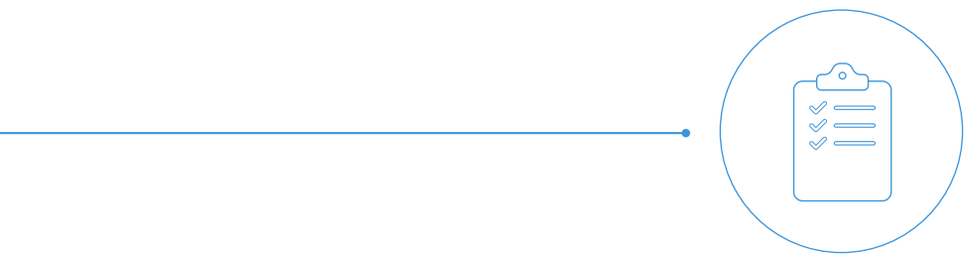
## Investor relations activities

Face-to-face contact with 900 investors

With 23 roadshows in all the key financial centers of Europe and the USA, and a number of secondary financial markets, MTU continued to raise its market profile in 2016. The company also took part in 18 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 900 investors made use of these opportunities for face-to-face contact with MTU in 2016. A key platform for dialog with shareholders was the MTU Annual General Meeting held in Munich on April 14, 2016. It was attended by shareholders representing around 65% of the share capital with voting rights (2015: 54%). Topics such as the strategic orientation of MTU’s partnerships with regard to market access, competitiveness, technology leadership and a balanced product portfolio were focused at its annual Investor and Analyst Day, which was held in Rzeszów, Poland, on December 14, 2016. The company’s medium- to long-term growth prospects also played a key role. Around 40 analysts and investors attended the event in Poland and engaged in lively discussions with the Executive Board on topics of interest.

In 2016, MTU’s Annual Report garnered 10th place for MDAX companies in Bilanz magazine’s “Best Annual Reports” category.

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.



# 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 is seen as a natural responsibility

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 May 5, 2015.

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 May 5, 2015 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 2016

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

The Executive Board's goal is to create sustainable added value

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 comprises three 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 52. 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

Majority of independent Supervisory Board members

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. The majority of the members of the Supervisory Board may be regarded as independent, thus ensuring that the Executive Board receives independent advice and monitoring.

→ further information on page 57

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 57.

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 2016, 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.

In the financial year 2016, 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.

→ further information on page 38 et. seq.

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 38 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 from January 1, 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 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 has been set at 11% for MTU's sites in Germany. MTU is thus 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 resolved on a target quota for women members on the Executive Board for the period until June 30, 2017: as the current board members' contracts run until 2019 or 2021, as the case may be, the target quota was set at 0%.

Getting more women into management

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 113 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 113 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.

Compliance Board reports directly to the Executive Board

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.

# 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).

At the proposal of the Personnel Committee, the Supervisory Board decides on a system of compensation for the members of the Executive Board, including the main components of their contracts, and reviews this system at regular intervals. In the interests of greater transparency and in accordance with revisions to the GCGC, the Supervisory Board passed a resolution in 2015 to modify the compensation system for members of the Executive Board as of the financial year 2016, because until now it included a relatively low proportion of share-based payments.

Variable compensation including long-term components

The present compensation system is commensurate with market conditions and aligned to the company’s performance. The variable compensation is oriented toward the company’s sustainable and positive development and includes a high proportion of share-based payments.

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.

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.

## Principles of the compensation system for members of the Executive Board

At the proposal of the Personnel Committee, the Supervisory Board determines both the total compensation to be awarded to members of the Executive Board (total target direct compensation) and the composition of this compensation. The total target direct compensation is made up to around 40 % of non-performance-related components, with the remainder being performance-related.

## Non-performance-related components

The non-performance-related components consist of the basic salary (fixed compensation) and other benefits (fringe benefits) that are paid on a monthly basis. Fringe benefits 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 components consist of the Annual Performance Bonus (APB) and the Restricted Stock Plan (RSP).

### Performance-related components without long-term incentive effect

The Annual Performance Bonus (APB) is granted as a performance-related component without long-term incentive effect. It makes up around 40% of the variable portion of the target direct compensation.

The actual amount depends on the results achieved as regards two company performance targets and on the board member's individual performance. The company performance targets consist of the key performance indicators at group level – adjusted EBIT and free cash flow – which are given equal weighting. The targets to be achieved to ensure payment of 100% of the APB are set annually in advance by the Supervisory Board, taking the annual planning figures into account. In addition, an entry threshold below the planned level is set for each performance target; this corresponds to an APB entitlement of 50%. Should this entry threshold not be met, no short-term compensation shall be payable. Similarly, the maximum APB entitlement of 180% is payable if the maximum goal achievement level is reached in respect of the targets set for each of the two performance indicators. Between the entry threshold, the 100% level, and the maximum goal achievement level, the APB entitlement is interpolated using a straight-line method. The effective APB entitlement is calculated on the basis of the arithmetical mean of the levels achieved in respect of the two performance targets. In the case of adjusted EBIT, an entry threshold of 70% and a maximum goal achievement level of 115% were set for 2016. The goal achievement level in respect of free cash flow, on the other hand, was defined in absolute terms, with an entry threshold fixed at a figure of € 30 million below the planned level and the maximum APB entitlement at € 15 million above the target. The Supervisory Board takes each Executive Board member's individual performance into account by decreasing or increasing the APB entitlement by up to 20% (by means of the so-called discretionary factor).

Individual performance taken into account

### Performance-related components with long-term incentive effect

The Restricted Stock Plan (RSP) is awarded initially in the form of a cash settlement, subject to income tax, the full net amount of which the Executive Board member is then obliged to reinvest immediately in MTU shares. These shares must be held for a vesting period of four years.

The value of these RSP shares at the grant date represents around 60% of the variable portion of the total direct target compensation, which is weighted according to a multi-year goal achievement level. The latter is calculated by taking the arithmetical mean of the APB entitlements established for the three financial years preceding the year in which the RSP shares were granted. In the case of a new Executive Board member who has not been in office long enough to enable a multi-year goal achievement level to be established at the RSP grant date, a bonus entitlement of 100% is assumed for the missing years.

# Compensation of individual members of the Executive Board

The members of the Executive Board were awarded the following total compensation – as defined in Section 314 (1) no. 6a of the German Commercial Code (HGB) – for their activities on the board in the financial years 2016 and 2015:

Compensation of individual members of the Executive Board

| | **Reiner Winkler** Chief Executive Officer | | **Dr. Rainer Martens** Chief Operating Officer | |
|---|---|---|---|---|
| Executive Board member | | | | |
| in € | **2016** | 2015 | **2016** | 2015 |
| **Non-performance-related components** | | | | |
| Fixed compensation | 750,000 | 720,000 | 500,004 | 500,004 |
| Fringe benefits[1] | 27,767 | 23,574 | 15,664 | 15,723 |
| **Performance-related components** | | | | |
| without long-term incentive effect (non-deferred)[2] | 830,574 | 460,647 | 476,811 | 319,894 |
| with long-term incentive effect | | | | |
| Deferred APB 2013[3] | | 162,321 | | 146,089 |
| Deferred APB 2014[3] | 309,742 | 343,574 | 205,204 | 227,617 |
| Deferred APB 2015[3] | 354,261 | | 246,014 | |
| RSP 2016[4] | 1,024,974 | | 637,146 | |
| Share-based compensation[5] | | 445,295 | | 309,263 |
| Other[6] | | 231,296 | | 155,192 |
| **Total compensation** | **3,297,318** | **2,386,707** | **2,080,843** | **1,673,782** |

[1] Fringe benefits include charges to taxable income covering personal use of company vehicles amounting to € 63,814 (2015: € 65,098) and premiums for insurance policies taken out on behalf of members of the Executive Board amounting to € 5,407 (2015: € 5,478).

[2] Non-deferred APB for the financial year 2016 (or 2015); to be paid out in 2017 after adoption of the annual financial statements for 2016.

[3] To be paid out in 2017 after the adoption of the annual financial statements for 2016.

[4] Paid out in the current financial year after adoption of the annual financial statements for the previous year.

[5] Fair value at the grant date.

[6] Difference between cash settlement value and cumulated fair value at the grant date of the redeemed share-based payment benefits. In view of the transition to the new system of long-term compensation as of the financial year 2016, the performance shares (tranches 2013-2015) and entitlements granted under the Share Matching Plan (2010-2015) were converted into shares subject to disposal restrictions (2-year vesting period) in 2016.

[7] In the financial year 2015, Dr. Stefan Weingartner additionally received the following compensatory one-time payments: fixed compensation € 278,250, fringe benefits € 16,625, APB € 208,688 and long-term compensation € 208,688.

| **Michael Schreyögg**<br>Chief Program Officer | | **Dr. Stefan Weingartner**[7]<br>**(former Executive Board member)**<br>President MTU Maintenance until March 31, 2015 | | **Total compensation** | |
|---|---|---|---|---|---|
| **2016** | 2015 | **2016** | 2015 | **2016** | 2015 |
| | | | | | |
| 500,004 | 500,004 | | 119,250 | 1,750,008 | 1,839,258 |
| 25,790 | 24,952 | | 6,326 | 69,221 | 70,575 |
| | | | | | |
| 476,811 | 319,894 | | 44,719 | 1,784,196 | 1,145,154 |
| | | | | | |
| | 55,128 | | 85,627 | | 449,165 |
| 180,037 | 199,702 | 133,414 | 133,414 | 828,397 | 904,307 |
| 246,014 | | 22,360 | | 868,649 | |
| 637,146 | | | | 2,299,266 | |
| | 309,263 | | 62,904 | | 1,126,725 |
| | 154,082 | | | | 540,570 |
| **2,065,802** | **1,563,025** | **155,774** | **452,240** | **7,599,737** | **6,075,754** |

# Recommendations of the German Corporate Governance Code (GCGC)

The GCGC determines the compensation components to be disclosed individually for each Executive Board member and recommends the use of the model tables appended to the Code for this purpose. Accordingly, the following table shows the benefits granted for the financial years 2016 and 2015 as well as the minimum and maximum amounts applicable for the financial year 2016 based on the 100% goal achievement.

Benefits granted

| Executive Board member | **Reiner Winkler** Chief Executive Officer | | | |
|---|---|---|---|---|
| Individual items in € | 2016 | 2016 (Min) | 2016 (Max) | 2015 |
| Fixed compensation | 750,000 | 750,000 | 750,000 | 720,000 |
| Fringe benefits[1] | 27,767 | 27,767 | 27,767 | 23,574 |
| **Subtotal** | **777,767** | **777,767** | **777,767** | **743,574** |
| One-year variable compensation | 540,000 | | 1,166,400 | 270,000 |
| Multi-year variable compensation | 740,000 | | 1,332,000 | 715,295 |
| Deferred APB 1 (relating to 2015 and based on the old compensation system) | | | | 135,000 |
| Deferred APB 2 (relating to 2015 and based on the old compensation system) | | | | 135,000 |
| RSP 2016 | 740,000 | | 1,332,000 | |
| Share-based compensation | | | | |
| Performance Share Plan (assessment period: 4 years) | | | | 379,752 |
| Share Matching Plan (option period: 52 months) | | | | 65,543 |
| **Total fixed and variable compensation** | **2,057,767** | **777,767** | **3,276,167** | **1,728,869** |
| Service cost in accordance with IAS 19 | 215,398 | 215,398 | 215,398 | 211,292 |
| **Total compensation (GCGC)** | **2,273,165** | **993,165** | **3,491,565** | **1,940,161** |

[1] Fringe benefits include charges to taxable income covering personal use of company vehicles amounting to €63,814 (2015: €65,098) and premiums for insurance policies taken out on behalf of members of the Executive Board amounting to € 5,407 (2015: € 5,478).

| | **Dr. Rainer Martens**<br>Chief Operating Officer | | | | **Michael Schreyögg**<br>Chief Program Officer | | | |
|---|---|---|---|---|---|---|---|---|
| **2016** | 2016 (Min) | 2016 (Max) | 2015 | **2016** | 2016 (Min) | 2016 (Max) | 2015 |
| 500,004 | 500,004 | 500,004 | 500,004 | 500,004 | 500,004 | 500,004 | 500,004 |
| 15,664 | 15,664 | 15,664 | 15,723 | 25,790 | 25,790 | 25,790 | 24,952 |
| **515,668** | **515,668** | **515,668** | **515,727** | **525,794** | **525,794** | **525,794** | **524,956** |
| 310,000 | | 669,600 | 187,500 | 310,000 | | 669,600 | 187,500 |
| 460,000 | | 828,000 | 496,763 | 460,000 | | 828,000 | 496,763 |
| | | | 93,750 | | | | 93,750 |
| | | | 93,750 | | | | 93,750 |
| 460,000 | | 828,000 | | 460,000 | | 828,000 | |
| | | | | | | | |
| | | | 263,743 | | | | 263,743 |
| | | | 45,520 | | | | 45,520 |
| **1,285,668** | **515,668** | **2,013,268** | **1,199,990** | **1,295,794** | **525,794** | **2,023,394** | **1,209,219** |
| 181,990 | 181,990 | 181,990 | 178,046 | 107,825 | 107,825 | 107,825 | 82,120 |
| **1,467,658** | **697,658** | **2,195,258** | **1,378,036** | **1,403,619** | **633,619** | **2,131,219** | **1,291,339** |

The table below, compiled in accordance with the GCGC recommendations, shows the allocation of fixed and variable compensation for the financial years 2016 and 2015 as well as the service cost (benefit expense) for the pension plan:

Allocation of compensation

| | **Reiner Winkler** Chief Executive Officer | | **Dr. Rainer Martens** Chief Operating Officer | |
|---|---|---|---|---|
| Executive Board member | | | | |
| Individual items in € | **2016** | 2015 | **2016** | 2015 |
| Fixed compensation | 750,000 | 720,000 | 500,004 | 500,004 |
| Fringe benefits[1] | 27,767 | 23,574 | 15,664 | 15,723 |
| **Subtotal** | **777,767** | **743,574** | **515,668** | **515,727** |
| One-year variable compensation | 830,574 | 460,647 | 476,811 | 319,894 |
| Multi-year variable compensation | 3,804,690 | 898,693 | 2,739,743 | 727,239 |
| Deferred APB 1 (relating to 2015 and 2014 and based on the old compensation system) | 354,261 | 343,574 | 246,014 | 227,617 |
| Deferred APB 2 (relating to 2014 and 2013 and based on the old compensation system) | 309,742 | 162,321 | 205,204 | 146,089 |
| RSP 2016 | 1,024,974 | | 637,146 | |
| Share-based compensation | | | | |
| Performance Share Plan 2011-2014[2] | | 392,798 | | 353,533 |
| Performance Share Plan 2012-2015 | 525,921 | | 473,354 | |
| Cash settlement for PSP, SMP | 1,589,792 | | 1,178,025 | |
| **Total fixed and variable compensation** | **5,413,031** | **2,102,914** | **3,732,222** | **1,562,860** |
| Service cost in accordance with IAS 19 | 215,398 | 211,292 | 181,990 | 178,046 |
| **Total compensation (GCGC)** | **5,628,429** | **2,314,206** | **3,914,212** | **1,740,906** |

[1] Fringe benefits include charges to taxable income covering personal use of company vehicles amounting to € 63,814 (2015: € 65,098) and premiums for insurance policies taken out on behalf of members of the Executive Board amounting to € 5,407 (2015: € 5,478).

[2] In the financial year 2015, when he ceased to be a member of the Executive Board, Dr. Stefan Weingartner was awarded a cash settlement corresponding to the total value of all performance shares granted to him in 2012-2015.

[3] In the financial year 2015, Dr. Stefan Weingartner additionally received the following compensatory one-time payments: fixed compensation € 278,250, fringe benefits € 16,625, APB € 208,688 and long-term compensation € 208,688.

| **Michael Schreyögg**<br>Chief Program Officer | | **Dr. Stefan Weingartner**[3]<br>**(former Executive Board member)**<br>President MTU Maintenance until March 31, 2015 | |
|---|---|---|---|
| **2016** | 2015 | **2016** | 2015 |
| 500,004 | 500,004 | | 119,250 |
| 25,790 | 24,952 | | 6,326 |
| **525,794** | **524,956** | | **125,576** |
| 476,811 | 319,894 | | 44,719 |
| 1,899,394 | 254,830 | 155,774 | 2,273,264 |
| 246,014 | 199,702 | 22,360 | 133,414 |
| 180,037 | 55,128 | 133,414 | 85,627 |
| 637,146 | | | |
| | | | |
| | | | 2,054,223 |
| | | | |
| 836,197 | | | |
| **2,901,999** | **1,099,680** | **155,774** | **2,443,559** |
| 107,825 | 82,120 | | 210,815 |
| **3,009,824** | **1,181,800** | **155,774** | **2,654,374** |

# Performance-related components

## Annual Performance Bonus (APB)

As of 2016, beneficiaries receive the Annual Performance Bonus in a single payment as a short-term compensation component. The performance targets set by the Supervisory Board for the 2016 Annual Performance Bonus (APB) were “adjusted EBIT” with a target of € 465.0 million (actual adjusted EBIT in 2016: € 503.0 million) and “free cash flow” with a target of € 70.0 million (actual free cash flow in 2016: € 82.0 million).

Until the financial year 2015, one half of the APB was paid as a short-term component in the calendar year following the financial year in which it was awarded. The remaining 50% of the APB was deferred and paid out in two equal portions over the following two financial years. The ultimate amount of the deferred APB depended on the goal achievement level attained in respect of the two key performance indicators at group level, and on the discretionary factor applied in the respective financial years prior to the payment.

Notwithstanding the modified APB as of the financial year 2016, the remaining deferred APB components for 2014 and 2015 will continue to run until payment is due, adjusted accordingly to the respective goal achievement level. In the case of former Executive Board member Dr. Stefan Weingartner, his deferred APB entitlement for 2013 to 2015 was based not on the goal achievement level in the respective financial year, but rather on a goal achievement level of 100% and a discretionary factor of one (1).

## Restricted Stock Plan (RSP)

As of the financial year 2016, the Restricted Stock Plan (RSP) replaces the previously awarded performance-related components with long-term incentive effect, consisting of the Performance Share Plan (PSP) and the Share Matching Plan (SMP). As a transitional arrangement, active members of the Executive Board were granted a one-time cash settlement corresponding to the fair value of the granted but not-yet-exercisable tranches of PSP and SMP shares, with the obligation of immediately converting the net proceeds into MTU shares with disposal restrictions. Former Executive Board member Dr. Stefan Weingartner retains his right to 1,506 free shares at the end of the three-year vesting period for the MTU shares he purchased in 2014 under the terms of the SMP.

The multi-year goal achievement level used to weight the value of RSP shares at the grant date in 2016 is calculated by averaging the Annual Performance Bonus (APB) entitlements established for the financial years 2013, 2014 and 2015.

# 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 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 with the approval of the company, 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, Dr. Rainer Martens, and Dr. Stefan Weingartner 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 | Oct. 1, 2019 | 7,744,205 |
| Dr. Rainer Martens | 1,366,176 | 2,317,650 | 220,000 | Apr. 1, 2021 | 5,293,176 |
| Michael Schreyögg | 365,627 | 365,627 | 215,478 | Aug. 1, 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.

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 2016 and 2015, 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** | **2016** | **215,398** | **195,610** | **6,447,991** | **5,606,825** |
| | 2015 | 211,292 | 180,513 | 5,891,528 | 5,267,473 |
| **Dr. Rainer Martens** | **2016** | **181,990** | **168,116** | **4,786,287** | **4,220,570** |
| | 2015 | 178,046 | 156,217 | 4,369,536 | 3,943,316 |
| **Michael Schreyögg** | **2016** | **107,825** | **90,264** | **3,241,263** | **2,502,890** |
| | 2015 | 82,120 | 61,774 | 2,861,629 | 2,358,717 |
| **Total** | **2016** | **505,213** | **453,990** | **14,475,541** | **12,330,285** |
| **Total** | **2015** | **471,458** | **398,504** | **13,122,693** | **11,569,506** |

The pension obligations toward former members of the Executive Board in accordance with International Accounting Standards (DBO) amounted to € 8,039,606 (2015: € 7,167,081).

## 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 Boards

Capped severance payments

Under the modified terms of the Executive Board compensation system implemented as of the financial year 2016, 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, APB entitlement, and long-term RSP benefits covering the period up to the date on which his/her contract would normally have expired. When calculating the amount of the severance payment, a bonus entitlement of 100% is assumed for the APB and RSP benefits that would have otherwise been awarded for the financial years within this period. The total amount of the severance payment is capped at twice the departing board member's annual target direct 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.

## 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 alone 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/her duties and responsibilities significantly change or if the Executive Board member is asked to agree to a reduction in salary or premature termination of their 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 their contract would normally have expired. When calculating the amount of the severance payment, a goal achievement level of 100% is assumed for the variable compensation components. The total amount of the severance payment is capped at three times the departing board member's annual target direct 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 2016 and 2015 respectively.

Supervisory Board compensation

| in € | 2016[1] | | | | 2015[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 | 24,000.00 | 224,000.00 | 150,000.00 | 50,000.00 | 27,000.00 | 227,000.00 |
| Josef Mailer (Supervisory Board deputy chairman since Oct. 15, 2015) [2] [3] [5] | 75,000.00 | 20,000.00 | 24,000.00 | 119,000.00 | 15,833.33 | 4,222.22 | 6,000.00 | 26,055.55 |
| Josef Hillreiner (Supervisory Board deputy chairman until Oct. 14, 2015) [2] [3] [5] | | | | 0.00 | 59,166.67 | 15,777.78 | 24,000.00 | 98,944.45 |
| Dr. Joachim Rauhut (Audit Committee chairman) | 50,000.00 | 30,000.00 | 24,000.00 | 104,000.00 | 50,000.00 | 30,000.00 | 27,000.00 | 107,000.00 |
| Thomas Bauer (since November 1, 2015) | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 | 8,333.33 | 0.00 | 3,000.00 | 11,333.33 |
| Michael Behé [5] | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 |
| Dr. Wilhelm Bender | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 |
| Thomas Dautl | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 |
| Babette Fröhlich (until April 14, 2016) [3] [5] | 14,444.44 | 2,888.89 | 9,000.00 | 26,333.33 | 50,000.00 | 10,000.00 | 24,000.00 | 84,000.00 |
| Berthold Fuchs (until October 31, 2015) | | | | 0.00 | 41,666.67 | 0.00 | 12,000.00 | 53,666.67 |
| 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 | 18,000.00 | 88,000.00 |
| Dr. Martin Kimmich [2] [5] | 50,000.00 | 10,000.00 | 15,000.00 | 75,000.00 | 50,000.00 | 10,000.00 | 18,000.00 | 78,000.00 |
| Heike Mandan (since April 15, 2016) [3] [5] | 35,555.56 | 7,111.11 | 12,000.00 | 54,666.67 | 0.00 | 0.00 | 0.00 | 0.00 |
| Prof. Dr.-Ing. Klaus Steffens | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 |
| Prof. Dr. Marion A. Weissenberger-Eibl | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 | 50,000.00 | 0.00 | 15,000.00 | 65,000.00 |
| **Total** | **725,000.00** | **140,000.00** | **213,000.00** | **1,078,000.00** | **725,000.00** | **140,000.00** | **234,000.00** | **1,099,000.00** |

[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.

# 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 2016 and on the results of its review of the annual financial statements and consolidated financial statements. In 2016, 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 2016, 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 2016, 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 Su-

pervisory Board and of the committees of which they are members. The attendance rate was 100%. 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 issue of a convertible bond was also dealt with in depth. Another topic on the agenda was the establishment of a joint venture for the maintenance of geared turbofan engines. Apart from its participation in engine leasing companies, the Supervisory Board further discussed the assumption of a guarantee to cover the company's extended credit line.

Other topics of discussion in the year under review were support to finance the purchase of aircraft and engines and technical compliance at MTU. At its meetings, the Supervisory Board also discussed the status of the engine programs for the PW1100G-JM, which powers the Airbus A320neo, and the TP400-D6 engine program for the Airbus A400M military transporter.

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 2016. The Annual General Meeting approved this proposal by a majority of 99.0%.

Other issues closely examined by the Supervisory Board were the operational business plans and the budget for 2017, the annual performance bonuses for the Executive Board for 2015 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 2016, 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 2016.

The Supervisory Board has a sufficient number of independent members; indeed, they make up the majority of this body. Its members 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 2016. 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 6, 2016, 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 32 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 did not meet in the financial year 2016. 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 and Dr. Jürgen M. Geißinger.

The Personnel Committee comprises Klaus Eberhardt, Dr. Jürgen M. Geißinger and the two employee representatives Josef Mailer and Dr. Martin Kimmich. The Personnel Committee convened twice in 2016, discussing among other things the reults of the Supervisory Board's efficiency audit, the D & O liability insurance for the Executive Board, the annual performance bonuses of the Executive Board for 2015 and set the goals for the annual performance bonuses for 2016.

The Mediation Committee, whose members are identical with those of the Personnel Committee, did not have to convene in 2016.

The members of the Audit Committee are Dr. Joachim Rauhut, Klaus Eberhardt, Josef Mailer, Babette Fröhlich (until April 14, 2016) and Heike Madan (since April 15, 2016). The Audit Committee convened five times in 2016 and held two conference calls. 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 2016 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 review carried out by the Audit Committee, the issue of a convertible bond, aircraft financing, the EU Audit Reform rules, MTU's IT security and the new rules governing Corporate Responsibility reporting.

## 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 2016 were audited and fully certified by the accounting firm Ernst & Young, Munich, whose appointment had been confirmed by the Annual General Meeting. The responsible auditors were Siegfried Keller and Marcus Westermeier, who have audited MTU since 2014. 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 of the MTU group and MTU Aero Engines AG for 2016 and the Executive Board's profit distribution proposal on the basis of Ernst & Young's preliminary audit, on which the chair of the Audit Committee had presented a full report to the Supervisory Board.

The auditor attended the meeting of the Audit Committee of MTU Aero Engines AG on March 7, 2017, and the balance sheet meeting of the Supervisory Board on March 14, 2017, and presented the main findings of the audit. The Supervisory Board reviewed the annual financial statements, consolidated financial statements, combined management report, 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 2016 as submitted by the Executive Board were approved at the Supervisory Board meeting on March 14, 2017. 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.

## Boardroom changes

Heike Madan joined the Supervisory Board on April 15, 2016, succeeding Babette Fröhlich, who stepped down from that body with effect from April 14, 2016. Heike Madan also succeeds Babette Fröhlich as a member of the Audit Committee. The members of the Supervisory Board wish to thank Babette Fröhlich for her long years of dedicated, professional work on the MTU Supervisory Board. The Supervisory Board also thanks the 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 2016. 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, March 14, 2017

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
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 (since July 5, 2016)
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*

**Babette Fröhlich (until April 14, 2016)**
*Strategic and Policy Planning, IG Metall, Frankfurt/Main*
Volkswagen AG (until May 31, 2016)

**Dr.-Ing. Jürgen M. Geißinger**
*CEO of Senvion GmbH, Hamburg*
Hilotherm Holding AG (Switzerland)
Sandvik AB (Sweden)

**Dr. Martin Kimmich**
*Second authorized representative of IG Metall, Munich*
Linde AG
Nokia Solutions and Networks Management GmbH

**Heike Madan (since April 15, 2016)**
*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 (since May 10, 2016)

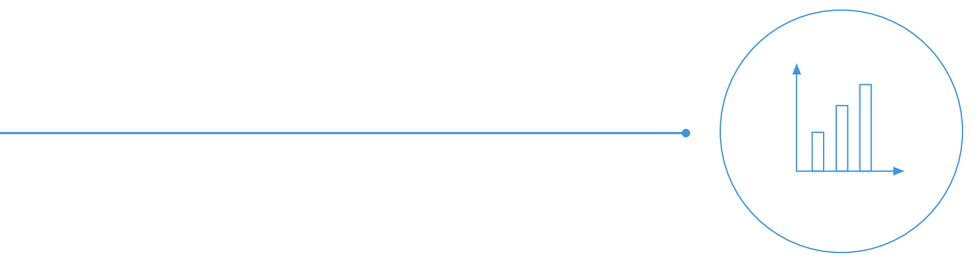
## SUPERVISORY BOARD COMMITTEES

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

**Audit Committee**
Dr. Joachim Rauhut, Chairman
Klaus Eberhardt
Babette Fröhlich (until April 14, 2016)
Heike Madan (since April 15, 2016)
Josef Mailer

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

**Nomination Committee**
Klaus Eberhardt
Dr.-Ing. Jürgen M. Geißinger



# 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 2016 have been combined in accordance with Section 315 (3) in conjunction with Section 298 (2) of the German Commercial Code (HGB).

# The enterprise MTU

## Business activities and markets

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.

Key partner in all programs of note

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 148

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)] Major joint ventures.

# Corporate strategy and objectives

In line with its mission to create value for customers, business partners and shareholders, MTU develops and sells technologically advanced, high-quality engines, engine modules and services for military and commercial applications.

## The overriding goal: profitable growth

MTU's corporate strategy is geared to profitable growth. The three pillars of this growth strategy are:

**Cutting-edge technologies**
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, the goal being to achieve even greater efficiency in the medium term with its core modules – the low-pressure turbine, high-pressure compressor and turbine center frame – and thus greater profitability and environmental friendliness, while simultaneously reducing component weight. Going forward, MTU will continue to make targeted investments in cutting-edge products and processes, thus further enhancing its position as technology leader.

**A balanced product portfolio**

Participation in rapidly growing programs

MTU Aero Engines participates in rapidly growing and high-volume military and commercial engine applications, working with various partners in doing so. It optimizes its risk profile and growth opportunities through continuous participation in programs with varying thrust classes and fields of application. In addition to managing ongoing programs, MTU Aero Engines is currently also focusing on ramping up the program for geared turbofan™ engines for regional and medium-haul jets, which it has developed together with partners. In addition to launching and refining the geared turbofan™, the focus of the MTU participations lies on future engines for widebody aircraft, such as GE's GE9X, for which the market launch is scheduled for 2020. In the medium term, MTU's MRO segment will also benefit from the market success of these engines as the company has secured itself a corresponding share in the future aftermarket service business through its stakes in the engine programs.

**Enhanced competitiveness**
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. In addition to saving costs and reducing working capital, the goal is to continue improving quality and throughput times.

## Skilled, motivated employees – the basis for success

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

MTU is confident that it will achieve its profitable-growth objectives thanks to its extensive investments and efficiency programs.

# Group internal control system

KPI-based management

MTU is managed with reference to the key performance indicators adopted by the Executive Board. These key performance indicators (KPIs) are derived from the operational business plans and provide the underpinnings for a method of corporate management that is directed toward 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: revenues and adjusted EBIT

| | | | Change 2016 - 2015 | |
|---|---|---|---|---|
| in € million | 2016 | 2015 | in € million | in % |
| Revenues | 4,732.7 | 4,435.3 | 297.4 | 6.7 |
| Adjusted EBIT | 503.0 | 440.3 | 62.7 | 14.2 |
| Adjusted EBIT margin (in %) | 10.6 | 9.9 | | |

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 adjusted EBIT, which is the most important of these KPIs. Another indicator monitored by the company is the adjusted EBIT margin, which expresses the relationship between adjusted EBIT 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 the acquisition payments for shares in engine programs, payments in connection with interest-bearing loans related to aircraft and engine financing agreements, and financial assets held for the purpose of liquidity management.

Free cash flow

| | | | Change 2016 - 2015 | |
|---|---|---|---|---|
| in € million | 2016 | 2015 | in € million | in % |
| Cash flow from operating activities | 358.0 | 296.2 | 61.8 | 20.9 |
| Cash flow from investing activities | –314.0 | –267.8 | –46.2 | –17.3 |
| Non-recurring cash outflows | 38.0 | 43.6 | –5.6 | –12.8 |
| **Free cash flow** | **82.0** | **72.0** | **10.0** | **13.9** |

# 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

## Reducing fuel consumption and emissions

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. 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.

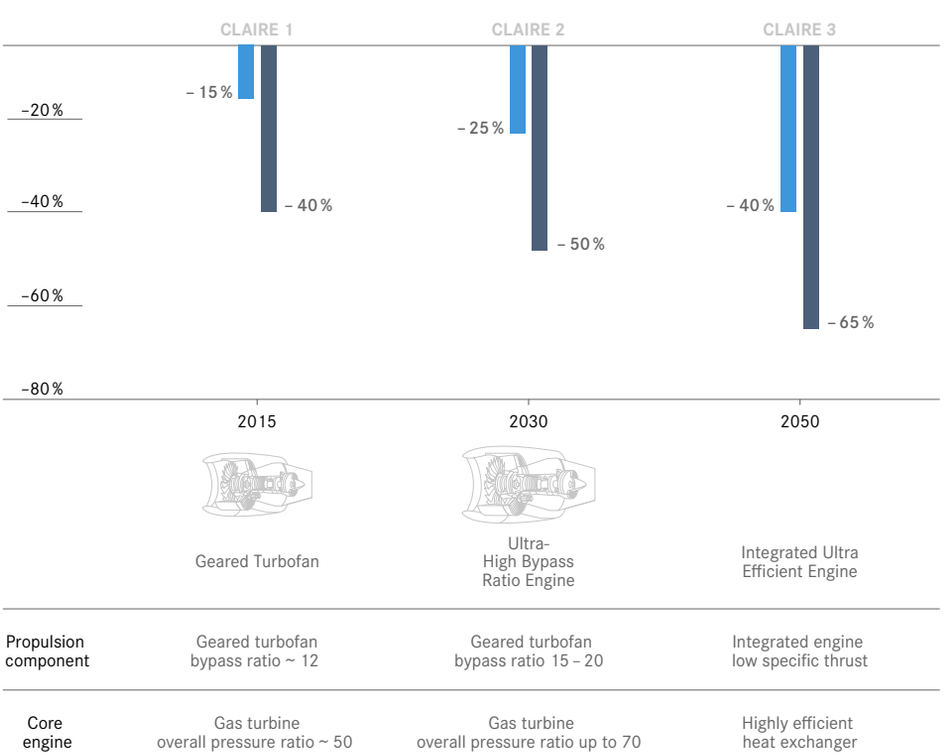
MTU's Claire (Clean Air Engine) technology program covers all the technology that, in the long term, will need to be developed in order to achieve reductions in $CO_2$, $NO_x$ and noise emissions.

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 pressure and temperature ratios. The goal is to cut fuel consumption and carbon dioxide emissions by 25 % each and to halve noise emissions.

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, made possible 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




Fuel consumption/ $CO_2$ emissions

noise emissions

Change compared to an engine from the year 2000

## 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 level. 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 one third of the series-production GTF engines for the A320neo, and is a partner in the MRO network for the GTF.

In the 2016 financial year, the entry into scheduled service was the most important milestone in the GTF engine programs: The first A320neo powered by PW1100G-JM engines was delivered to Lufthansa in January, and in July the Bombardier C Series 100 with PW1500G engines entered scheduled service for Swiss.

Other GTF applications also made significant progress in 2016. For example, the Embraer E-Jet E190-E2 powered by PW1900G engines began its rollout in February and took its inaugural flight in May. Moreover, the American Federal Aviation Administration (FAA) approved the PW1400G-JM for the Russian Irkut MS-21 in May; the rollout took place in June.

More than 8,000 firm orders and options for geared turbofan™

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 2016, 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 | MS-21 |
| PW1500G | 17% | Bombardier | C Series |
| PW1700G | 15% | Embraer | E-Jet E175-E2 |
| PW1900G | 17% | Embraer | E-Jet E190-E2 / E195-E2 |

MTU has secured a significant share in the market for high-thrust engines for long-haul jets: It is involved with GE Aviation's GE9X program for the new Boeing 777X, where it is responsible for the development and manufacture of the extremely demanding turbine center frame. The first module was delivered to GE in January 2016. The test runs for the first prototype engine began in late March. The engine is scheduled for certification in 2018.

**Military engine programs**

Military engine development activities continued to focus on the TP400-D6 for the Airbus A400M military transporter. This three-shaft engine is the most powerful turboprop engine in the Western world. MTU is contributing the entire intermediate-pressure section, comprising compressor, turbine and spool, as well as developing the engine- and propeller-control systems in cooperation with French partner Safran Aircraft Engines. The program has now progressed from the development phase to series production and launch, and delivery of the A400M has begun.

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 and the helicopter has now completed tests with the maximum external load.

At the end of 2015, the German Federal Ministry of Defence (BMVg) issued a military aerospace strategy that forms the basis for the MTU technology roadmap for the updating of existing and development of new systems.

**Component 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. In the year under review, MTU conducted extensive turbine tests at the University of Stuttgart altitude testing facility, and put a new high-pressure compressor through its paces at the company's own compressor testing facility. These tests were used to examine and validate complex aerodynamic improvements. Within the framework of the Clean Sky technology program, the largest aeronautics research program that the EU has ever funded, MTU is responsible for one of five engine demonstrators. In the year under review, a demonstration engine based on the PW1500G turbofan was subjected to extensive tests at the MTU development testing facility. Under real mechanical and thermal conditions, these tests proved the technological maturity of numerous new materials, designs and construction methods, such as new damping systems, brush seals, additively manufactured seal support systems and lightweight ceramic and carbon-fiber reinforced composite materials.

**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 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.

Successes in the field of additive manufacturing

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 savings and better product features. MTU has already achieved initial successes in the field of additive manufacturing.

**Manufacturing and maintenance technologies**

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.

The last few years have seen MTU carve out a leading position in the manufacture of blisk rotors for compressors. Since demand for blisk rotors is set to rise substantially as the geared turbofan™ goes into production, MTU has established a new center of excellence for blisk production in Munich. The center covers an area of 10,000 m² and is one of the biggest and most flexible blisk production facilities ever constructed. In the year under review, MTU installed further high-speed milling machines, raising its capacity to 3,500 blisks per year. One key factor here is the process stability, which is guaranteed, among other things, by using identical milling machines and software, ensuring unvarying temperature in the factory, and by means of a centralized supply of coolant and lubricant. For the blisks made of nickel-base alloys, which are extremely difficult to process, and which are used in the rear stages of high-pressure compressors, MTU has developed a new electrochemical material-removal process in recent years (Precise Electrochemical Machining = PECM), which went into series operation in 2016. By working with an extremely small inter-electrode gap, in the micrometer range, PECM accomplishes much greater reproduction precision, thus enabling extremely complex blade forms to be manufactured.

New assembly line for PW1100G-JM

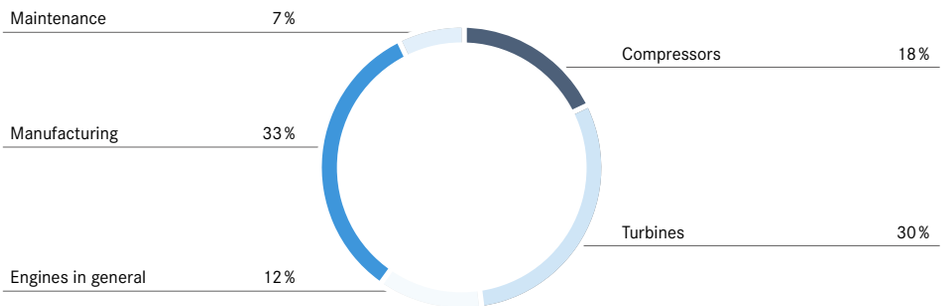
Final assembly of a third of the PW1100G-JM engines is conducted in Munich. A flexible new assembly line has been set up for this purpose. It uses a transport system similar to an assembly line, into which pre-assembled components and modules are fed from the side for final assembly. In September, MTU was one of three production venues worldwide to receive approval from the U.S. Federal Aviation Administration for the final assembly and testing of the PW1100G-JM, and the assembly line was then officially inaugurated in October.

**Protecting technology assets (intellectual capital)**

At December 31, 2016, MTU's portfolio of intellectual property (IP) rights contained 1,068 patent families (representing 3,101 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, and the post was filled at the beginning of the year. 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 | 2016 | 2015 | Change 2016 - 2015 in € million | Change 2016 - 2015 in % |
|---|---|---|---|---|
| Commercial engine business (OEM) | 188.0 | 183.8 | 4.2 | 2.3 |
| Military engine business (OEM) | 15.5 | 20.0 | –4.5 | –22.5 |
| Commercial maintenance business (MRO) | 5.1 | 6.2 | –1.1 | –17.7 |
| **Total research and development expenditure** | **208.6** | **210.0** | **–1.4** | **–0.7** |
| Customer-funded R&D expenditure | –40.6 | –41.3 | 0.7 | 1.7 |
| **Company-funded R&D expenditure** | **168.0** | **168.7** | **–0.7** | **–0.4** |
| Expenditure meeting recognition criteria for intangible assets | | | | |
| Commercial engine business (OEM) | –96.2 | –102.2 | 6.0 | 5.9 |
| Commercial maintenance business (MRO) | –0.7 | | –0.7 | |
| **Research and development costs recognized as expense** | **71.1** | **66.5** | **4.6** | **6.9** |
| Amortization of capitalized development costs | 10.2 | 2.3 | 7.9 | >100 |
| **R&D expenditure impact on adjusted EBIT** | **81.3** | **68.8** | **12.5** | **18.2** |

Research and development expenditure in the reporting period totaled € 208.6 million, down € 1.4 million on the previous year. At 4.4 %, research and development expenditure as a percentage of revenues was slightly lower than the 2015 figure of 4.7 %.

Externally funded development expenditure in the amount of € 40.6 million (2015: € 41.3 million) primarily relates to the military engine business. Due to the fact that the work is conducted under contract to national and international consortia on a customer-specific basis, it is accounted for as construction contracts and disclosed in Note 2 to the consolidated financial statements (Cost of sales).

→ further information on page 164

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).

→ further information on page 164

The capitalized company-funded development costs of € 96.2 million (2015: € 102.2 million) posted in the OEM segment (commercial and military engine business) relate especially to the GTF engines and to the T408, GE9X and PW800 engine programs.

The amortization expense on capitalized development costs recognized under cost of sales relates principally to development costs for the PW1100G-JM and the PW1500G, which were amortized for the first time in 2016 now that deliveries of these engine types have commenced.

# Business environment

## Macroeconomic factors

In 2016, the global economy grew by 2.2% overall compared with 2.6% in 2015. The weak U.S. economy in the first half-year, coupled with the recession in Russia and Brazil, reined in the growth momentum. Following a slowdown lasting several years, growth in the emerging economies stabilized, while in the industrialized countries it remained sluggish.

The U.S. economy grew by 1.6% in 2016 compared with 2.5% in the previous year. Foreign trade bolstered growth; however, investments and private consumption failed to measure up to expectations.

The eurozone once again generated moderate growth, the economy there expanding by 1.7% compared with 2.0% in 2015. This trend was favored by the European Central Bank's expansionary monetary policy, continued low oil prices and the decline of the euro against other currencies.

Economic growth in China exceeded expectations in 2016 and stabilized at 6.7%, with business starting to pick up again in the construction, retail and real estate sectors. A weak yuan led to a rise in global demand and a higher export volume.

The weak economy and oversupply put pressure on oil prices. The EIA averaged the price of a barrel of Brent crude oil at U.S. $ 43 over the year. At the end of September 2016, the 14 OPEC states agreed on market stabilization measures aimed at reducing the oversupply and raising the price level.

## Microeconomic factors in the aviation industry

The aviation industry was influenced by a number of factors in 2016:

Terrorist attacks and political instability dampened growth, which diverged greatly from region to region. Above all on international routes linking Europe and Asia, demand remained sluggish, while the African, U.S. and Eastern European markets recovered.

Global passenger traffic increased by 6.3% in 2016. In Asia, demand rose by 8.9%, in North America by 3.2% and in Europe by 3.8%.

**6.3%** more passengers worldwide

Low fares stimulated demand as falling kerosene prices and competitive pressure led airlines to reduce ticket prices.

Rising passenger numbers prompted airlines to expand their fleets, and the global fleet grew by 5.2% in 2016 (source: Ascend).

According to the International Air Transport Association IATA, airlines posted record profits in 2016.The industry's net income reached U.S. $ 35.6 billion, compared with U.S. $ 35.3 billion in 2015. The background was above all low oil prices, which according to the EIA are likely to remain at less than U.S. $ 60 a barrel through 2020.

Furthermore, airlines deployed more efficient aircraft and reaped the benefits of the restructuring measures successfully undertaken in the previous years.

Airbus and Boeing delivered 1,436 aircraft in 2016, compared with 1,397 in the previous year. At 13,442, the order backlog for aircraft seating 100 or more passengers remained at the same level as at year's-end 2015 (source: Ascend Online).

429 business jets were delivered in the first nine months of 2016, down 7.7% on the same period of 2015, in which 465 aircraft were delivered (source: GAMA). Demand in the emerging economies is currently weak.

## Overall assessment of the business environment

Global economic growth
2.2%

In 2016, the global economy grew by 2.2%.

Growth in the industrialized countries remained weak, while in the emerging economies it stabilized.

The aviation sector grew faster than the global economy. Low oil prices and the increase in passenger traffic had a positive impact on the aviation industry. Global passenger traffic increased by 6.3% in 2016.

The airlines posted record profits in 2016, with Airbus and Boeing again delivering more aircraft than in 2015. The order backlog for aircraft seating 100 or more passengers remained at record levels.

# Financial situation

The following explanatory comments and analyses are based on the audited MTU consolidated financial statements for the financial years ending December 31, 2016 and 2015. The consolidated financial statements are 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 2016. 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 2016).

→ further information on page 149

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, 2016 1 Euro =** | Dec. 31, 2015 1 Euro = | **2016 1 Euro =** | 2015 1 Euro = |
| United States dollar | USD | 1.0541 | 1.0887 | 1.1069 | 1.1095 |
| Canadian dollar | CAD | 1.4188 | 1.5116 | 1.4659 | 1.4186 |
| Chinese yuan renminbi | CNY | 7.3202 | 7.0608 | 7.3522 | 6.9733 |
| Polish zloty | PLN | 4.4103 | 4.2639 | 4.3632 | 4.1841 |

# Operating results

## Group

Order backlog
€ 14.2 billion

**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, 2016, the order backlog (before consolidation) amounted to € 14.2 billion (2015: € 12.5 billion).

Consolidated income statement

| | | | Change 2016 - 2015 | |
|---|---|---|---|---|
| in € million | 2016 | 2015 | in € million | in % |
| **Revenues** | **4,732.7** | **4,435.3** | **297.4** | **6.7** |
| Cost of sales | –4,074.8 | –3,855.0 | –219.8 | –5.7 |
| **Gross profit** | **657.9** | **580.3** | **77.6** | **13.4** |
| Costs by function | –205.1 | –194.7 | –10.4 | –5.3 |
| Depreciation / amortization effects of purchase price allocation / V2500 stake increase | 50.2 | 54.7 | –4.5 | –8.2 |
| **Adjusted earnings before interest and tax (adjusted EBIT)** | **503.0** | **440.3** | **62.7** | **14.2** |
| Depreciation / amortization effects of purchase price allocation / V2500 stake increase | –50.2 | –54.7 | 4.5 | 8.2 |
| **Earnings before interest and tax (EBIT)** | **452.8** | **385.6** | **67.2** | **17.4** |
| Financial result | –37.2 | –64.8 | 27.6 | 42.6 |
| **Earnings before tax** | **415.6** | **320.8** | **94.8** | **29.6** |
| Income taxes | –103.0 | –103.2 | 0.2 | 0.2 |
| **Earnings after tax** | **312.6** | **217.6** | **95.0** | **43.7** |
| Basic earnings per share in € | 6.09 | 4.26 | 1.83 | 43.0 |
| Diluted earnings per share in € | 5.83 | 4.26 | 1.57 | 36.9 |

Group revenues up
6.7 %

**Revenues**

The growth in group revenues in 2016 is mainly due to the evolution of the MRO segment (commercial maintenance business). Revenues in this segment (before consolidation) rose by € 333.8 million from € 1,580.6 million in the previous year to € 1,914.4 million. In the OEM segment (commercial and military engine business), revenues (before consolidation) increased by € 8.1 million from € 2,897.1 million in 2015 to € 2,905.2 million.

**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 a rise in gross profit as well as an improved gross margin, which amounted to 13.9% in 2016 (2015: 13.1%). The main factors responsible for this change in 2016 were the favorable U.S. dollar exchange rate against the euro and the strong growth in the MRO segment.

Gross margin increased to
13.9%

**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 (adjusted EBIT), adjusted EBIT margin, and adjusted earnings before and after tax. 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 adjusted EBIT. 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 earnings after tax. The normalized income tax expense is calculated on the basis of the expected average tax rate for the group (for the financial year 2016: 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 | 2016 Financial year | 2016 Non-recurring items | 2016 Financial year w / o non-recurring items | 2015 Financial year | 2015 Non-recurring items | 2015 Financial year w / o non-recurring items |
|---|---|---|---|---|---|---|
| **Revenues** | **4,732.7** | | **4,732.7** | **4,435.3** | | **4,435.3** |
| Cost of sales | –4,074.8 | 50.2 | –4,024.6 | –3,855.0 | 54.7 | –3,800.3 |
| **Gross profit** | **657.9** | **50.2** | **708.1** | **580.3** | **54.7** | **635.0** |
| Research and development expenses | –71.1 | | –71.1 | –66.5 | | –66.5 |
| Selling expenses | –104.0 | | –104.0 | –94.3 | | –94.3 |
| General administrative expenses | –70.8 | | –70.8 | –65.6 | | –65.6 |
| Other operating income and expenses | 10.1 | | 10.1 | 1.0 | | 1.0 |
| Profit / loss of companies accounted for using the equity method | 28.6 | | 28.6 | 29.1 | | 29.1 |
| Profit / loss of companies accounted for at cost | 2.1 | | 2.1 | 1.6 | | 1.6 |
| **Earnings before interest and tax (EBIT)** | **452.8** | **50.2** | **503.0** | **385.6** | **54.7** | **440.3** |
| Financial result | –37.2 | 9.0 | –28.2 | –64.8 | 50.4 | –14.4 |
| **Earnings before tax** | **415.6** | **59.2** | **474.8** | **320.8** | **105.1** | **425.9** |
| Income taxes | –103.0 | –26.4 | –129.4 | –103.2 | –15.8 | –119.0 |
| **Earnings after tax** | **312.6** | **32.8** | **345.4** | **217.6** | **89.3** | **306.9** |
| **EBIT** | **452.8** | **50.2** | **503.0** | **385.6** | **54.7** | **440.3** |
| Depreciation / amortization of: | | | | | | |
| Intangible assets | | | | | | |
| - Effects of purchase price allocation / V 2500 stake increase | 49.9 | –49.9 | | 54.2 | –54.2 | |
| Property, plant and equipment | | | | | | |
| - Effects of purchase price allocation | 0.3 | –0.3 | | 0.5 | –0.5 | |
| **Adjusted EBIT** | **503.0** | | **503.0** | **440.3** | | **440.3** |

Adjusted EBIT
€ 503.0 million

**Earnings before interest and tax (EBIT)**

In 2016, 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 € 67.2 million (17.4 %) compared with the previous year. The EBIT margin rose by 0.9 percentage points to 9.6 % (2015: 8.7 %). Adjusted earnings before interest and tax (adjusted EBIT) increased by € 62.7 million, which is 14.2 % higher than in 2015. The adjusted EBIT margin was 10.6 % (2015: 9.9 %).

**Financial result**

MTU's financial result improved by € 27.6 million in the financial year 2016 resulting in a net expense of € 37.2 million (2015: € 64.8 million). Within this line item, the net interest expense deteriorated, increasing by € 10.8 million compared with 2015, mainly due to lower capitalized borrowing costs for qualifying assets and to the interest expense on the convertible bond issued in the reporting period. The financial result on other items amounted to a net expense of € 25.3 million in 2016, which is € 38.4 million lower than in the previous financial year, when the net expense amounted to € 63.7 million. The main factor responsible for this change was fair value gains on derivatives amounting to € 7.5 million (2015: fair value losses of € 34.6 million).

**Earnings before tax (EBT)**

The company's good operating performance coupled with the improved financial result had a positive impact on earnings before tax. Overall, EBT rose by € 94.8 million to € 415.6 million (2015: € 320.8 million).

**Income taxes**

Income taxes amounted to € 103.0 million in the financial year 2016 (2015: € 103.2 million). The effective group tax rate, calculated on the basis of earnings before tax, was 24.8% (2015: 32.2%). 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 167

**Earnings after tax (EAT)**

Earnings after tax increased by € 95.0 million (43.7%) to € 312.6 million (2015: € 217.6 million) and adjusted earnings after tax by € 38.5 million (12.5%) to € 345.4 million (2015: € 306.9 million).

**Consolidated statement of comprehensive income**

In the consolidated statement of comprehensive income, earnings after tax amounting to € 312.6 million (2015: € 217.6 million) are reconciled with the total comprehensive income for the period of € 251.2 million (2015: € 177.0 million).

The main income and expense item recognized directly in other comprehensive income in 2016, net of deferred taxes, was the increase of € 54.3 million (2015: € 10.5 million) in actuarial losses on plan assets and pension obligations. The actuarial losses resulted principally from the change in the applied discount rate, which was reduced from 2.05% to 1.35% in the reporting period.

**Earnings per share**

Basic earnings per share amounted to € 6.09 (2015: € 4.26). In view of the recognition on a pro rata basis of the maximum number of exercisable share conversion options in respect of the convertible bond issued in the reporting year, diluted earnings per share amounted to € 5.83 (2015: € 4.26).

Earnings per share
€ 6.09

**Net profit available for distribution and dividend**

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. On condition that the Annual General Meeting approves the dividend of € 1.90 per share proposed by the Executive Board and Supervisory Board, the total amount distributed will be € 97.6 million for the 51,356,103 shares entitled to receive a dividend.

→ further information on page 219

## OEM segment

OEM order backlog
€ 7.2 billion

**Order backlog**

The order backlog for the OEM segment (commercial and military engine business) is reported on the basis of list prices. Given that orders for spare parts for commercial engines are generally completed within a short time of their receipt, the order backlog does not contain a substantial volume of such orders. The order backlog in the OEM segment stood at € 7,246.0 million as of December 31, 2016, compared with € 6,830.6 million at the end of 2015.

Order backlog for commercial and military engine business (OEM)

| | | | Change 2016 - 2015 | |
|---|---|---|---|---|
| in million | Dec. 31, 2016 | Dec. 31, 2015 | in million | in % |
| Commercial engines in U.S. $ | 7,113.6 | 6,888.5 | 225.1 | 3.3 |
| Commercial engines in € | 6,748.5 | 6,327.3 | 421.2 | 6.7 |
| Military engines in € | 497.5 | 503.3 | –5.8 | –1.2 |
| **Total order backlog in €** | **7,246.0** | **6,830.6** | **415.4** | **6.1** |

**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. $ 7,113.6 million as of December 31, 2016, and was thus U.S. $ 225.1 million (3.3%) higher than the 2015 figure of U.S. $ 6,888.5 million.

The order backlog translated into euros at the 2016 year-end closing rate increased by € 421.2 million (6.7%) to € 6,748.5 million (2015: € 6,327.3 million).

**Military engine business**

In the case of military programs, the customer typically places an order for a fixed number of engines at the time the production agreement is concluded. 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 deliveries.

The volume of orders for military engines, which are contracted in euros, totaled € 497.5 million at the end of 2016. This was € 5.8 million (1.2%) below the previous year's amount of € 503.3 million.

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

**Revenues**

The company generated revenues of € 2,905.2 million in the OEM segment, which is a slight increase over the 2015 figure of € 2,897.1 million.

Revenues in the commercial engine business decreased by € 12.8 million (0.5%) to € 2,401.2 million. Even after adjustments to account for the effect of the U.S. dollar exchange rate, these revenues decreased slightly. The engines that generated the largest shares of these revenues were the V2500 for the A320 family, the GP7000 for the Airbus A380 and the GEnx for Boeing's 787 Dreamliner and 747-8.

Revenues in the military engine business were higher than in 2015, increasing by € 20.9 million (4.3%) from € 483.1 million to € 504.0 million. The main source of these revenues was the EJ200 engine for the Eurofighter.

Revenues and adjusted EBIT (OEM)

| | | | Change 2016 - 2015 | |
|---|---|---|---|---|
| in € million | 2016 | 2015 | in € million | in % |
| **Revenues** | **2,905.2** | **2,897.1** | **8.1** | **0.3** |
| Cost of sales | –2,482.6 | –2,518.2 | 35.6 | 1.4 |
| **Gross profit** | **422.6** | **378.9** | **43.7** | **11.5** |
| Gross margin in % | 14.5 | 13.1 | | |
| **Adjusted EBIT** | **321.5** | **285.0** | **36.5** | **12.8** |
| Adjusted EBIT margin in % | 11.1 | 9.8 | | |

**Adjusted EBIT**

Adjusted earnings before interest and tax (adjusted EBIT) in the OEM segment increased by € 36.5 million to € 321.5 million (2015: € 285.0 million). The adjusted EBIT margin increased accordingly from 9.8% to 11.1%. Operating profit benefited in particular from the favorable U.S. dollar-euro exchange rate as well as from an increase in revenues from spare parts sales relating to the V2500 program.

**Capital expenditure**

Capital expenditure on intangible assets amounted to € 114.3 million (2015: € 160.9 million) and mainly concerned capitalized development costs for the GTF engines and for the T408, GE9X and PW800 programs. Capital expenditure on property, plant and equipment amounted to € 112.1 million (2015: € 102.9 million) and related in particular to technical equipment, plant and machinery and operational and office equipment required in respect of the ramp-up to series production of the geared turbofan™ programs.

**Employees**

The average number of employees in the OEM segment increased only slightly by 26 to 5,363 (2015: 5,337).

## MRO segment

**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.

MRO order backlog increased by
€ 1.3 billion

Order backlog for commercial maintenance business (MRO)

| | | | Change 2016 - 2015 | |
|---|---|---|---|---|
| in million | Dec. 31, 2016 | Dec. 31, 2015 | in million | in % |
| Order backlog in U.S. $ | 7,300.9 | 6,165.4 | 1,135.5 | 18.4 |
| **Order backlog in €** | **6,926.2** | **5,663.1** | **1,263.1** | **22.3** |

The majority of contracts in the MRO segment are priced in U.S. dollars. The order backlog for the commercial maintenance business in 2016 amounted to U.S. $ 7,300.9 million, which is U.S. $ 1,135.5 million or 18.4% higher than the 2015 figure of U.S. $ 6,165.4 million.

Translated into euros at the 2016 year-end closing rate, the order backlog increased significantly by € 1,263.1 million (22.3%) to € 6,926.2 million (2015: € 5,663.1 million). In the year under review, orders were boosted by several MRO marketing campaigns for engines such as the CF34, CFM56 and V2500 and for industrial gas turbines.

In arithmetical terms, the order backlog represents a production workload of approximately 3.5 years.

MRO revenues increased by
21.1%

**Revenues**

MTU's revenues in the commercial maintenance business (before consolidation) increased by € 333.8 million (21.1%) to € 1,914.4 million (2015: € 1,580.6 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.

Revenues and adjusted EBIT (MRO)

| | | | Change 2016 - 2015 | |
|---|---|---|---|---|
| in € million | 2016 | 2015 | in € million | in % |
| **Revenues** | **1,914.4** | **1,580.6** | **333.8** | **21.1** |
| Cost of sales | –1,679.6 | –1,379.5 | –300.1 | –21.8 |
| **Gross profit** | **234.8** | **201.1** | **33.7** | **16.8** |
| Gross margin in % | 12.3 | 12.7 | | |
| **Adjusted EBIT** | **181.5** | **155.2** | **26.3** | **16.9** |
| Adjusted EBIT margin in % | 9.5 | 9.8 | | |

**Adjusted EBIT**

In 2016, adjusted EBIT for the MRO segment grew by € 26.3 million (16.9%) to € 181.5 million. The main contributing factors were the strong capacity utilization of MTU's MRO facilities and the favorable U.S. dollar-euro exchange rate. The adjusted EBIT margin decreased to 9.5% (2015: 9.8%), as a result of the product mix.

**Capital expenditure**

Capital expenditure on intangible assets and property, plant and equipment increased by € 2.5 million to € 48.4 million (2015: € 45.9 million). This increase was due to new and replacement purchases of technical equipment, plant and machinery and of operational and office equipment.

**Employees**

Despite increasing revenues, the average number of employees in the MRO segment fell slightly by 22 to 2,989 (2015: 3, 011). This decrease is explained by the relatively high proportion of value added contributed by materials rather than labor.

# Financial situation

## Principles and objectives of financial management

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.

Longer-term liquidity forecasts are based on the group's operational 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.

→ further information on page 183

## 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.

Financing sources

| Financing instruments | Maturity date | Currency | Interest rate |
|---|---|---|---|
| Registered bond | June 12, 2028 | Euro | Fixed |
| Corporate bond | June 21, 2017 | Euro | Fixed |
| Convertible bond | May 17, 2023 | Euro | Fixed |
| Note purchase agreement | March 27, 2021 | Euro | 6-month Euribor + margin |
| Pension obligations | continuous | Euro | Yield as for premium fixed-income industrial bonds |
| Revolving credit facility | October 28, 2021 | Euro | Euribor rate + margin |
| Money market facility | money at call | Euro | Fixed |
| Operating lease agreements | 1 - 5 years | Euro / U.S. dollar | 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 to a minor extent, 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, 2016 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 192 and page 129

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.

→ further information on page 113 and page 208

The eurozone sovereign debt crisis had no significant impact on the group's overall financial situation. MTU does not hold any financial instruments as defined in IAS 39 or IFRS 7 that are affected by the current sovereign debt crisis.

As in previous years, MTU did not engage in any transactions in 2016 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

Stable 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, 2016 was € 10.8 million (1.2%) higher than at the same date one year earlier.

Net financial debt

| in € million | Dec. 31, 2016 | Dec. 31, 2015 | Change 2016 - 2015 in € million | Change 2016 - 2015 in % |
|---|---|---|---|---|
| Bonds and notes | 353.6 | 353.2 | 0.4 | 0.1 |
| Convertible bond | 474.6 | | 474.6 | |
| Financial liabilities to banks | 30.1 | 149.2 | –119.1 | –79.8 |
| thereof: Note purchase agreement | 30.1 | 30.1 | | |
| thereof: Revolving credit facility | | 99.1 | –99.1 | –100.0 |
| thereof: Other liabilities to banks | | 20.0 | –20.0 | –100.0 |
| Finance lease liabilities | 11.6 | 12.9 | –1.3 | –10.1 |
| Financial liabilities arising from program participations | 492.0 | 531.4 | –39.4 | –7.4 |
| thereof: Financial liabilities arising from IAE-V2500 stake increase | 400.3 | 419.6 | –19.3 | –4.6 |
| **Gross financial debt** | **1,361.9** | **1,046.7** | **315.2** | **30.1** |
| less: | | | | |
| Cash and cash equivalents | 322.4 | 53.1 | 269.3 | >100 |
| Loans to third parties | 98.6 | 60.7 | 37.9 | 62.4 |
| Loan to related companies | 23.9 | 13.8 | 10.1 | 73.2 |
| Securities | 25.0 | 37.9 | –12.9 | –34.0 |
| **Financial assets** | **469.9** | **165.5** | **304.4** | **>100** |
| **Net financial debt** | **892.0** | **881.2** | **10.8** | **1.2** |

**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 earns 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 is 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.

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 securitie instruments 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 one of its security instruments 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 any of its security instruments, and no investment-grade rating is issued for the security in question within the change-of-control period.

€ 500 million
bond issue

**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 an 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

At December 31, 2015, the company had access to a revolving credit facility of € 400.0 million with five banks, which previously ran until October 30, 2020. This line of credit was increased by € 200.0 to € 600.0 in 2016 and now runs until October 28, 2021. A total of € 13.8 million had been drawn down under this facility at December 31, 2016, in the form of guarantees in favor of third parties (2015: draw-downs totaling € 113.7 million, of which € 14.6 million in the form of guarantees). The remaining available amount of € 586.2 million (2015: € 286.3 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).

→ further information on page 148 and page 174

**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.

**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 LM6000-PF+, 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 2016 - 2015 | |
|---|---|---|---|---|
| in € million | 2016 | 2015 | in € million | in % |
| OEM | 114.3 | 160.9 | –46.6 | –29.0 |
| MRO | 1.1 | 18.9 | –17.8 | –94.2 |
| **Intangible assets** | **115.4** | **179.8** | **–64.4** | **–35.8** |
| OEM | 112.1 | 102.9 | 9.2 | 8.9 |
| MRO | 47.3 | 27.0 | 20.3 | 75.2 |
| **Property, plant and equipment** | **159.4** | **129.9** | **29.5** | **22.7** |
| OEM | 77.2 | 30.5 | 46.7 | >100 |
| MRO | 27.6 | 31.5 | –3.9 | –12.4 |
| **Financial assets** [1] | **104.8** | **62.0** | **42.8** | **69.0** |
| **Total capital expenditure** | **379.6** | **371.7** | **7.9** | **2.1** |

[1] Financial assets accounted for using the equity method or at cost.

**Capital expenditure on intangible assets**

Capital expenditure on intangible assets mainly relates to development costs incurred in the OEM segment (commercial and military engine business), totaling € 98.1 million (2015: € 108.7 million), notably in connection with the company's partnership with P&W on the GTF engine family, with P&WC on the PW800, and with GE on the T408 and GE9X programs. Moreover, in 2016, the carrying amount of the program assets resulting from the IAE-V2500 stake increase was increased by € 5.6 million (2015: reduction of € 4.7 million) due to the amortization of the conditional purchase price component. Detailed information on capital expenditure on intangible assets is provided in Note 14 to the consolidated financial statements (Intangible assets).

→ further information on page 174

**Capital expenditure on property, plant and equipment**

Additions to land, leasehold rights and buildings, including buildings on non-owned land, amounted to € 3.7 million in the 2016 financial year (2015: € 2.6 million) and relate mainly to the expansion of warehouse facilities at the MTU Aero Engines AG location in Munich to support the ramp-up of the geared turbofan programs. Capital expenditure on technical equipment, plant and machinery totaling € 20.3 million (2015: € 18.0 million) relates mainly to the purchase of plant and machinery for the production of engine modules for the GTF family. The capital expenditure on equipment, operational, and office equipment totaling € 84.3 million (2015: € 60.8 million) mainly comprises the acquisition or construction costs of production resources and tools for programs in the ramp-up phase, certification and leasing engines, and data processing systems. Advance payments and construction in progress increased to € 51.1 million in the 2016 financial year (2015: € 48.5 million), and relate mainly to the expansion of production capacity at the MTU locations in Munich and Hannover. Further information on capital expenditure on property, plant and equipment is provided in Note 15 to the consolidated financial statements (Property, plant and equipment).

→ further information on page 174

## Liquidity analysis

Free cash flow
**€ 82.0 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 activities, corresponding adjustments are applied. The free cash flow of € 82.0 million (2015: € 72.0 million) therefore excludes the following components of cash flow from investing activities: expenditure on stakes in engine programs amounting to € 5.8 million (2015: 47.1 million), payments related to interest-bearing loans in connection with aircraft and engine financing agreements amounting to € 44.9 million (2015: € 25.0 million), investments and disinvestments of financial assets held for the purpose of liquidity management amounting to a negative adjustment of € 12.7 million (2015: € 28.5 million). In the financial year 2016, the acquisition costs of shares in engine programs related to the GE9X and GE LM6000-PF+ programs.

Consolidated cash flow statement (abridged)

| | | | Change 2016 - 2015 | |
|---|---|---|---|---|
| in € million | 2016 | 2015 | in € million | in % |
| Cash flow from operating activities | 358.0 | 296.2 | 61.8 | 20.9 |
| Cash flow from investing activities | –314.0 | –267.8 | –46.2 | –17.3 |
| + Non-recurring cash outflows | 38.0 | 43.6 | –5.6 | –12.8 |
| **Free cash flow** | **82.0** | **72.0** | **10.0** | **13.9** |
| - Non-recurring cash outflows | –38.0 | –43.6 | 5.6 | 12.8 |
| Cash flow from financing activities | 223.3 | –42.7 | 266.0 | >100 |
| Translation differences | 2.0 | 2.8 | –0.8 | –28.6 |
| **Change in cash and cash equivalents** | **269.3** | **–11.5** | **280.8** | **>100** |
| Cash and cash equivalents at beginning of financial year | 53.1 | 64.6 | | |
| Cash and cash equivalents at end of financial year | 322.4 | 53.1 | | |

**Cash flow from operating activities**

The cash inflow from operating activities in 2016 amounted to € 358.0 million, which was € 61.8 million (20.9 %) higher than the 2015 figure of € 296.2 million. The main contributing factors to this positive result in 2016 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 2016 amounted to € 314.0 million (2015: € 267.8 million). Capital expenditure on intangible assets accounted for € 108.1 million (2015: € 142.8 million) of this amount, and mainly comprised development costs for the PW1000G family, PW800, T408 and GE9X programs. Capital expenditure on property, plant and equipment, excluding the proceeds from disposals, amounted to € 154.7 million, compared with € 125.4 million in 2015. 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 interest-bearing loans in connection with aircraft financing agreements.

**Cash flow from financing activities**

In the financial year 2016, MTU had a net cash inflow from financing activities of € 223.3 million (2015: a net cash outflow of € 42.7 million). This cash flow reversal results from a changed balance in which, on the input side, the issue of the new convertible bond (including transaction fees) generated income of € 495.3 million, while on the output side an amount of € 86.9 million was paid out as dividend for the financial year 2015 (€ 74.0 million for the financial year 2014), an amount of € 72.9 million (2015: € 86.1 million) was recognized in respect of the settlement of purchase price obligations in connection with the purchase of stakes in the PW1000G and PW800 programs and the increased stake in the IAE-V2500 program. Other debit items were the repayment of loans under the revolving credit facility, amounting to € 99.1 million, and other liabilities to banks totaling € 20.0 million.

**Change in cash and cash equivalents**

Cash and cash equivalents increased by € 269.3 million (2015: decrease of € 11.5 million), mainly as a result of changes in the cash flow from financing activities.

## Net assets

Total assets grew by € 656.3 million (12.6 %) year on year to € 5,844.6 million (2015: € 5,188.3 million).

**Changes in balance sheet items**

MTU consolidated balance sheet

| in € million | Dec. 31, 2016 in € million | Dec. 31, 2016 in % | Dec. 31, 2015 in € million | Dec. 31, 2015 in % | Change 2016 - 2015 in € million | Change 2016 - 2015 in % |
|---|---|---|---|---|---|---|
| **Assets** | | | | | | |
| **Non-current assets** | | | | | | |
| Intangible assets and property, plant and equipment | 2,915.7 | 49.9 | 2,846.0 | 54.9 | 69.7 | 2.4 |
| Other assets | 390.7 | 6.7 | 298.4 | 5.7 | 92.3 | 30.9 |
| **Total non-current assets** | **3,306.4** | **56.6** | **3,144.4** | **60.6** | **162.0** | **5.2** |
| **Current assets** | | | | | | |
| Inventories | 1,022.7 | 17.5 | 894.0 | 17.2 | 128.7 | 14.4 |
| Receivables, other assets and advance payments | 1,193.1 | 20.4 | 1,096.8 | 21.1 | 96.3 | 8.8 |
| Cash and cash equivalents | 322.4 | 5.5 | 53.1 | 1.1 | 269.3 | >100 |
| **Total current assets** | **2,538.2** | **43.4** | **2,043.9** | **39.4** | **494.3** | **24.2** |
| **Total assets** | **5,844.6** | **100.0** | **5,188.3** | **100.0** | **656.3** | **12.6** |
| **Equity and liabilities** | | | | | | |
| **Equity** | **1,500.5** | **25.7** | **1,300.6** | **25.1** | **199.9** | **15.4** |
| **Non-current debt** | | | | | | |
| Provisions | 884.0 | 15.1 | 802.3 | 15.4 | 81.7 | 10.2 |
| Liabilities | 1,079.9 | 18.5 | 932.9 | 18.0 | 147.0 | 15.8 |
| **Total non-current debt** | **1,963.9** | **33.6** | **1,735.2** | **33.4** | **228.7** | **13.2** |
| **Current debt** | | | | | | |
| Provisions / Income tax liabilities | 713.8 | 12.2 | 550.5 | 10.6 | 163.3 | 29.7 |
| Liabilities | 1,666.4 | 28.5 | 1,602.0 | 30.9 | 64.4 | 4.0 |
| **Total current debt** | **2,380.2** | **40.7** | **2,152.5** | **41.5** | **227.7** | **10.6** |
| **Total equity and liabilities** | **5,844.6** | **100.0** | **5,188.3** | **100.0** | **656.3** | **12.6** |

## Assets

Intangible assets and property, plant and equipment increased by a total of € 69.7 million to € 2,915.7 million (2015: € 2,846.0 million).

In the financial year 2016, additions to intangible assets amounted to € 20.2 million (2015: € 113.2 million). This increase was mainly due to higher development costs in connection with the new PW1000G, PW800, T408 and GE9X engine programs.

The increase in property, plant and equipment of € 49.5 million (2015: € 21.9 million) relates principally to the purchase of technical equipment, plant and machinery and additions to operational and office equipment, including special tools and equipment, fixtures and other tools for MTU's locations in Germany and Poland. With a view to expanding its portfolio of MRO services, MTU also purchased engines for leasing purposes on behalf of MTU Maintenance Lease Services B.V., Amsterdam.

The increase in other non-current assets is primarily attributable to the positive development of business by joint ventures and associated companies, which are accounted for using the equity method in the group's consolidated financial statements.

Within the carrying amount of inventories, inventories of raw materials and supplies rose by € 86.1 million to € 407.3 million (2015: € 321.2 million), while finished products and work in progress increased by € 36.1 million to € 594.1 million (2015: € 558.0 million) and advance payments increased by € 6.5 million to € 21.3 million (2015: € 14.8 million). Altogether, inventories accounted for 17.5% (2015: 17.2%) of net assets, a similar proportion to that in 2015. The sales to inventory ratio was 4.9 (2015: 5.4).

The carrying amount of trade receivables decreased slightly to € 692.1 million (2015: € 708.5 million). Compared with the level at December 31, 2015, construction contract and service business receivables (based on percentage of completion), net of the corresponding advance payments received, increased by € 91.9 million to € 393.2 million. Other current assets include an amount of € 54.0 million (2015: € 21.6 million) consisting of payments recoverable from the tax authorities in respect of taxes.

Mainly as a result of financing activities, cash and cash equivalents increased at an exceptionally high rate, and accounted for 5.5% (2015: 1.1%) of total assets at the reporting date.

In terms of the structure of assets, the proportion of non-current assets decreased by 4.0 percentage points to 56.6% (2015: 60.6%) due to the significant increase in cash and cash equivalents.

## Equity

Changes in equity

| in € million | 2016 | 2015 |
|---|---|---|
| **Group equity at January 1** | **1,300.6** | **1,188.3** |
| Other comprehensive income | | |
| Financial instruments designated as cash flow hedges | –1.6 | –42.8 |
| Actuarial gains and losses on plan assets and pension obligations | –54.3 | –10.5 |
| Translation differences arising from the financial statements of international entities | –5.5 | 12.7 |
| Earnings after tax | 312.6 | 217.6 |
| Dividend payment to shareholders of MTU Aero Engines AG | –86.9 | –74.0 |
| Equity portion of convertible bond[1)] | 16.0 | |
| Issue of treasury shares under the Restricted Stock Plan | 5.1 | |
| Fair-value measurement and issue of treasury shares under the Share Matching Plan | | 0.4 |
| Sale of treasury shares under the MAP employee stock option program | 14.5 | 8.9 |
| **Total change in group equity** | **199.9** | **112.3** |
| **Group equity at December 31** | **1,500.5** | **1,300.6** |

1) after transaction costs and taxes

**Positive changes in equity**

Positive changes in equity in 2016 included an amount of € 312.6 million attributable to earnings after tax (EAT) (2015: € 217.6 million) and an amount of € 16.0 million which represents the equity component of the convertible bond, after deduction of transaction costs and taxes. A further € 19.6 million increase in equity (2015: € 9.3 million) was due to the sale and/or issue of treasury shares to group employees under the MAP employee stock option program, the Restricted Stock Plan and, in 2015, the Share Matching Plan.

**Negative changes in equity**

Negative changes in equity in 2016 include an amount of € 86.9 million for the dividend payment to shareholders of MTU Aero Engines AG for the financial year 2015 (2015: dividend payment of € 74.0 million for the financial year 2014) and an amount of € 5.5 million attributable to translation losses arising from the financial statements of international entities (2015: translation gains of € 12.7 million). Taking deferred tax assets and/or liabilities into account, the subsequent measurement of plan assets and pension obligations resulted in an additional negative change of € 54.3 million (2015: € 10.5 million), owing to actuarial losses. A further change arose from changes in the fair value of financial instruments designated as cash flow hedges. In light of exposure to currency risk, MTU held a portfolio of U.S. dollar forward foreign exchange contracts at December 31, 2016, covering the period up to April 2019 to sell a nominal volume of U.S. $1,680.0 million. In addition, the company held further financial instruments designated as cash flow hedges under contracts extending to mid-2027 to sell a nominal volume of U.S. $489.2 million (2015: U.S. $539.7 million), for which hedging relationships have been established. Measurement of the fair value of the MTU cash flow hedge portfolio at the reporting date, based on a euro-U.S. dollar exchange rate of 1.05 and taking deferred tax assets and/or liabilities into account, resulted in a negative change of € 1.6 million in the fair value recognized under other comprehensive income (OCI) in 2016 (2015: € 42.8 million).

## Liabilities

Among the items of non-current debt, non-current pension provisions increased by € 83.1 million from € 777.5 million in 2015 to € 860.6 million in 2016. The main reason for this increase is the reduction of the discount rate from 2.05% to 1.35% in 2016.

Non-current liabilities comprised non-current gross financial debt amounting to € 982.1 million (2015: € 811.9 million), other financial liabilities of € 74.3 million (2015: € 98.3 million), and deferred tax liabilities amounting to € 23.5 million at December 31, 2016 (2015: € 22.7 million). Long-term liabilities represented 33.6% of total liabilities at December 31, 2016, which is a similar proportion to that in 2015.

The combined total of equity and non-current debt increased in the financial year 2016 by € 428.6 million to € 3,464.4 million (2015: € 3,035.8 million). This means that 104.8% (2015: 96.5%) 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 € 22.7 million (2015: € 24.2 million), which is close to the previous year's level, income tax liabilities, which decreased from € 31.1 million to € 6.8 million, and other provisions of € 684.3 million, which were € 189.1 million higher than in 2015. The increase in other provisions corresponds mainly to sales-related obligations in respect of losses arising from the settlement of accounts, contract penalties, warranty obligations or pending losses on onerous accounts. Current liabilities, which also form part of current debt, include trade payables amounting to € 634.9 million (2015: € 673.4 million), the balance of construction contract and service business payables after deduction of the corresponding receivables, amounting to € 344.2 million (2015: € 373.8 million), gross financial debt of € 379.8 million (2015: € 234.8 million), negative fair values of derivatives amounting to € 91.1 million (2015: € 91.5 million), and sundry other identifiable obligations.

The debt to equity ratio increased year on year by 0.6 percentage points to 25.7% (2015: 25.1%), while current debt decreased by 0.8 percentage points.

# Financial and non-financial performance indicators

## Financial performance indicators

The original forecasts for adjusted EBIT and adjusted earnings after tax were updated in the half-year report and specified as being around € 480 million and € 330 million respectively. The revenue forecast was increased to approximately € 4,700 million, particularly in view of the favorable development of the U.S. dollar exchange rate.

At the time of the third-quarter report, there were indications that earnings would improve. As a consequence, while the revenue forecast was not modified, the adjusted EBIT forecast was raised by € 20 million to € 500 million and that for earnings after tax by € 10 million to € 340 million.

Forecast and actual results

| in € million | Actual 2016 | Forecast 2016 dated October 25, 2016 | Forecast 2016 dated July 26, 2016 | Forecast 2016 dated February 16, 2016 | Actual 2015 | Change 2015 - 2016 in % |
|---|---|---|---|---|---|---|
| Revenues | 4,732.7 | approx. 4,700 | approx. 4,700 | approx. 4,600 - 4,700 | 4,435.3 | 6.7 |
| Adjusted earnings before interest and tax (adjusted EBIT) | 503.0 | approx. 500 | approx. 480 | adjusted EBIT margin of approx. 10% | 440.3 | 14.2 |
| Adjusted earnings after tax | 345.4 | approx. 340 | approx. 330 | Increase in line with adjusted EBIT | 306.9 | 12.5 |

## Revenue forecast

On February 16, 2016, the Executive Board forecast that revenues in 2016 would increase to between € 4,600 million and € 4,700 million (actual 2015: € 4,435.3 million). In the half-year report published on July 26, 2016, this forecast was specified at € 4,700 million. At year end, revenues amounted to € 4,732.7 million, which is in line with the forecast figure. Contrary to expectations, revenues in the OEM segment did not increase in U.S. dollar terms. The main reason for this was the postponement of deliveries in the commercial engine business in connection with the PW1100G-JM program. The military engine business, by contrast, developed somewhat better than predicted, with revenues 4% above those of the previous year. Revenues in the MRO segment grew by 21% in U.S. dollar terms, which is a far better year-on-year improvement than expected.

## Earnings forecast (adjusted EBIT)

MTU's initial forecast for adjusted EBIT was that it should correspond to an adjusted EBIT margin of approximately 10%. On July 26, 2016, the group issued a more concrete forecast of approximately € 480 million. This forecast was revised upward on October 25, 2016, to € 500 million, in light of the third-quarter results showing a further improvement in the company's business prospects. Year-end adjusted EBIT amounted to € 503.0 million, thus confirming the revised forecast.

## Earnings forecast (adjusted earnings after tax)

Earnings after tax exceeded forecast

The Executive Board's initial forecast for adjusted earnings after tax in 2016 was that it would grow in line with adjusted EBIT. A more concrete forecast was issued on July 26, 2016, predicting a year-end result of approximately € 330 million. This forecast was revised upward to € 340 million on October 25, 2016, in line with the corresponding increase in the forecast for operating profit (adjusted EBIT). At December 31, 2016, adjusted earnings after tax amounted to € 345.4 million, which is slightly higher than the predicted result.

## Free cash flow

As in 2015, MTU's expectations were that 2016 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 16, 2016, was that the ratio between

free cash flow and adjusted earnings after tax would lie in the low double digit percentage range. A revised, more concrete forecast of € 70.0 million was issued on July 26, 2016, when the half-year interim report was published. This target was exceeded at December 31, 2016, with a free cash flow of € 82.0 million.

## Overall assessment of business performance in 2016

MTU renews record performance

2016 was yet another record-breaking year for MTU. Revenues increased to € 4,732.7 million, which is 6.7% higher than in the previous year (2015: € 4,435.3 million).

The main revenue driver in 2016 was the MRO segment (commercial maintenance business), which posted an increase in revenues of 21.1%, whereas revenues in the OEM segment (commercial and military engine business) remained stable.

2016 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. One of the key milestones in this process was the entry into commercial service of the PW1100G-JM and PW1500G programs.

MTU's operating profit reached a new record high in 2016, boosted in particular by positive currency translation effects and the strong growth in the MRO segment. Adjusted EBIT amounted to € 503.0 million (2015: € 440.3 million), while the EBIT margin rose to 10.6% (2015: 9.9%).

The free cash flow results were equally gratifying, rising to € 82.0 million (2015: € 72.0 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 military business and commercial maintenance business were higher than expected, thus exceeding the forecasts made at the beginning of the year. These results compensated for the effect of delays in the commercial engine business, enabling the group to surpass its original earnings forecasts substantially.

# Non-financial performance indicators

## Sustainability

MTU assumes responsibility for the environment and society in the same measure as it does for its products, processes, employees, customers, and partners. This understanding of sustainability is anchored in the MTU Principles under the heading "Environment and Society." The principles of this economic, ecological and social responsibility are formulated in a code of conduct that is binding throughout the enterprise. In order to make corporate responsibility (CR) an integral part of everything the company does, MTU has put in place a CR management system, which steers and coordinates CR strategy, activities and targets. The CR steering committee, the highest body within this system, regularly reports to the Executive Board, which bears ultimate responsibility for MTU's sustainability strategy.

With the aid of a materiality analysis, the CR management team identifies key sustainability issues falling within its scope of action. As part of this analysis, the team determines the relevance of economic, ecological and social challenges for MTU and its stakeholders. In 2016, the CR strategy and the areas in which it can be applied were reviewed and adapted. The sustainability management system has been extended to encompass all fully-consolidated entities of the MTU group.

Chief goal: safe, sustainable products

When it comes to corporate responsibility, one of MTU's main points of focus is product development. The company can make its most significant contribution to society by developing outstanding innovations to make aircraft engines more eco-efficient and to conserve the resources required for aviation. That is why safe, sustainable products are the central goal of MTU's sustainability strategy (see also the chapter "Environment").

When putting CR into practice, MTU applies internationally recognized principles. In 2011, for instance, the company joined the UN Global Compact (UNGC). As a Global Compact member, MTU acknowledges its responsibility for protecting the environment, promoting human rights, upholding labor standards and combating corruption. This pact between international corporations and the United Nations was drawn up with the goal of making globalization more socially and ecologically compatible.

MTU is also a signatory to the Standards of the Aerospace and Defence Industries Association of Europe (ASD), which are designed to combat corruption and bribery, and to promote fair competition among equal parties. At a national level, this initiative is supported by the German Aerospace Industries Association (BDLI).

MTU's Sustainability Report is compiled in accordance with the internationally recognized standards of the Global Reporting Initiative (GRI) and the principles of the UNGC. The Sustainability Report 2015 accords with the new GRI G4 standard and encompasses the production locations in Germany and Poland. In fall 2015, MTU integrated all fully consolidated subsidiaries of the MTU group in its sustainability management process, and began preparations for implementing the European CSR directive. In 2016, MTU also reworked its internet stakeholder questionnaire on sustainability strategy, in order to learn more about its stakeholders' expectations in this field.

MTU also expects its suppliers to act responsibly. Suppliers must comply with a contractually agreed code of conduct, which is largely aligned with the ten principles of the UN Global Compact. Any evidence of corruption, extortion, child labor or fraudulent activities leads to immediate termination of the co-operation with the supplier in question.

The company's commitment to society focuses on the areas of education, science, and research, which is why it collaborates with numerous research institutions, to arouse the interest of young people and talented researchers to work on developing eco-efficient engines. In Germany, for instance, MTU throws opens its factory buildings once a year to interested female students as part of the nationwide Girls' Day, while several of the company's sites also take part in the Training Night, an information event for potential trainees. It offers internships and scholarships that are specially tailored to female school and university students.

MTU assists schools in the neighborhood of its sites throughout Germany in presenting technical subjects to school students. It is also partner for events organized by schools, such as nature and technology days. The company museum in Munich opens its doors to the public both during the annual Lange Nacht der Münchner Museen (Long Night of the Munich Museums) and once a quarter.

The company is a major employer at each of its locations, and supports social and charitable institutions. Numerous employees do volunteer work in their private time, and MTU expressly approves their personal initiative and the role model function they embody. The company supports local and supra-regional associations, organizations, and institutions as a promoter, sponsor, and network participant.

Awards for sustainability

MTU is listed in sustainability indices and has already received various awards for its commitment in this area. oekom research AG, one of the world's leading rating agencies in the sustainable investment segment, currently gives MTU a C+ in its Prime Status class. Beyond that, MTU has figured in the STOXX ESG Leader Indices since 2014 due to its above-average ratings in environmental, social and governance aspects. CDP, an organization that collects emissions data from companies worldwide, named MTU "Best Improver Germany" in November 2015 after the company improved its rankings.

Further information on how the company views its social responsibility and the key areas on which its CR activities are focused can be found on the MTU website. MTU's Sustainability Report can be downloaded from http://www.mtu.de/company/corporate-responsibility/reports/. The next report is due to appear in summer 2017. Any questions concerning corporate responsibility can be addressed by e-mail to the CR team: corporateresponsibility@mtu.de.

# Employees

Global MTU workforce

| Number of employees | Dec. 31, 2016 | Dec. 31, 2015 | Change 2016 - 2015 Employees | in % |
|---|---|---|---|---|
| Locations in Germany | 7,182 | 7,172 | 10 | 0.1 |
| International locations | 1,186 | 1,162 | 24 | 2.1 |
| **Total workforce** | **8,368** | **8,334** | **34** | **0.4** |

The number of employees increased only slightly over the course of the year. At December 31, 2016, MTU had a total workforce of 8,368.

**Vocational training 2016**

4.8 %
apprenticeship ratio

MTU invests heavily in vocational training and developing young talents. The company's apprenticeship ratio has been consistenly high over many years. In 2016 it was 4.8 % in Germany. At the end of 2016, MTU had 311 trainees, of which 15 % are women.

A particular challenge for MTU in 2016 was that of integrating refugees. MTU took a proactive stance by, in the first instance, organizing special courses for instructors to provide them with the necessary multicultural skills. Since May 2016, MTU has been preparing refugees for employment within the framework of internships.

MTU is also active in international exchange programs. 25 % of the industrial trainees are given the opportunity to swap places with a colleague in England or Poland. All students enrolled in dual study programs can gain international experience working abroad.

**Personnel and organizational development**

The multistage qualification initiative "Business Challenge" begun in 2014 for all management-level staff at MTU was continued in 2016 with the "BC II – Leadership" component. The goal of this phase of the initiative is to promote a joint management understanding, taking into account the company's strategic development, and to improve the effectiveness of management actions and the feedback and dialog culture.

Conceived as a voluntary-participation event, the Business Challenge offers managers a platform to build on their know-how, reflect on their management style and discuss with other managers from various hierarchical levels and business units.

MTU regularly carries out employee satisfaction surveys at its German locations, in order to find out where there is potential for improvement. These surveys are a key tool for further developing the corporate culture and working environment.

The results of the survey conducted at the end of 2015 show MTU's strengths – for instance the staff's belief in the company's future, the high overall level of satisfaction, the awareness of the company's goals and the employees' decision-making freedoms at work. But at the same time it also exposes the main areas that can be worked on, such as improving the efficiency of decision-making processes, guaranteeing good quality of leadership and optimizing collaboration within teams and locations.

In addition to implementing improvement measures in the individual teams, an interdivisional team from the upper management analyzes the areas for action at company level and makes recommendations on the further development of MTU.

Introduction of new Talent Management program

In 2016, a newly defined process called "Talent Management" was launched in the company. The objective of this initiative is to analyze MTU's future and overall potential and to formulate a succession plan. Key elements in it are structured categories for potential and focused indicators of potential, while "potential conferences" bring about calibrated and consensual decisions on these. In addition, the Development Center is binding for the effective furtherance and interdivisional visibility of the company's high potentials.

The Shopfloor Management that has been a fixed component within the company for many years now was given further support in 2016 in the form of center-specific development coaching. Office Management was launched in Procurement. It is a version of Shopfloor Management for administrative units.

The "Leadership Initiative" began at the Hannover location in November 2016. Participation in this program is open to all management-level staff, and it is based on "Business Challenge II". It basically consists of a number of short modules of three hours each, which makes it easy for managers to integrate it into their working day. All modules are designed to get straight to the core of their respective topic, and work is in small groups. Other modules focus on issues of particular interest to specific locations, with emphasis on topics such as the "RESPONSE Future Dialog" change process, the launch of Shopfloor Management, and healthcare.

The goal of the "RESPONSE Future Dialog" process is to ensure that the Hannover location remains competitive. To implement this process, managers were appointed as change ambassadors, and ideas were developed to ensure product neutrality across all areas of the company. The management team prepares together for the dialog with the staff, in order to emphasize the need for change at the location.

The quality of leadership has a major impact on all corporate processes. In 2016, managers at the Ludwigsfelde location took part in a management development program encompassing leadership topics such as entrepreneurial thinking, creating constructive working conditions, fostering employees and team-building, health-conscious leadership, labor law and dialog-oriented communication. Excellent leadership and a shared strategic orientation are the prerequisites for mastering the upcoming challenges at the Ludwigsfelde location.

**Compensation and employee profit-sharing**

Performance-based compensation

At MTU, employee benefits are performance-based and in line with the market across all employee groups. The performance-related variable compensation component is based on KPIs that apply to employees at all hierarchical levels. As of January 2016, the compensation system for management-level employees was aligned with that of the Executive Board.

In line with the company's policy of enabling its employees to participate in its business success, MTU once again offered an employee stock option program in 2016. New for the program in 2016 were the higher limits for the investment: After a vesting period of two years, MTU pays a bonus in the form of a matching payment based on the amount of the options held by the employee. Around 27 % of the staff participated in the scheme in 2016, with a total investment of € 14.5 million.

**Health management**

MTU continued to expand its range of on-site facilities and programs for preventing illness and improving health at all of its locations in Germany. The company offers a traditional program of health promotion in key areas such as site medical services, psychosocial counseling and local health studios, including a physiotherapy practice. This program is complemented by other programs such as vibration training close to the workplace, preventive back pain training in the workplace, training in ergonomic seating, health days for different divisions/departments, seminars on preventive health care, light meals offered by the company restaurant, and partnerships with local external fitness studios.

In addition to the tried-and-tested offerings for promoting physical health, the focus is increasingly shifting to topics such as mental health and a healthy work environment.

Managers, who bear a particular responsibility for their employees' health, receive support from MTU through awareness-raising programs as well as courses designed to enhance their health-related knowledge and enable them to take appropriate action.

Strategic analyses provide a basis of the BGM Roadmap initiative for effective, needs-based health management at MTU that pays special heed to demographic factors.

**Employer branding / personnel marketing**

Four generations currently work together on the German labor market – and hence also at MTU: the baby boomers and generations X, Y, and Z. Globalization, digitalization, a lack of skilled workers and a tangible change in values shape the modern labor market – which today more than ever is a "job applicant market." For MTU this is a clear signal to take these changes into account in what it does. The desire for a good work-life balance tops the list of what modern employees are looking for in a job. This doesn't mean salary and other financial incentives are no longer important, but factors like personal development, flexible working hours and the desire to do something meaningful at work are playing an ever-bigger role.

MTU has reacted to these wishes on the part of its current and future staff members, and has numerous employer awards to show for it:

MTU is a top employer

- Top Employer Germany ranking: MTU positioned itself well above the average of all 114 participating companies in the fields of talent strategy, performance management and leadership development. In the field of HR planning, MTU does as much for its staff as the Top 5 certified companies in Germany. Thus for another year, MTU has again shown that it meets the prerequisites for being an Employer of Choice. As well as being a highly recognizable symbol for successful HR practices, the red Top Employer certification seal also reflects a constant striving to become an even better employer.
- Top Employer Poland ranking: MTU's Polish development and production facility has achieved a top position among Polish employers for the fourth time, and excels with outstanding employer qualities in the fields of career management as well as corporate and leadership culture, among others. In 2016, the HR processes were audited on site by two representatives from the Top Employer Institute.
- British Columbia Top Employers is a subcategory of the "Canada's Top 100 Employers" benchmark, in which MTU Maintenance Canada again participated in 2016. A comparison across all participating companies showed MTU's staff training and development opportunities to be especially forward-looking. The seal, which is published each year in a special supplement of the "Vancouver Sun" newspaper also acknowledged MTU's commitment to supporting its staff through all phases of life, for example through an attractive company pension scheme.
- Germany's 100: The research institute Trendence lists MTU in 33rd place among Germany's top 100 employers in the field of engineering. The institute emphasizes in particular that the aeronautics industry attracted many young engineers in 2016.
- Universum study: In an opinion poll of nearly 45,000 German university students conducted by Universum on behalf of Wirtschaftswoche magazine, the respondents placed MTU 29th out of 50 companies in the field of engineering.

In addition to continuously participating in benchmarking studies on employer attractiveness, MTU's presence in social media such as Kununu, Xing, LinkedIn and Facebook facilitate communication with talented high-potentials. MTU is viewed very highly on these platforms compared to other industrial enterprises. Postings by current and former employees emphasize MTU's good image, the collegial atmosphere at work, the interesting range of tasks, and good wages and social welfare benefits.

**Ensuring the company's future success through diversity**

Because of societal developments such as demographic change, globalization and value shifts, diversity is playing an increasingly significant role in the company.

MTU acknowledges its responsibility to promote diversity and sees it as an immutable success factor in today's corporate world. And this is anchored in the company guidelines.

As a signatory of the Diversity Charter, MTU stands for a working environment that is free of prejudice and stereotypical ways of thinking, and it works hard to ensure that all employees are treated with respect and appreciation. This is the foundation for greater creativity and innovativeness in the company, and thus the basis for lasting success.

Another focus is on creating a working world that does justice to both men and women, without ignoring their different needs. A major goal in realizing equal opportunity for both sexes is to get women interested in technical professions and MTU, implementing support measures and constantly increasing the share of women in positions at all hierarchical levels of the company.

In the field of youth development, MTU's study foundation for outstanding female students is one of its highly successful institutions. For many years, MTU has been actively supporting women in the STEM disciplines (science, technology, engineering and mathematics) and helping them prepare for entry into the working world.

In order to further heighten its profile and attractiveness for female high potentials and executives, MTU had itself appraised by the renowned Frauenkarriereindex institute for the first time at the end of 2016, to see how it compared to other German and international companies in terms of its efforts to increase the number of women in executive positions.

→ more information available online under www.mtu.de/carreers

For more information, please take a look at the HR report 2015/2016 at http://www.mtu.de/careers/.

## Environment

For MTU, protecting the environment is not simply an obligation, but part and parcel of the responsibility it shoulders on behalf of its employees, customers, partners, neighbors, and society.

**Eco-friendly, sustainable aviation**

Numerous green initiatives

If aviation is to become more eco-friendly and sustainable, all those involved in it will have to work together closely. That is why MTU is playing an active part in numerous initiatives. The German Aerospace Industries Association (BDLI), for example, has drawn up a roadmap for the period until 2050, which defines all the necessary technologies – including alternative fuel supplies – and assigns responsibilities. While the industry focuses on addressing short- and medium-term concerns, long-term issues are more the domain of university researchers. With the support of MTU, institutes of higher education are already working on some of these topics in the context of the "eco-efficient flying" initiative of the German Federal Ministry of Economics and Technology and the EU's Breakthrough and Emerging Technologies program. The studies in progress are focusing, for example, on revolutionary work processes, innovative fuels, thermoelectric generators, the production of synthetic kerosene using solar energy, and the integration of distributed engines in aircraft. In 2016, MTU adopted a number of guiding engine concepts that describe environmentally friendly engines of the future, and that can be used to lead the way for the technological developments of the future. What is more, together with 20 other aviation companies, bioenergy producers, universities and research institutes, MTU launched the Aviation Initiative for Renewable Energy in Germany (aireg e.V.) to coordinate the introduction of alternative aviation fuels.

**Eliminating environmentally harmful production processes and materials**

MTU reduces its environmental footprint not only by complying with existing and newly introduced statutory requirements. Wherever possible, the company also refrains from using environmentally harmful materials in its production and repair processes.

Successful audit of environmental management system

IIt ensures that all production processes and techniques undergo an assessment and approval process prior to introduction and that they are subsequently enforced as standards across the company. Compliance with these standards is regularly checked and certified by internal and external audits in accordance with DIN EN ISO 14001 at the company's locations in Hannover and Ludwigsfelde, and at the Munich and Hannover locations, and since 2016 also in Ludwigsfelde, also in accordance with the European Union's EMAS (Eco-Management and Audit Scheme) Regulation (EC) No. 1221/2009. MTU's environmental management system was reviewed in 2016, as was its work safety management system at the Hannover and Ludwigsfelde locations, which complies with OHSAS 18001. MTU coordinates and enforces the requirements of the EU's REACH regulation at all its locations in Europe. The Executive Board regularly assesses the progress made in meeting environmental and work safety targets, within the framework of reviews.

**Saving resources and reducing carbon dioxide emissions**

Measures to reduce $CO_2$ emissions

MTU's production and maintenance processes also meet exacting environmental protection requirements. All locations have a comprehensive energy management system to monitor and control their consumption of electricity and gas. The same applies to the production and distribution of compressed air in the workshops of the manufacturing and maintenance facilities. The Clean Air – Industrial Site (CLAIR-IS) program was set up at MTU's headquarters in Munich in 2009. The objective of this program is to achieve a reduction of more than 30 % in $CO_2$ emissions at the Munich site by 2020 (taking 1990 as a baseline), despite steadily increasing production rates. Some of the measures taken by MTU to achieve this, in addition to installing energy-efficient lighting and power systems, and utilizing solar energy, are described below.

Non-potable groundwater drawn from wells is used as a coolant for machinery at the Munich location. That is highly efficient in terms of energy as it means that MTU no longer has to construct and run its own electric-powered cooling systems, saving the company around 3,000 metric tons of $CO_2$ every year. The increased use of building automation systems has already cut $CO_2$ emissions by some 70,000 metric tons. The cogeneration plant at the Munich site, which generates both electricity and heat, is powered using emissions-neutral vegetable oil, thus saving around 7,400 metric tons of $CO_2$ a year.

Energy efficiency and economy are given top priority when designing new buildings and renovating existing ones. Wherever possible, waste heat from production or from auxiliary plants is used to heat buildings, e.g. by means of air compressors in combination with heat pumps. The recovery of waste heat combined with additional thermal insulation on buildings mean that energy consumption is substantially lower than for conventional production facilities, saving around 1,500 tons of $CO_2$ per year since 2002. This design concept for new buildings thus achieves very low levels of resource consumption.

The vehicles used to collect and deliver in-house mail in Munich are now all-electric, resulting in savings of around 330 metric tons of $CO_2$ per year. In addition, the Munich location also participates in the city's Climate Pact Initiative, helping to launch additional projects to reduce energy consumption.

# 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 2016 have been combined in accordance with Sections 298 (2) and 315 (3) 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 2016 - 2015 | |
|---|---|---|---|---|
| in € million | 2016 | 2015 | in € million | in % |
| **Revenues** | **2,667.2** | **2,645.3** | **21.9** | **0.8** |
| Cost of sales | –2,355.1 | –2,406.6 | 51.5 | 2.1 |
| **Gross profit** | **312.1** | **238.7** | **73.4** | **30.7** |
| Selling costs | –63.4 | –47.9 | –15.5 | –32.4 |
| General administrative expenses | –40.4 | –47.5 | 7.1 | 14.9 |
| Balance of other operating income and expenses | 20.1 | –5.3 | 25.4 | >100 |
| Financial result | 144.7 | 120.7 | 24.0 | 19.9 |
| **Earnings from ordinary operating activities (operating profit)** | **373.1** | **258.7** | **114.4** | **44.2** |
| Tax expense | –101.9 | –63.6 | –38.3 | –60.2 |
| **Net profit for the year** | **271.2** | **195.1** | **76.1** | **39.0** |
| Allocations to other reserves | –135.6 | –97.5 | –38.1 | –39.1 |
| **Net profit available for distribution** | **135.6** | **97.6** | **38.0** | **38.9** |

## Revenues

Revenues in the financial year 2016 rose by € 21.9 million (0.8%) to € 2,667.2 million. This result was boosted in particular by the U.S. dollar exchange rate, which averaged 1.1069 U.S. dollars to the euro in 2016, compared with 1.1095 U.S. dollars to the euro in 2015. While revenues from manufacturing activities decreased from €2,338.2 million in 2015 to €2,285.3 million in 2016, this decrease was outweighed by the increase in revenues from MRO and other services from €256.4 million in 2015 to €292.8 million in 2016, and the increase in revenues from development projects from €50.7 million in 2015 to €55.5 million in 2016. Another major contributing factor was changes in accounting practice resulting from the application of the Accounting Directive Implementation Act (BilRUG), according to which the net proceeds of infrastructure-related and support services provided to equity investments and third parties must be now presented under revenues as of 2016. Accordingly, and in a change from 2015, in 2016 reimbursed functional costs and other items of operating income totaling €33.6 million were recognized under other revenues and thus as a component of cost of sales.

## Cost of sales and gross profit

The cost of sales was reduced by € 51.5 million to € 2,355.1 million, while gross profit thus increased at a proportionately higher rate than revenues by € 73.4 million to € 312.1 million. The gross margin amounted to 11.7% (2015: 9.0%). The main factors responsible for this increase are lower personnel expenses, resulting from the subsequent measurement of pension obligations based on new statutory requirements concerning the calculation of the discount rate. Compared with 2015, the components of cost of sales relating to company pensions decreased by € 41.8 million to € 1.2 million.

## Balance of other operating income and expenses

In the reporting period, this item mainly comprised the net income of € 9.1 million (2015: net expense of € 51.8 million) from foreign currency translation and measurement of currency holdings, and € 6.5 million (2015: € 45.3 million) recognized in respect of the amortization of prepaid expenses. This item also includes 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 improved by € 24.0 million to € 144.7 million in the financial year 2016 (2015: € 120.7 million). It includes an amount of € 174.3 million (2015: € 160.5 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 € 136.8 million (2015: € 117.4 million). An additional amount of € 18.2 million accounting profit was recognized from the capital reduction of MTU Maintenance Canada Ltd., Richmond, Canada.

In the previous year, amounts totaling € 28.6 million were recognized in respect of the dividends paid out by Vericor Power Systems LLC., Alpharetta, USA, and MTU Aero Engines North America Inc., Rocky Hill, USA.

The net interest expense improved in the reporting period, decreasing by € 4.3 million to € 34.0 million (2015: € 38.3 million), mainly as a result of lower interest expenses amounting to € 6.2 million pursuant to Section 233a of the German Tax Code (AO).

## Operating profit

The group's operating profit in 2016, at € 373.1 million, was higher by € 114.4 million than in the previous year (2015: € 258.7 million).

## Tax expense

Income taxes amounted to € 100.8 million in the financial year 2016 (2015: € 62.5 million). The current effective tax expense amounted to € 89.6 million (2015: € 114.3 million), while the deferred tax expense amounted to € 11.2 million (2015: deferred tax income of € 51.8 million). The current tax expense includes income of € 10.1 million in connection with prior years (2015: € 10.7 million).

## Net profit available for distribution

After allocation of € 135.6 million (2015: € 97.5 million) to revenue reserves in line with the resolution of the Executive Board and Supervisory Board, 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 amounted to € 135.6 million in the financial year 2016.

Net of deferred taxes, amounts totaling € 95.0 million (2015: € 60.5 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 € 38.0 million (2015: € 0.0 million) due to the changed method of determining the discount rate applicable to the measurement of pension obligations effective from 2016 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).

Proposed dividend of
€ 1.90

As the company continues to perform well, the Executive Board and Supervisory Board of MTU Aero Engines AG, Munich, will propose to the Annual General Meeting on May 4, 2017, that a dividend of € 1.90 per share (2015: € 1.70) be paid out to shareholders. This corresponds to a dividend yield of 1.7% (2015: 1.9%), based on the closing share price at year-end 2016 of € 109.80 (2015: € 90.10). On condition that the proposal is accepted, the total dividend payment will amount to € 97.6 million (2015, by resolution of the Annual General Meeting: € 86.9 million). Pending approval by the Annual General Meeting, the dividend for the financial year 2016 will be paid on May 9, 2017.

# Disclosures relating to financial situation and net asset position

Balance sheet of MTU Aero Engines AG

| | Dec. 31, 2016 | | Dec. 31, 2015 | | Change 2016 - 2015 | |
|---|---|---|---|---|---|---|
| in € million | in € million | in % | in € million | in % | in € million | in % |
| **Assets** | | | | | | |
| Intangible assets and property, plant and equipment | 1,559.6 | 31.6 | 1,480.4 | 33.8 | 79.2 | 5.3 |
| Financial assets | 867.6 | 17.6 | 827.7 | 18.9 | 39.9 | 4.8 |
| **Total assets** | **2,427.2** | **49.2** | **2,308.1** | **52.7** | **119.1** | **5.2** |
| Inventories | 884.8 | 17.9 | 878.7 | 20.1 | 6.1 | 0.7 |
| Receivables and other assets | 1,273.2 | 25.8 | 1,027.5 | 23.5 | 245.7 | 23.9 |
| Securities | 25.0 | 0.5 | 19.5 | 0.4 | 5.5 | 28.2 |
| Cash and cash equivalents | 193.5 | 3.9 | 0.2 | | 193.3 | >100 |
| **Current assets** | **2,376.5** | **48.1** | **1,925.9** | **44.0** | **450.6** | **23.4** |
| **Prepaid expenses** | **7.0** | **0.1** | **10.3** | **0.2** | **–3.3** | **–32.0** |
| **Deferred tax assets** | **129.0** | **2.6** | **133.3** | **3.1** | **–4.3** | **–3.2** |
| **Total assets** | **4,939.7** | **100.0** | **4,377.6** | **100.0** | **562.1** | **12.8** |
| **Capital** | | | | | | |
| Subscribed capital | 51.4 | 1.0 | 51.1 | 1.2 | 0.3 | 0.6 |
| Capital reserves | 393.2 | 8.0 | 378.4 | 8.6 | 14.8 | 3.9 |
| Revenue reserves | 789.9 | 16.0 | 639.0 | 14.6 | 150.9 | 23.6 |
| Net profit available for distribution | 135.6 | 2.7 | 97.6 | 2.2 | 38.0 | 38.9 |
| **Total equity** | **1,370.1** | **27.7** | **1,166.1** | **26.6** | **204.0** | **17.5** |
| Pension provisions | 568.5 | 11.5 | 577.1 | 13.2 | –8.6 | –1.5 |
| Other provisions | 1,256.3 | 25.4 | 1,075.8 | 24.6 | 180.5 | 16.8 |
| **Total provisions** | **1,824.8** | **36.9** | **1,652.9** | **37.8** | **171.9** | **10.4** |
| **Liabilities** | | | | | | |
| Bonds | 856.4 | 17.3 | 356.0 | 8.1 | 500.4 | >100 |
| Liabilities to banks | 30.1 | 0.6 | 149.2 | 3.4 | –119.1 | –79.8 |
| Advance payments received | 329.3 | 6.7 | 471.3 | 10.8 | –142.0 | –30.1 |
| Trade payables and sundry other liabilities | 347.1 | 7.0 | 408.6 | 9.3 | –61.5 | –15.1 |
| **Total liabilities** | **1,562.9** | **31.6** | **1,385.1** | **31.6** | **177.8** | **12.8** |
| **Deferred income** | **1.5** | | | | **1.5** | |
| **Deferred tax liabilities** | **180.4** | **3.8** | **173.5** | **4.0** | **6.9** | **4.0** |
| **Total equity and liabilities** | **4,939.7** | **100.0** | **4,377.6** | **100.0** | **562.1** | **12.8** |

Total assets increased by € 562.1 million (12.8%) year on year to € 4,939.7 million.

Intangible assets and property, plant and equipment increased by a total of € 79.2 million to € 1,559.6 million. In the financial year 2016, intangible assets in the amount of € 95.6 million were capitalized. Of this sum, € 5.1 million (2015: € 45.7 million) relates to the acquisition of shares in the GE9X, PW1000G and PW800 programs. Other additions to intangible assets included externally acquired development costs amounting to € 35.9 million (2015: € 58.8 million) and internally generated development costs amounting to € 53.1 million (2015: € 38.0 million) for the PW1000G engine family and for the GE9X and PW800 engine programs. Research and development expenses (recognized under cost of sales) amounted to € 68.4 million in 2016, down € 1.4 million on 2015. Altogether, MTU's total expenditure on development projects amounted to € 153.2 million (2015: € 152.2 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 2016, inventories grew slightly by € 6.1 million or 0.7% to € 884.8 million (2015: € 878.7 million), in particular to meet the requirements of new engine programs now entering the series production phase. Inventories of raw materials and supplies increased by € 0.9 million to € 83.8 million (2015: € 82.9 million), and finished products in inventory by € 35.8 million to € 331.9 million (2015: € 296.1 million), while work in progress decreased by € 36.9 million to € 447.9 million (2015: € 484.8 million). Advance payments increased by € 6.3 million to € 21.2 million (2015: € 14.9 million). Altogether, inventories accounted for 17.9% of net assets, a slightly lower ratio than in 2015 (20.1%). The sales to inventory ratio was unchanged at 3.0 (2015: 3.0).

Receivables and other assets increased by € 245.7 million year on year to € 1,273.2 million. The main items contributing to this increase relative to the previous year were accounts receivable from related companies, which rose by € 68.8 million to € 444.7 million, and accounts receivable from entities in which MTU holds an equity interest, which increased by € 160.6 million to € 389.6 million. Trade receivables decreased by € 64.5 million to € 337.0 million. Compared with the financial year 2015, other assets increased by € 80.8 million to € 101.9 million, mainly due to changes in the amount of recoverable income tax and value added tax (VAT) and the proceeds of the purchase of a promissory note amounting to € 49.0 million.

Cash and cash equivalents increased by € 193.3 to € 193.5 million. Their percentage of total assets increased to 3.9% (2015: less than 0.1%).

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 1.1 percentage points to 27.7% is primarily attributable to the net profit for 2016 of € 271.2 million.

Provisions increased by € 171.9 million to € 1,824.8 million. This figure includes pension provisions of € 568.5 million (2015: € 577.1 million), a decrease of € 8.6 million (1.5%) primarily due to the modified discount rate regime. Sundry other provisions increased year on year by € 180.5 million. The main components of this increase were the rise of € 45.2 million in the amount of cost of sales arising from the settlement of accounts not yet recognized at the reporting date, the increase in warranty obligations of € 17.3 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 € 111.7 million. Provisions for tax liabilities were € 18.8 million lower than in the previous year.

Total liabilities increased year on year by € 177.8 million to € 1,562.9 million. On the back of the placement of the convertible bond with a nominal value of € 500.0 million, as well as recognition as a liability of the pro rata interest claims of the creditors (€ 0.4 million), borrowings increased overall by € 500.4 million. While trade payables increased by € 2.8 million to € 48.4 million, liabilities to banks and the amount of advance payments received from customers decreased by € 119.1 million to € 30.1 million and by € 142.0 million to € 329.3 million, respectively. Liabilities to related companies decreased by € 17.9 million to € 19.8 million. Other liabilities, which decreased by € 46.4 million to € 278.9 million, mainly comprise liabilities arising from the acquisition of program stakes in the amount of € 93.3 million, liabilities in connection with acquired development services in the amount of € 99.3 million, and personnel-related financial liabilities amounting to € 27.6 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”).

→ further information on page 113

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 (5) 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.”

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 2017, which are prepared in accordance with the provisions of the German Commercial Code (HGB), the Executive Board expects revenues to increase compared with 2016 by around 10%, in conjunction with a pre-tax profit margin in the low double-digit percentage range.

# Forecasts

## Macroeconomic factors

The Economist Intelligence Unit (EIU) predicts a global economic growth rate of 2.5% in 2017. The U.S. economy is expected to pick up again, while Russia and Brazil are expected to reverse their recessionary trend. According to the EIU, the main risks facing the global economy in 2017 are fragile growth sustainability in China and the emerging economies, political uncertainty and declining unity in Europe, increased interest rates in the U.S., and the geopolitical situation.

Among the industrialized nations, North America has the best starting position, with rapid employment growth, rising wages, low inflation and a turn in the inventory cycle likely to boost the economy. The EIU's experts expect growth in this region of 2.3% in 2017.

In the eurozone, growth looks likely to settle at 1.5% in 2017. The main focus will be on the restructuring of the EU and preparing for the U.K.'s Brexit negotiations.

China's economic realignment continues, with GDP estimated to grow by 6.2% in 2017. The EIU forecast thus deviates from the 6.5% target set by the Chinese government in Beijing.

## Microeconomic factors in the aviation industry

Industry continues to grow

The International Air Transport Association IATA estimates that global air transport will increase by 5.1% in 2017. In order to meet this demand, Airbus has announced that it will deliver more than 700 aircraft in 2017; Boeing has announced 760 to 765. With a figure in excess of 1,460, deliveries would thus be higher than in 2016 (1,436 aircraft).

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.

For 2017, the EIU is expecting the price of a barrel of Brent crude oil to rise to U.S. $ 53 (2016: U.S. $ 43). Increasing passenger numbers and the persistent low oil prices currently ensure the full capacity utilization of the existing fleet. Over the medium term, the price for a barrel of Brent crude is likely to remain at less than U.S. $ 100.

Oil prices are not expected to rise significantly in the foreseeable future, given the slowing demand growth in emerging economies, the mining of shale oil in the U.S. and the advance of renewable energy sources.

## Future development of MTU

The statements below are based on the knowledge available at the beginning of 2017. 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, calls 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 2017

**Targets**
MTU's targets for the financial year 2017 are as follows:

Outlook for 2017

| in € million | Forecast for 2017 | Actual 2016 |
|---|---|---|
| Revenues | 5,100 - 5,200 | 4,732.7 |
| Adjusted EBIT margin (adjusted EBIT / revenues) | Stable | 10.6% |
| Adjusted earnings after tax | Stronger increase than adjusted EBIT | 345.4 |
| Cash conversion rate (free cash flow / adjusted earnings after tax) | Lower double-digit percentage | 23.7% |

The company expects its revenues, earnings and free cash flow to continue rising in 2017.

**Revenues by operating segment**

Growth in the commercial engine business

In the commercial engine business, MTU expects to see an increase in revenues in 2017, both from engine manufacturing activities and from spare parts sales. This business unit is expected to grow in U.S. dollar terms by a percentage in the mid-to-high single-digit range.

Revenues in the military engine business are expected to decrease by a percentage in the high single digits.

These assumptions are based on the rising number of deliveries under the PW1000G programs, whereas deliveries of the V2500 for the current A320 family and of the GP7000 for the Airbus A380 are expected to decline. The increase in revenues from spare parts sales derives principally from the V2500 program. In the military engine business, deliveries of EJ200 engines for the Eurofighter jet are expected to decrease.

Identified risks in the OEM segment relate to the possibility of delays in ramping up the new engine programs.

MTU's revenue forecast for its commercial maintenance business (MRO segment) in 2017 is for a growth rate of approximately 10% in U.S.-dollar terms. Demand is expected to rise, for example, in connection with the V2500 and CF34 programs.

**Operating profit**

Stable EBIT margin expected

MTU expects its operating profit (adjusted EBIT) to increase in 2017 compared with 2016. The adjusted EBIT margin (adjusted EBIT / revenues) is expected to remain stable (2016: 10.6%). Changes in the product mix in the commercial new engine and maintenance businesses are 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 and by positive currency translation effects.

**Adjusted earnings after tax (adjusted EAT)**

In 2017, adjusted earnings after tax are expected to grow at a higher rate than EBIT, due to the probable decrease in the net interest expense.

**Free cash flow**

2017 will be another year of substantial investment spending and a further reduced level of advance payments in the military engine business. However, MTU plans to compensate for these effects through its operating activities and achieve a free cash flow conversion rate (ratio of free cash flow to adjusted earnings after tax) in the lower double-digit percentage range.

**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 2017, 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 2017. This mainly concerns the MTU locations in Poland, Hannover 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 2017, 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 and high-pressure compressor, with a view to reducing fuel consumption and emissions. A detailed report on research and development activities in 2016, 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 2017

The MTU Executive Board remains optimistic that it will be able to profitably expand the company's business in 2017, leading to a further increase in revenues, 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 2017 will provide a sound basis for the sustained long-term growth of MTU's business. In 2017, it is expected that the commercial engine business will continue to drive future growth.

# 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, which describe it as a means of facilitating teamwork and promoting constructive behavioral attitudes. The logical consequence of striving for continuous improvement is the establishment of a Continuous Improvement Project (CIP), which aims to encourage employees to deal openly with weak points 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 ward off risks to MTU's status as a going concern and to safeguard the company's future business success and create a transparent risk position. MTU does not limit itself to ensuring compliance with statutory requirements. It has integrated its corporate risk and opportunity management system into all financial processes, from operational and strategic planning, to regular forecasting processes, right through to monthly reporting to the Executive Board and the Supervisory Board. Risk management is also a part of all control processes, 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.

Operational risk management takes place at the level of the individual 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 risk maps. 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 "adjusted EBIT" 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 (Brexit / U.S. presidential election), in order to identify potential risks. Political crises in some regions and restrictions on air travel imposed as a result of 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, national budget cuts could negatively impact the military engine business. 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.

So the MTU fields of business will not be affected 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; it will 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 cannot be ruled out, so it considers this risk to be non-critical.

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 spare parts sales. Many airlines are still experiencing financial difficulties, especially as a result of competitive pressure in the aviation market. 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 to improve their profit margins. For example, they may delay shop visits or replace defective parts or entire engines with used ones instead of new ones.

The market has also changed for new engine programs, to the extent that the engine manufacturers sell their engines with maintenance packages. So, success no longer depends solely on spare-part sales, but on the ability to forecast the volume of maintenance services including the supply of spare parts.

Owing to the difficult financial situation of some airlines, 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 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 made available to the aircraft manufacturer 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.

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, 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 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.

From today's standpoint, MTU 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. But as the market launch of the GTF engines demonstrates, there is always a residual risk – even when all possible risk minimization measures are implemented.

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 limiting liability risks and taking out insurance cover, the risks are rendered transparent and manageable. MTU has not identified any risks related to its production, development or procurement 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, 2016, the value of the portfolio of hedging instruments with terms until 2017 amounted to U.S. $ 1,680.0 million (which translates to € 1,593.8 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).

→ further information on page 208

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").

→ further information on page 81

## 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 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.

**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 performance indicators." 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.

→ further information on page 93

**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 at the present time.

**Personnel risks**

The shortage of skilled workers brought about 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**

The legal proceedings currently pending do not present any risks that might endanger MTU's continued existence as a going concern. Identifiable risks arising from pending tax audits or ongoing customs audits have been taken into account in the financial statements where necessary.

## 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. In the assessment of MTU's top categories of measurable risk exposure in the financial year 2017, the following risk position results:

Measurement of the MTU group's risk exposure

| in € million | OEM | MRO |
|---|---|---|
| Market and program risks | 17.4 | 13.2 |
| Risks associated with product development and manufacturing | 2.3 | ./. |
| Other risks pertaining to business operations | ./. | 6.7 |

The group considers it extremely improbable that all these risks might arise concurrently. Therefore, aggregated figures must be viewed merely as a rough indication of MTU's overall risk exposure. Beyond the horizon of 2017, there is the possibility that the company may be exposed to other identifiable, in some cases significant, risk factors, which MTU is continuously monitoring and has integrated in its short to medium term planning and risk management processes.

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 € 75 million. However, these cash outflows are covered by the company's existing lines of credit. No other measurable risks have been identified over and above those previously mentioned.

At December 31, 2016, there had been no substantial changes in MTU's risk exposure compared with the end of the previous year. 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. The technologies developed by MTU have been successfully integrated into new engine programs in recent years. 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 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 partnership 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 but also for the MTR390 and TP400-D6 – present opportunities to acquire new customers for military business. 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 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 opens up 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.

The establishment of two joint ventures with Sumitomo Corporation in the field of engine leasing and the founding of a new company for engine leasing with the partner companies in the PW1100G-MRO network, are designed to extend the activities in the lucrative leasing business, and to increase the scope of services provided in the aftermarket.

## 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 entails 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.

→ further information on page 113

Other opportunities are listed in the SWOT analysis. 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, 2016, 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. With the exception of market and program opportunities in the MRO segment amounting to € 1.1 million, no other quantifiable opportunities have been identified in respect of 2017 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 major 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<br>– OEM: Low-pressure turbine and high-pressure compressor (2-module strategy)<br>– 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 | 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<br>– Price competition in maintenance<br>– Market-entry barriers for OEMs (licenses)<br>– 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 aircraft engine technology |
| Higher wage levels at the traditional manufacturing sites | Additional development costs and contractual penalties due to technical difficulties with new engine types |
| | Negative changes in U.S. dollar exchange rate |

# 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, analytical checks, and programmed plausibility checks during payment cycles 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.

- Accounting-relevant processes are also 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 specific reporting issues – such as questions concerning the balance sheet – 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 315 (4) of the German Commercial Code (HGB) (takeover directive implementation). Items of Section 315 (4) 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, 2016, MTU held 643,879 treasury shares (2015: 881,276). 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 the reporting period, 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).

**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 listed bond in June 2012, a registered bond in June 2013 and a note purchase agreement in March 2014. All of 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 October 2016), 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 32

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

→ further information on page 32

A full description of management practices that extend beyond statutory requirements is provided in the corporate governance report published as part of this 2016 Annual Report.

### Working procedures of the Executive Board and the Supervisory Board

→ further information on page 32

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

### 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, in order to comply with the requirements of this law, the proportion of women holding seats on the Supervisory Board of MTU Aero Engines AG will be gradually increased to at least 30 % as and when positions are vacated and refilled. This proportion currently stands at 16.7 %. Secondly, the overall proportion of women in leadership positions (i.e. in all tiers of management with the exception of the Executive Board) at the company’s three locations in Germany will be increased to 11 % by June 2017, up from 9.7 % at the reference date of June 30, 2016. There are no plans to change the composition of the Executive Board of MTU Aero Engines AG or of the supervisory boards and executive management teams of MTU Maintenance Hannover GmbH, Langenhagen, Germany, and MTU Maintenance Berlin-Brandenburg GmbH, Ludwigsfelde, Germany, before June 2017.

## Reference to management compensation report

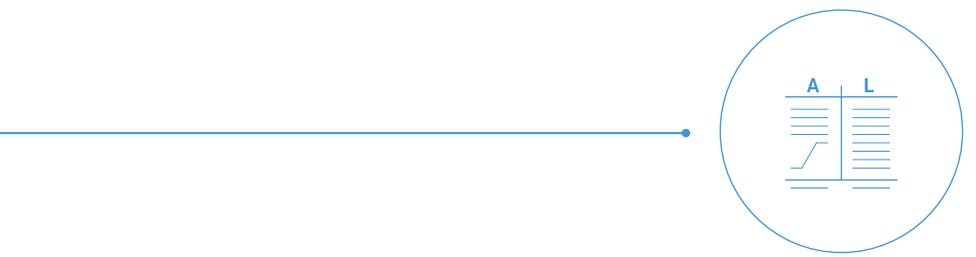
The compensation awarded to members of the Executive Board is made up of fixed and variable components. A more detailed description, including a table of individual members’ compensation entitlements, can be found in the corporate governance section of this Annual Report. The management compensation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

→ further information on page 38

## 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, 2016, equaled less than 1% of the company's share capital (at December 31, 2015, less than 1%).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# Consolidated financial statements



## Notes to the consolidated financial statements

# Consolidated income statement

Consolidated income statement

| in € million | (Note) | 2016 | 2015 |
|---|---|---|---|
| **Revenues** | **(1.)** | **4,732.7** | **4,435.3** |
| Cost of sales | (2.) | –4,074.8 | –3,855.0 |
| **Gross profit** | | **657.9** | **580.3** |
| Research and development expenses | (3.) | –71.1 | –66.5 |
| Selling expenses | (4.) | –104.0 | –94.3 |
| General administrative expenses | (5.) | –70.8 | –65.6 |
| Other operating income | (6.) | 17.2 | 14.6 |
| Other operating expenses | (6.) | –7.1 | –13.6 |
| Profit/loss of companies accounted for using the equity method | (7.) | 28.6 | 29.1 |
| Profit/loss of companies accounted for at cost | (7.) | 2.1 | 1.6 |
| **Earnings before interest and tax (EBIT)** | | **452.8** | **385.6** |
| Interest income | | 0.8 | 2.4 |
| Interest expenses | | –12.7 | –3.5 |
| Interest result | (8.) | –11.9 | –1.1 |
| Financial result on other items | (9.) | –25.3 | –63.7 |
| **Financial result** | | **–37.2** | **–64.8** |
| **Earnings before tax** | | **415.6** | **320.8** |
| Income taxes | (10.) | –103.0 | –103.2 |
| **Earnings after tax** | | **312.6** | **217.6** |
| Thereof: | | | |
| Shareholders of MTU Aero Engines AG | | 312.2 | 217.6 |
| Shares of non-controlling interest | | 0.4 | 0.0 |
| | | | |
| **Earnings per share in €** | | | |
| Basic (EPS) | (11.) | 6.09 | 4.26 |
| Diluted (DEPS) | (11.) | 5.83 | 4.26 |

# Consolidated statement of comprehensive income

Consolidated statement of comprehensive income

| in € million | (Note) | 2016 | 2015 |
|---|---|---|---|
| **Earnings after tax** | | **312.6** | **217.6** |
| Exchange differences arising from the translation of financial statements of foreign operations | | –5.5 | 12.7 |
| Financial instruments designated as cash flow hedges | | –1.6 | –42.8 |
| **Items that may subsequently be recycled to profit or loss** | | **–7.1** | **–30.1** |
| Actuarial gains and losses on pension obligations and plan assets | | –54.3 | –10.5 |
| **Items that will not be recycled to profit or loss** | | **–54.3** | **–10.5** |
| **Other comprehensive income** | **(24.)** | **–61.4** | **–40.6** |
| **Total comprehensive income** | | **251.2** | **177.0** |
| Thereof attributable to: | | | |
| Owners of MTU Aero Engines AG | | 250.8 | 177.0 |
| Non-controlling interests | | 0.4 | 0.0 |

# Consolidated balance sheet – assets

Assets

| in € million | (Note) | Dec. 31, 2016 | Dec. 31, 2015 |
|---|---|---|---|
| **Non-current assets** | | | |
| Intangible assets | (14.) | 2,234.2 | 2,214.0 |
| Property, plant and equipment | (15.) | 681.5 | 632.0 |
| Financial assets accounted for using the equity method | (16.) | 201.9 | 168.0 |
| Other financial assets | (16.) | 130.2 | 85.2 |
| Other assets | (20.) | 2.0 | 3.2 |
| Deferred tax assets | (33.) | 56.6 | 42.0 |
| **Total non-current assets** | | **3,306.4** | **3,144.4** |
| **Current assets** | | | |
| Inventories | (17.) | 1,022.7 | 894.0 |
| Trade receivables | (18.) | 692.1 | 708.5 |
| Construction contract and service business receivables | (19.) | 393.2 | 301.3 |
| Recoverable income taxes | (22.) | 21.1 | |
| Other financial assets | (16.) | 42.9 | 54.8 |
| Other assets | (20.) | 43.8 | 32.2 |
| Cash and cash equivalents | (21.) | 322.4 | 53.1 |
| **Total current assets** | | **2,538.2** | **2,043.9** |
| **Total assets** | | **5,844.6** | **5,188.3** |

# Consolidated balance sheet – equity and liabilities

Equity and liabilities

| in € million | (Note) | Dec. 31, 2016 | Dec. 31, 2015 |
|---|---|---|---|
| **Equity** | **(24.)** | | |
| Subscribed capital | | 52.0 | 52.0 |
| Capital reserves | | 435.5 | 404.7 |
| Revenue reserves | | 1,370.9 | 1,145.6 |
| Treasury shares | | –25.3 | –30.1 |
| Other comprehensive income | | –332.8 | –271.4 |
| **Shareholders of MTU Aero Engines AG** | | **1,500.3** | **1,300.8** |
| Shares of non-controlling interests | | 0.2 | –0.2 |
| **Total equity** | | **1,500.5** | **1,300.6** |
| | | | |
| **Non-current liabilities** | | | |
| Pension provisions | (25.) | 860.6 | 777.5 |
| Other provisions | (27.) | 23.4 | 24.8 |
| Financial liabilities | (28.) | 1,056.4 | 910.2 |
| Deferred tax liabilities | (33.) | 23.5 | 22.7 |
| **Total non-current liabilities** | | **1,963.9** | **1,735.2** |
| | | | |
| **Current liabilities** | | | |
| Pension provisions | (25.) | 22.7 | 24.2 |
| Income tax liabilities | (26.) | 6.8 | 31.1 |
| Other provisions | (27.) | 684.3 | 495.2 |
| Financial liabilities | (28.) | 645.2 | 512.0 |
| Trade payables | (29.) | 634.9 | 673.4 |
| Construction contract and service business payables | (30.) | 344.2 | 373.8 |
| Other liabilities | (31.) | 42.1 | 42.8 |
| **Total current liabilities** | | **2,380.2** | **2,152.5** |
| | | | |
| **Total equity and liabilities** | | **5,844.6** | **5,188.3** |

# Consolidated statement of changes in equity

Consolidated statement of changes in equity

| in € million | Subscribed capital | Capital reserves | Revenue reserves | Treasury shares | Other comprehensive income: Translation differences arising from the financial statements of international entities | Other comprehensive income: Actuarial gains and losses [1] | Other comprehensive income: Financial instruments designated as cash flow hedges | **Shareholders of MTU Aero Engines AG** | Shares of non-controlling interest | **Total equity** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Carrying amount at Jan. 1, 2015** | **52.0** | **397.5** | **1,002.0** | **–32.2** | **18.0** | **–193.9** | **–54.9** | **1,188.5** | **–0.2** | **1,188.3** |
| Earnings after tax | | | 217.6 | | | | | 217.6 | 0.0 | 217.6 |
| Other comprehensive income | | | | | 12.7 | –10.5 | –42.8 | –40.6 | | –40.6 |
| **Total comprehensive income** | | | **217.6** | | **12.7** | **–10.5** | **–42.8** | **177.0** | **0.0** | **177.0** |
| Dividend payment | | | –74.0 | | | | | –74.0 | | –74.0 |
| MAP employee stock option program | | 6.9 | | 2.0 | | | | 8.9 | | 8.9 |
| Share Matching Plan | | 0.3 | | 0.1 | | | | 0.4 | | 0.4 |
| **Carrying amount at Dec. 31, 2015** | **52.0** | **404.7** | **1,145.6** | **–30.1** | **30.7** | **–204.4** | **–97.7** | **1,300.8** | **–0.2** | **1,300.6** |
| Earnings after tax | | | 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** |

[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) | 2016 | 2015 |
|---|---|---|---|
| **Operating activities** | | | |
| **Earnings after tax** | | **312.6** | **217.6** |
| Depreciation / appreciation, amortization and impairment of non-current assets | | 175.3 | 163.2 |
| Profit / loss of companies accounted for using the equity method | | –28.6 | –29.1 |
| Profit / loss of companies accounted for at cost | | –2.1 | –1.6 |
| Gains / losses on the disposal of assets | | –3.8 | –0.1 |
| Change in pension provisions | (25.) | 1.7 | 4.1 |
| Change in other provisions | (27.) | 187.7 | 148.5 |
| Other non-cash items | | 37.3 | 75.7 |
| Change in working capital | | –291.6 | –255.0 |
| Interest result | (8.) | 11.9 | 1.1 |
| Interest paid | | –15.2 | –13.5 |
| Interest received | | 0.8 | 2.4 |
| Dividends received | | 15.1 | 15.7 |
| Income taxes | (10.) | 103.0 | 103.2 |
| Income taxes paid | | –146.1 | –136.0 |
| **Cash flow from operating activities** | | **358.0** | **296.2** |
| **Investing activities** | | | |
| Capital expenditure on: | | | |
| Intangible assets | (14.) | –108.1 | –142.8 |
| Property, plant and equipment | (15.) | –159.4 | –129.9 |
| Financial assets | (16.) | –99.6 | –49.0 |
| Proceeds from disposal of: | | | |
| Intangible assets / property, plant and equipment | (14.)/(15.) | 4.7 | 4.5 |
| Financial assets | (16.) | 48.4 | 49.4 |
| **Cash flow from investing activities** | | **–314.0** | **–267.8** |
| **Financing activities** | | | |
| Proceeds from convertible bond[1)] | (28.) | 495.3 | |
| Increase in financial liabilities | (28.) | | 109.4 |
| Repayment of financial liabilities | (28.) | –120.4 | –1.3 |
| Dividend payment | | –86.9 | –74.0 |
| Sale of shares under the MAP employee stock option program | (28.) | 14.5 | 9.3 |
| Settlement of contingent purchase price liability for PW1000G program shares, PW 800 program shares, V2500 stake increase | | –79.2 | –86.1 |
| **Cash flow from financing activities** | | **223.3** | **–42.7** |
| **Net change in cash and cash equivalents during the year** | | **267.3** | **–14.3** |
| Effect of translation differences on cash and cash equivalents | | 2.0 | 2.8 |
| Cash and cash equivalents at beginning of financial year (January 1) | | 53.1 | 64.6 |
| **Cash and cash equivalents at end of financial year (December 31)** | | **322.4** | **53.1** |

1) After transaction costs

# Reporting by operating segment

Reporting by operating segment

| in € million | Commercial and military engine business (OEM) 2016 | 2015 |
|---|---|---|
| External revenues | 2,871.0 | 2,861.9 |
| Revenues from intersegment sales | 34.2 | 35.2 |
| **Total revenues** | **2,905.2** | **2,897.1** |
| **Gross profit** | **422.6** | **378.9** |
| Amortization | 65.5 | 59.7 |
| Depreciation | 76.2 | 74.5 |
| Impairment loss | | |
| **Total depreciation / amortization and impairment losses** | **141.7** | **134.2** |
| **Earnings before interest and tax (EBIT)** | **273.7** | **232.8** |
| Depreciation / amortization effects of purchase price allocation | 18.7 | 21.6 |
| IAE-V2500 stake increase | 29.1 | 30.6 |
| **Adjusted earnings before interest and tax (adjusted EBIT)** | **321.5** | **285.0** |
| Profit / loss of companies accounted for using the equity method | 1.1 | –2.4 |
| Carrying amount of companies accounted for using the equity method | 55.8 | 27.6 |
| **Assets** | **5,115.6** | **4,589.5** |
| **Liabilities** | **3,758.8** | **3,429.4** |
| **Significant non-cash items** | **33.7** | **76.4** |
| **Capital expenditure:** | | |
| Intangible assets | 114.3 | 160.9 |
| Property, plant and equipment | 112.1 | 102.9 |
| **Capital expenditure on intangible assets and on property, plant and equipment** | **226.4** | **263.8** |
| **Key segment data:** | | |
| EBIT in % of revenues | 9.4 | 8.0 |
| Adjusted EBIT in % of revenues | 11.1 | 9.8 |

The key indicator used by management to measure the operating performance of each segment is adjusted earnings before interest and tax (adjusted EBIT). The contribution of associated companies and joint ventures accounted for using the equity method to adjusted EBIT amounted to € 28.6 million in the financial year 2016 (2015: € 29.1 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 translation differences recognized in other comprehensive income.

| Commercial maintenance business (MRO) | | Total reportable segments | | Consolidation / reconciliation | | MTU group | |
|---|---|---|---|---|---|---|---|
| **2016** | 2015 | **2016** | 2015 | **2016** | 2015 | **2016** | 2015 |
| 1,861.7 | 1,573.4 | 4,732.7 | 4,435.3 | | | 4,732.7 | 4,435.3 |
| 52.7 | 7.2 | 86.9 | 42.4 | –86.9 | –42.4 | | |
| **1,914.4** | **1,580.6** | **4,819.6** | **4,477.7** | **–86.9** | **–42.4** | **4,732.7** | **4,435.3** |
| **234.8** | **201.1** | **657.4** | **580.0** | **0.5** | **0.3** | **657.9** | **580.3** |
| 10.6 | 10.1 | 76.1 | 69.8 | | | 76.1 | 69.8 |
| 25.2 | 23.3 | 101.4 | 97.8 | | | 101.4 | 97.8 |
| 0.1 | 0.4 | 0.1 | 0.4 | | | 0.1 | 0.4 |
| **35.9** | **33.8** | **177.6** | **168.0** | | | **177.6** | **168.0** |
| **179.1** | **152.7** | **452.8** | **385.5** | | **0.1** | **452.8** | **385.6** |
| 2.4 | 2.5 | 21.1 | 24.1 | | | 21.1 | 24.1 |
| | | 29.1 | 30.6 | | | 29.1 | 30.6 |
| **181.5** | **155.2** | **503.0** | **440.2** | | **0.1** | **503.0** | **440.3** |
| 27.5 | 31.5 | 28.6 | 29.1 | | | 28.6 | 29.1 |
| 146.1 | 140.4 | 201.9 | 168.0 | | | 201.9 | 168.0 |
| **1,479.6** | **1,273.2** | **6,595.2** | **5,862.7** | **–750.6** | **–674.4** | **5,844.6** | **5,188.3** |
| **994.8** | **791.7** | **4,753.6** | **4,221.1** | **–409.5** | **–333.4** | **4,344.1** | **3,887.7** |
| **3.6** | **–0.5** | **37.3** | **75.9** | | **–0.2** | **37.3** | **75.7** |
| 1.1 | 18.9 | 115.4 | 179.8 | | | 115.4 | 179.8 |
| 47.3 | 27.0 | 159.4 | 129.9 | | | 159.4 | 129.9 |
| **48.4** | **45.9** | **274.8** | **309.7** | | | **274.8** | **309.7** |
| 9.4 | 9.7 | 9.4 | 8.6 | | | 9.6 | 8.7 |
| 9.5 | 9.8 | 10.4 | 9.8 | | | 10.6 | 9.9 |

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 | 2016 | 2015 |
|---|---|---|
| **Commercial engine business** | | |
| Manufacturing | 2,261.5 | 2,326.7 |
| Other products | 139.7 | 87.3 |
| **Total commercial engine business** | **2,401.2** | **2,414.0** |
| **Military engine business** | | |
| Manufacturing | 298.8 | 298.2 |
| Other products | 205.2 | 184.9 |
| **Total military engine business** | **504.0** | **483.1** |
| **Total commercial and military engine business (OEM)** | **2,905.2** | **2,897.1** |
| **Commercial maintenance business (MRO)** | | |
| Engine maintenance, repair and overhaul | 1,657.2 | 1,367.3 |
| Other products | 257.2 | 213.3 |
| **Total commercial maintenance business (MRO)** | **1,914.4** | **1,580.6** |
| Consolidation | –86.9 | –42.4 |
| **Total revenues** | **4,732.7** | **4,435.3** |

In the OEM segment (commercial and military engine business), other products refers 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 and the activities of Vericor Power Systems LLC., Alpharetta, USA, and MTU Maintenance Lease Services B.V., Amsterdam, Netherlands.

## 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 first customer led to revenues of € 1,609.3 million (2015: € 1,201.7 million), with the second € 940.4 million (2015: € 984.8 million) and with the third € 537.1 million (2015: € 638.9 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 | 2016 | 2015 |
|---|---|---|
| Germany | 518.8 | 483.7 |
| Europe | 330.7 | 300.3 |
| North America | 3,495.2 | 3,256.7 |
| Asia | 199.4 | 155.8 |
| Other regions | 188.6 | 238.8 |
| **Total revenues** | **4,732.7** | **4,435.3** |

In 2016, approximately 74% (2015: 73%) of MTU's revenues were generated from business with customers in North America, of which the U.S. market accounted for a share of 70% (2015: 71%).

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

| in € million | 2016 | 2015 |
|---|---|---|
| Germany | 239.0 | 293.2 |
| Europe | 31.8 | 14.1 |
| North America | 4.0 | 2.4 |
| **Total capital expenditure** | **274.8** | **309.7** |

Approximately 87% (2015: approximately 95%) 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 | 2016 | 2015 |
|---|---|---|
| Germany | 2,526.0 | 2,376.9 |
| Europe | 723.4 | 743.4 |
| North America | 57.0 | 24.1 |
| **Total non-current assets** | **3,306.4** | **3,144.4** |

# Reconciliation of segment information with MTU consolidated financial statements

Reconciliation of segment information with MTU consolidated financial statements - earnings

| in € million | 2016 | 2015 |
|---|---|---|
| **Consolidated earnings before interest and tax (EBIT)** | **452.8** | **385.6** |
| Interest income | 0.8 | 2.4 |
| Interest expenses | –12.7 | –3.5 |
| Financial result on other items | –25.3 | –63.7 |
| **Earnings before tax** | **415.6** | **320.8** |

The cash and cash equivalents belonging to the assets 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.

# I. Accounting policies and principles

## Fundamentals and methods

MTU Aero Engines AG, Munich, together with its consolidated group of companies (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 logistical support for commercial engines.

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 20, 2017.

MTU's consolidated financial statements have been drawn up in accordance with International Financial Reporting Standards (IFRS), such as they apply in the European Union (EU), and the supplementary requirements of Section 315a (1) of the German Commercial Code (HGB). All IFRS issued by the International Accounting Standards Board (IASB) that were effective at the time these consolidated financial statements were drawn up and that were applied by MTU have been endorsed by the European Commission for use in the EU.

The consolidated financial statements as at December 31, 2016 and the combined management report for the financial year 2016 have been compiled in accordance with Section 315a (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. Uniform methods of recognition and measurement are applied throughout the group.

## Accounting standards and interpretations, and revised/amended accounting standards and interpretations, applied for the first time in the financial year 2016

The following accounting standards and interpretations, and revised/amended accounting standards and interpretations, were applied for the first time in the 2016 financial statements:

New amendments and standards

| Standard | Title |
|---|---|
| IFRS 10 / IFRS 12 / IAS 28 | Amendments to Investment Entities: Applying the Consolidation Exception |
| IFRS 11 | Amendments to Accounting for Acquisitions of Interests in Joint Operations |
| IAS 1 | Amendments to Disclosure Initiative |
| IAS 16 / IAS 38 | Amendments to Clarification of Acceptable Methods of Depreciation and Amortization |
| IAS 16 / IAS 41 | Amendments to Agriculture: Bearer Plants |
| IAS 19 | Amendments to Defined Benefit Plans: Employee Contributions |
| IAS 27 | Amendments to Equity Method in Separate Financial Statements |
| Annual improvements to IFRS 2010 – 2012 | IFRS 2 – Share-based Payment<br>IFRS 3 – Business Combinations<br>IFRS 8 – Operating Segments<br>IFRS 13 – Fair Value Measurement<br>IAS 16 – Property, Plant and Equipment<br>IAS 24 – Related Party Disclosures |
| Annual improvements to IFRS 2012 – 2014 | IFRS 5 – Non-current Assets Held for Sale<br>IFRS 7 – Financial Instruments: Disclosures<br>IAS 19 – Discount Rate for Employee Benefits<br>IAS 34 – Interim Financial Reporting (Inclusion of cross-references) |

However, their application did not result in any significant changes to MTU's financial reporting processes.

## 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, 2016:

New and amended standards and interpretations

| Standard | Title |
|---|---|
| IFRS 2 | Amendments to Classification and Measurement of Share-Based Payment Transactions [2) 4)] |
| IFRS 4 | Amendments to Applying IFRS 9 Financial Instruments with IFRS 4 Insurance Contracts [2) 4)] |
| IFRS 9 | Financial Instruments [2)] |
| IFRS 15 | Revenue from Contracts with Customers [2)] |
| IFRS 15 | Clarification of Revenue from Contracts with Customers [2) 4)] |
| IFRS 16 | Leases [3) 4)] |
| IAS 7 | Amendments to Disclosure Initiative [1) 4)] |
| IAS 12 | Amendments to Recognition of Deferred Tax Assets for Unrealised Losses 1) 4) |
| IAS 40 | Amendments to Transfers of Investment Property [2) 4)] |
| IFRIC 22 | Foreign Currency Transactions and Advance Consideration [2) 4)] |
| Annual improvements to IFRS 2014 – 2016 | IFRS 1 First-time Adoption of International Financial Reporting Standards [2) 4)]<br>IFRS 12 Disclosure of Interests in Other Entities [1) 4)]<br>IAS 28 Investments in Associates and Joint Ventures [2) 4)] |

[1)] Effective for annual periods beginning on or after January 1, 2017.
[2)] Effective for annual periods beginning on or after January 1, 2018.
[3)] Effective for annual periods beginning on or after January 1, 2019.
[4)] 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 methods of reporting used in future reporting periods.

**IFRS 9, Financial Instruments**
The version of IFRS 9, Financial Instruments, issued in June 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 paradigm shift away from the incurred loss model in IAS 39. The new expected 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.

In accordance with the transitional provisions, MTU is not currently planning to adjust prior period figures and intends to recognize transition effects cumulatively under revenue reserves.

MTU expects no significant impact on the net assets, financial situation or operating results from initial application of IFRS 9.

**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 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). IFRS 15 has been endorsed for use in the European Union, therefore earlier application would be permitted.

In mid-April 2016, the International Accounting Standards Board (IASB) published additional final amendments to IFRS 15, which 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). However, the amendments have not yet been endorsed by the EU.

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 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.
- Consideration payable to customers is usually accounted for as a reduction of revenue. In the future, these costs may only be capitalized (e.g. as an intangible asset) if the payment to the customer is in exchange for a distinct good or service that clearly is not linked to the individual engine program.
- 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 disclosures in their consolidated financial statements.

In 2016, MTU continued the process of evaluating the concrete impact of applying revenue recognition requirements under IFRS 15 based on an analysis of customer contracts. On this basis and given the ongoing technical discussions among preparers in the aerospace industry, MTU currently anticipates the following impacts, which are subject to change in the period up to first-time adoption:

#### Commercial engine business

Expenses for marketing engines based on indirect payments to airlines and leasing companies have previously been recognized under cost of sales. Under IFRS 15, such payments may qualify as consideration payable to the customer, and consequently upon sale of the engines would have to be recognized as a reduction of revenue. This change could result in a significant decrease in the amount of revenues reported in the commercial engine business; however, it would not affect absolute earnings realized. This adjustment would lead to an increase in the group EBIT margin (adjusted EBIT relative to group revenues) in 2016 of almost 3 %.

Program assets and compensation for development costs payable to the consortium leader (OEM) within the scope of commercial engine program participations are currently capitalized as intangible assets and amortized on a straight-line basis over their useful lives / lifetime of the program. Such payments may qualify under IFRS 15 as consideration payable to the customer, requiring them to be recognized under other assets. In accordance with IFRS 15, these payments would be amortized over the period in which revenues are realized from the respective engine program and reflected as a reduction of revenue.

#### Commercial maintenance business (MRO)

In the commercial maintenance business, the group overhauls and repairs aircraft engines and industrial gas turbines. Revenue in this segment is recognized in consideration of the customer-specific service character over the period of the respective overhaul/maintenance/repair (shop visit). Based on the analyses performed up to the reporting date, which are not yet completed, MTU currently does not identify any compelling need in the commercial maintenance business to make revenue recognition adjustments in accordance with IFRS 15.

#### Military engine business

Revenue generated through military engine programs is currently recognized for the individual programs using the percentage-of-completion method. Based on the analyses performed up to the reporting date, which are not yet completed, MTU currently does not identify any compelling need in the military engine business, apart from the measurement of percentage of completion, to make revenue recognition adjustments in accordance with IFRS 15.

Initial application

No final decision has yet been taken in respect of whether MTU will adopt IFRS 15 using a fully retrospective approach or a modified retrospective approach.

**IFRS 16, Leases**

IFRS 16 redefines how an IFRS reporter recognizes, measures, presents and discloses leases. 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 the differentiation between financing 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. An MTU project is in course to investigate the consequences of this change.

Initial application

No final decision has yet been taken in respect of whether MTU will adopt IFRS 15 using a fully retrospective approach or a modified retrospective approach.

**Invocation 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, and for which the consolidated financial statements of MTU Aero Engines AG, Munich, constitute the exempting consolidated financial statements, have invoked the provisions of Section 264 (3) of the German Commercial Code (HGB). The official notice of these companies' invocation of the exemption was published in the electronic version of the Federal Gazette (Bundesanzeiger) in the name of MTU Aero Engines GmbH, Munich, on November 22, 2016.

## Group reporting entity

At December 31, 2016, the MTU group including MTU Aero Engines AG, Munich, comprised 31 companies (unchanged from 2015). 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 group reporting entity. The assets of MTU München Unterstützungskasse GmbH, Munich, are classified as plan assets as defined in IAS 19. For this reason, MTU München Unterstützungskasse GmbH, Munich, is not consolidated.

## Change in composition of group reporting entity

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, 2014** | **11** | **18** | **29** |
| Acquisitions 2015 | | 2 | 2 |
| Disposals 2015 | | | |
| **Shareholdings at Dec. 31, 2015** | **11** | **20** | **31** |
| Acquisitions 2016 | | 1 | 1 |
| Disposals 2016 | | –1 | –1 |
| **Shareholdings at Dec. 31, 2016** | **11** | **20** | **31** |

On July 12, 2016, MTU Aero Engines AG, Munich acquired an 18% shareholding in PW 1100G-JM Engine Leasing LLC., East Hartford, USA. The purpose of this company is to lease replacement engines for the PW 1100G program. The equity investment is accounted for using the equity method and included in the consolidated financial statements from the date of acquisition.

The 19.3% share in Middle East Propulsion Company Ltd., Riyadh, Saudi Arabia was sold with effect of December 21, 2016. The disinvestment generated net proceeds of € 4.1 million.

## 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 power over the investee. There were no changes in the classification of these controlling interests during the reporting period. Associated companies

## Associated companies

Associated companies are companies in which MTU has significant powers of control 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. IAE International Aero Engines LLC., East Hartford, USA, was identified as an associated company for the first time in 2016 and was included in the consolidated financial statements using the equity method. Up until 2015, the shares in this equity holding were accounted for at cost. There were no changes in the classification of other equity investments during the reporting period. Whereas MTU's share in the voting rights of IAE International Aero Engines LLC., East Hartford, USA, and PW1100G-JM Engine Leasing LLC., East Hartford, USA, does not exceed 18 %, the agreements concluded with these companies give MTU significant influence over management decisions, 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, and
- AES Aerospace Embedded Solutions GmbH, Munich, Germany

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 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 and concessions, 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 purchased ("externally acquired") development assets and self-created ("internally generated") development assets. Services provided as part of externally funded development projects are allocated to cost of sales.

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 they become 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 by means of a valuation 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 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 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 depreciation of machines used in multi-shift operation is accelerated by using a higher shift coefficient 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 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 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 the 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 (group of) cash-generating units to which the asset ultimately belongs. That involves making forecasts of the cash flow that can be generated by the asset or group of cash-generating units, and applying a discount rate that takes into account the risks associated with the asset or group of cash-generating units.

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 concessions 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 therefore 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 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 held. No financial assets were reclassified in the financial year 2016.

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. 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 where appropriate).

## 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. 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 allowed to be 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 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 net loan proceeds. 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 below 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, interest rate 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 tax assets and liabilities are recognized in the consolidated financial statements in the manner prescribed in the relevant tax jurisdictions. Current and deferred tax assets and liabilities 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 field audits is recognized 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 that are permitted to be carried forward for tax purposes and tax refunds. 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

Pension provisions 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 on the basis of their settlement amount, discounted to the reporting date. 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 the IFRS 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 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 effected and, where applicable, on subsequent periods.

- Due to the prolonged product lifecycle, changes in the applied interest rates and payment flows have a significant impact on the measurement of engine programs.
- 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, is not sufficiently detailed to assess the consequences of individual events, 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. Payables 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 debts 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, as in 2015, 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 in progressive stages as the work advances, using the percent-age-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.
- The cost of sales for engine components and spare parts in the month of December is partially based on estimates for bookkeeping purposes. These estimations are derived principally from preliminary data supplied by the consortium leaders and from material flow data. 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 discount rate is an important factor when determining the provisions to be allocated for pensions and similar obligations. The total value of pension obligations and therefore the expenses in connection with employees' retirement benefits are determined using actuarial

methods based on assumptions concerning interest rates, the implementation 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 on the part of MTU. Similarly, when accounting for 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 amounts of the provisions.

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.

# II. Notes to the consolidated income statement

## 1. Revenues

Revenues developed in the reporting period as follows:

Revenues

| in € million | 2016 | 2015 |
|---|---|---|
| **Commercial engine business** | | |
| Manufacturing | 2,261.5 | 2,326.7 |
| Other products | 139.7 | 87.3 |
| **Total commercial engine business** | **2,401.2** | **2,414.0** |
| **Military engine business** | | |
| Manufacturing | 298.8 | 298.2 |
| Other products | 205.2 | 184.9 |
| **Total military engine business** | **504.0** | **483.1** |
| **Total commercial and military engine business (OEM)** | **2,905.2** | **2,897.1** |
| **Commercial maintenance business (MRO)** | **1,914.4** | **1,580.6** |
| Consolidation | –86.9 | –42.4 |
| **Total revenues** | **4,732.7** | **4,435.3** |

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 | 2016 | 2015 |
|---|---|---|
| Cost of materials | –3,351.5 | –3,183.1 |
| Personnel expenses | –479.5 | –480.6 |
| Depreciation and amortization | –171.9 | –162.5 |
| Other cost of sales | –71.9 | –28.8 |
| **Total cost of sales** | **–4,074.8** | **–3,855.0** |

The change in cost of sales is consistent with the growth in revenues in the reporting period and continues to reflect the production ramp-up in connection with MTU’s share in new engine programs.

The item “Other cost of sales” includes an amount of € 25.7 million recognized in respect of the increase in inventories for work in progress and finished products (2015: € 76.0 million), and the effect of translation differences on trade payables, which amounted to a loss of € 36.8 million (2015: a loss of € 43.3 million).

## 3. Research and development expenses

Company-funded research and development expenditure developed as follows:

Research and development expenses

| in € million | 2016 | 2015 |
|---|---|---|
| Cost of materials | –93.4 | –106.6 |
| Personnel expenses | –72.3 | –60.6 |
| Depreciation and amortization | –2.3 | –1.5 |
| **Company-funded research and development expenditure** | **–168.0** | **–168.7** |
| of which the following amounts were capitalized: | | |
| Development costs (OEM) | 96.2 | 102.2 |
| Development costs (MRO) | 0.7 | |
| **Capitalized development costs** | **96.9** | **102.2** |
| **Research and development costs recognized as expense** | **–71.1** | **–66.5** |

For more information, please refer to the “Research and development” section of the combined management report.

## 4. Selling expenses

Selling expenses

| in € million | 2016 | 2015 |
|---|---|---|
| Cost of materials | –18.6 | –16.9 |
| Personnel expenses | –63.3 | –64.3 |
| Depreciation and amortization | –1.4 | –1.5 |
| Other selling expenses | –20.7 | –11.6 |
| **Total selling expenses** | **–104.0** | **–94.3** |

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 | 2016 | 2015 |
|---|---|---|
| Cost of materials | –6.9 | –6.6 |
| Personnel expenses | –55.4 | –51.6 |
| Depreciation and amortization | –1.9 | –2.1 |
| Other administrative expenses | –6.6 | –5.3 |
| **Total general administrative expenses** | **–70.8** | **–65.6** |

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 | 2016 | 2015 |
|---|---|---|
| **Income** | | |
| Gains from the disposal of intangible assets and property, plant and equipment | 0.1 | 0.4 |
| Reimbursement of insurance claims | 2.6 | 3.2 |
| Rental income from | | |
| property owned by MTU | 2.2 | 2.5 |
| sublet property owned by third parties | 1.5 | 0.8 |
| Sundry other operating income | 10.8 | 7.7 |
| **Total other operating income** | **17.2** | **14.6** |
| **Expenses** | | |
| Losses from the disposal of intangible assets and property, plant and equipment | –0.4 | –0.3 |
| Rental payments for sublet property | –1.5 | –0.8 |
| Expenses associated with insurance claims | –2.9 | –3.3 |
| Sundry other operating expenses | –2.3 | –9.2 |
| **Total other operating expenses** | **–7.1** | **–13.6** |
| **Balance of other operating income and expenses** | **10.1** | **1.0** |

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.

A significant item recognized under sundry other operating income in 2016 is the net proceeds amounting to € 4.1 million from the sale of MTU’s 19.3% shareholding in Middle East Propulsion Company Ltd., Riyadh, Saudi Arabia.

## 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 | 2016 | 2015 |
|---|---|---|
| **Profit / loss of companies accounted for using the equity method** | | |
| Associates | 0.8 | 0.4 |
| Joint Ventures | 27.8 | 28.7 |
| **Total profit / loss of companies accounted for using the equity method** | **28.6** | **29.1** |
| **Profit / loss of companies accounted for at cost** | | |
| Military program coordination and management companies | 1.1 | 0.5 |
| Other related companies | 1.0 | 1.1 |
| **Total profit / loss of companies accounted for at cost** | **2.1** | **1.6** |

As in 2015, the development of business by the joint venture MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China, was responsible for a significant part of MTU's share of the profit/loss of companies accounted for using the equity method.

## 8. Interest result

Interest result

| in € million | 2016 | 2015 |
|---|---|---|
| **Interest income** | **0.8** | **2.4** |
| Interest expense on | | |
| Corporate bonds and notes | –11.5 | –11.5 |
| Convertible bond | –2.9 | |
| Liabilities to banks | –0.9 | –0.9 |
| Finance lease arrangements | –0.4 | –0.4 |
| Other interest expenses | –2.8 | –1.2 |
| Capitalized borrowing costs for qualifying assets | 5.8 | 10.5 |
| **Interest expenses** | **–12.7** | **–3.5** |
| **Interest result** | **–11.9** | **–1.1** |
| Thereof: on financial instruments classified in accordance with IAS 39 as: | | |
| Loans and receivables | 2.6 | 2.1 |
| Available-for-sale financial assets | 2.2 | 1.9 |
| Financial liabilities measured at amortized cost | –12.8 | –3.5 |

In the financial year 2016, borrowing costs in the amount of € 5.8 million (2015: € 10.5 million), were capitalized for qualifying assets acquired or constructed mainly in connection with the group's stake in the GE9X, PW1700G/PW1900G and PW800 engine programs. The capitalized amount was determined on the basis of a cost of debt capital of 2.44 % (2015: 3.18 %).

# 9. Financial result on other items

Financial result on other items

| in € million | 2016 | 2015 |
|---|---|---|
| Effects from currency translation: exchange rate gains / losses on | | |
| Currency holdings | –3.4 | 7.8 |
| Financing transactions | 0.1 | –8.9 |
| Fair value gains / losses on derivatives | | |
| Currency and interest rate derivatives | 7.8 | –33.7 |
| Forward commodity sales contracts | –0.3 | –0.9 |
| Interest portion included in measurement of assets and liabilities | | |
| relating to pension funds | –16.3 | –13.3 |
| Receivables, other provisions and liabilities | –13.1 | –16.7 |
| Financial result on sundry other items | –0.1 | 2.0 |
| **Financial result on other items** | **–25.3** | **–63.7** |
| Thereof: on financial instruments classified in accordance with IAS 39 as: | | |
| Financial assets at fair value through profit or loss - held for trading | 39.4 | 41.5 |
| Financial liabilities at fair value through profit or loss - held for trading | –31.9 | –74.1 |

The € 38.4 million improvement of the financial result on other items down to a net expense of € 25.3 million (2015: net expense of € 63.7 million) was largely due to the fact that the euro fell less against the U.S. dollar during the reporting period than in the financial year 2015. This led to fair-value gains on derivatives amounting to € 7.5 million (2015: fair-value losses on derivatives of € 34.6 million).

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 field audits.

Analysis of current and deferred tax expenses

| in € million | 2016 | 2015 |
|---|---|---|
| Tax expense incurred in current period | –104.9 | –115.7 |
| Tax expense incurred in prior periods | 3.5 | –21.4 |
| **Current tax expense** | **–101.4** | **–137.1** |
| Deferred tax income resulting from temporary differences | –10.2 | 39.6 |
| Deferred tax income resulting from tax credits | 2.7 | –4.2 |
| Deferred tax income resulting from tax losses carried forward | 5.9 | –1.5 |
| **Deferred tax income** | **–1.6** | **33.9** |
| **Recognized tax expense** | **–103.0** | **–103.2** |

The tax expense incurred in prior periods includes interest income amounting to € 0.1 million (2015: interest expenses of € 8.6 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 2016, 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 37%.

Information on changes in deferred tax assets and liabilities is provided in Note 33 (Deferred tax assets and liabilities).

Reconciliation of expected tax expense to recognized tax expense:

Tax reconciliation

| in € million | 2016 | 2015 |
|---|---|---|
| Earnings before tax | 415.6 | 320.8 |
| Income tax rate (including municipal trade tax) | 32,2 % | 32,2 % |
| **Total other operating income** | **–133.8** | **–103.3** |
| Impact of | | |
| Recognition and measurement adjustments and write-downs on deferred tax assets | 8.1 | –2.6 |
| Non-tax-deductible expenses and tax exempt income | –2.1 | –1.4 |
| Lower tax rate for companies outside Germany | 1.6 | –6.0 |
| Investments accounted for using the equity method | 8.9 | 9.1 |
| Tax field audit | 9.0 | 1.7 |
| Tax credits available for carry-forward | 4.8 | –2.4 |
| Source tax on dividend paid by MTU Maintenance Zhuhai | –1.6 | –1.3 |
| Change in overall tax rate on corporate income | | 2.1 |
| Other impacts | 2.1 | 0.9 |
| **Recognized tax expense** | **–103.0** | **–103.2** |
| **Effective tax rate** | **24.8%** | **32.2%** |

## 11. Earnings per share

Diluted earnings per share are calculated by dividing earnings after tax 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 2016, the group generated earnings after tax amounting to € 312.2 million (2015: € 217.6 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 51,262,220 (2015: 51,073,326 shares). Based on these parameters, basic earnings per share amounted to € 6.09 in 2016 (2015: € 4.26).

Diluting effects arose from 2,671,580 shares that could potentially be issued through the convertible bond issued in May 2016, and from 791 shares that could potentially be issued through the Share Matching Plan (SMP), so that diluted earnings per share amounted to € 5.83 (2015: € 4.26).

## 12. Additional disclosures relating to the income statement

After adjustments to eliminate the effect of purchase price allocation in connection with the acquisition of the group companies, and of non-recurring items, and after addition of depreciation and amortization, the following intermediate results are obtained:

Reconciliation of EBIT to adjusted EBIT, depreciation / amortization expense and non-recurring items

| in € million | 2016 | 2015 |
|---|---|---|
| **Earnings before interest and tax (EBIT)** | **452.8** | **385.6** |
| + Depreciation / amortization effect of purchase price allocation / V2500 stake increase | | |
| Intangible assets | 49.9 | 54.2 |
| Property, plant and equipment | 0.3 | 0.5 |
| **Total depreciation / amortization expense** | **50.2** | **54.7** |
| **Adjusted earnings before interest and tax (adjusted EBIT)** | **503.0** | **440.3** |

Costs by function include the following personnel expenses items:

Personnel expenses

| in € million | 2016 | 2015 |
|---|---|---|
| Wages and salaries | 561.4 | 546.0 |
| Social security, pension and other benefit expenses | 102.6 | 104.8 |
| **Total personnel expenses** | **664.0** | **650.8** |

Pension benefits account for € 15.9 million (2015: € 20.4 million) of these expenses. Other social security expenses amounted to € 86.7 million (2015: € 84.4 million).

The average number of persons employed during the financial year 2016 breaks down as follows:

Disclosures relating to the average number of employees

| in € million | 2016 | 2015 |
|---|---|---|
| Industrial staff | 3,626 | 3,633 |
| Administrative staff | 3,730 | 3,660 |
| Employees on temporary contracts | 456 | 487 |
| Trainees | 308 | 336 |
| Students on work experience projects | 232 | 232 |
| **Total average number of employees** | **8,352** | **8,348** |

Costs by function include the following cost-of-materials items:

Cost of materials

| in € million | 2016 | 2015 |
|---|---|---|
| Cost of raw materials and supplies | 1,394.3 | 1,222.5 |
| Cost of purchased services | 1,978.6 | 2,017.3 |
| **Total cost of materials** | **3,372.9** | **3,239.8** |

The fees charged by the accounting firm Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft for the auditing of the consolidated financial statements for the financial year 2016 in accordance with Section 314 (1) no. 9 of the German Commercial Code (HGB), and other independent auditing services, amounted to a total of € 0.8 million (2015: € 1.2 million).

Fees paid to the auditor

| in € million | 2016 | 2015 |
|---|---|---|
| Financial statement auditing services | 0.7 | 1.1 |
| Other independent auditing services | | 0.1 |
| Other independent services | 0.1 | |
| **Total fees paid to the auditor** | **0.8** | **1.2** |

# III. Notes to the consolidated balance sheet

## 13. Analysis of changes in intangible assets and property, plant and equipment 2016

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 costs | 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 costs | 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** |

# Analysis of changes in intangible assets and property, plant and equipment 2015

Changes in non-financial assets - cost of acquisition and construction 2015

| in € million | Balance at Jan. 1, 2015 | Translation differences | Additions | Transfers | Disposals | **Balance at Dec. 31, 2015** |
|---|---|---|---|---|---|---|
| Program assets | 1,762.2 | 1.6 | 50.8 | 39.2 | –4.7 | 1,849.1 |
| Program-independent technologies | 124.7 | | | | | 124.7 |
| Customer relations | 56.5 | | | | | 56.5 |
| Rights and licenses | 107.0 | 1.0 | 20.3 | 0.5 | –0.1 | 128.7 |
| Goodwill | 391.5 | 0.6 | | | | 392.1 |
| Prepayments on intangible assets | 38.5 | | | –38.5 | | |
| Development costs | 309.4 | | 108.7 | 4.5 | | 422.6 |
| **Intangible assets** | **2,789.8** | **3.2** | **179.8** | **5.7** | **–4.8** | **2,973.7** |
| Land, leasehold rights and buildings, including buildings on non-owned land | 418.4 | –0.7 | 2.6 | 14.3 | –1.0 | 433.6 |
| Technical equipment, plant and machinery | 498.0 | –1.1 | 18.0 | 19.9 | –10.5 | 524.3 |
| Other equipment, operational and office equipment | 410.2 | 0.2 | 60.8 | –0.4 | –18.4 | 452.4 |
| Advance payments and construction in progress | 49.4 | 0.1 | 48.5 | –39.5 | | 58.5 |
| **Property, plant and equipment** | **1,376.0** | **–1.5** | **129.9** | **–5.7** | **–29.9** | **1,468.8** |
| **Total** | **4,165.8** | **1.7** | **309.7** | | **–34.7** | **4,442.5** |

Changes in non-financial assets - depreciation / amortization and carrying amount 2015

| in € million | Balance at Jan. 1, 2015 | Translation differences | Depreciation / amortization | Transfers | Disposals | **Balance at Dec. 31, 2015** | **Carrying amount Dec. 31, 2015** |
|---|---|---|---|---|---|---|---|
| Program assets | 440.1 | –0.5 | 56.6 | | | 496.2 | 1,352.9 |
| Program-independent technologies | 124.7 | | | | | 124.7 | |
| Customer relations | 36.2 | | 2.5 | | | 38.7 | 17.8 |
| Rights and licenses | 81.0 | 1.0 | 8.4 | | –0.1 | 90.3 | 38.4 |
| Goodwill | | | | | | | 392.1 |
| Prepayments on intangible assets | | | | | | | |
| Development costs | 7.0 | | 2.3 | 0.5 | | 9.8 | 412.8 |
| **Intangible assets** | **689.0** | **0.5** | **69.8** | **0.5** | **–0.1** | **759.7** | **2,214.0** |
| Land, leasehold rights and buildings, including buildings on non-owned land | 112.8 | –0.3 | 13.1 | | –0.1 | 125.5 | 308.1 |
| Technical equipment, plant and machinery | 384.3 | –0.7 | 35.0 | –0.9 | –9.7 | 408.0 | 116.3 |
| Other equipment, operational and office equipment | 268.6 | 0.1 | 49.7 | 0.6 | –15.7 | 303.3 | 149.1 |
| Advance payments and construction in progress | 0.2 | | | –0.2 | | | 58.5 |
| **Property, plant and equipment** | **765.9** | **–0.9** | **97.8** | **–0.5** | **–25.5** | **836.8** | **632.0** |
| **Total** | **1,454.9** | **–0.4** | **167.6** | | **–25.6** | **1,596.5** | **2,846.0** |

## 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 2016, capitalized intangible assets totaling € 115.4 million (2015: € 179.8 million) were recognized, of which € 52.9 million (2015: € 131.5 million) were externally acquired and € 62.5 million (2015: € 48.3 million) were internally generated. New engine programs accounted for € 112.8 million (2015: € 159.5 million) of this amount, while € 90.0 million (2015: € 98.0 million) derived from the partnership with Pratt & Whitney and € 22.8 million (2015: € 61.5 million) from that with GE.

Additions to program assets in the financial year 2016 include an amount of € 5.6 million (2015: disposals of € 4.7 million) arising from the amortization of the IAE V2500 stake increase as a result of the settlement and sub-sequent 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 € 75.2 million (2015: € 68.7 million), research and development expenses € 0.3 million (2015: € 0.3 million), selling expenses € 0.3 million (2015: € 0.4 million), and general administrative expenses € 0.3 million (2015: € 0.4 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.

## 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 2016, the group's total capital expenditure on property, plant and equipment amounted to € 159.4 million (2015: € 129.9 million). The depreciation expense on property, plant and equipment is included in the presentation of the following line items: cost of sales € 96.7 million (2015: € 93.8 million), research and development expenses € 2.0 million (2015: € 1.2 million), selling expenses € 1.1 million (2015: € 1.1 million), and general administrative expenses € 1.6 million (2015: € 1.7 million).

Additions to land, leasehold rights and buildings, including buildings on non-owned land, in the financial year 2016 amounted to € 3.7 million (2015: € 2.6 million) and relate mainly to the creation of additional on-site logistics capacity for the ramp-up of the geared turbofan programs at the MTU Aero Engines AG location in Munich.

Capital expenditure on technical equipment, plant and machinery totaling € 20.3 million (2015: € 18.0 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 primarily relates to the acquisition or construction costs of production resources and tools for programs in the ramp-up phase, of certification and lease engines, and of data processing systems.

Additions to advance payments and construction in progress in the financial year 2016 amounted to € 51.1 million (2015: € 48.5 million) and relate mainly to the purchase of technical equipment, plant and machinery and of operational and office equipment for the Munich and Hannover sites.

Capitalized assets under finance lease agreements are based on the following components:

Lease payments under finance lease agreements

| in € million | 2016 | 2015 |
|---|---|---|
| **Lease payments** | | |
| Due in less than one year | 1.7 | 1.7 |
| Due in more than one year and less than five years | 5.7 | 6.6 |
| Due in more than five years | 4.2 | 5.0 |
| **Total future minimum lease payments** | **11.6** | **13.3** |
| **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 | 0.4 | 0.6 |
| Due in more than five years | 1.7 | 1.7 |
| **Total interest portion of future minimum lease payments** | **2.3** | **2.5** |
| **Present value of lease payments** | | |
| Due in less than one year | 1.5 | 1.5 |
| Due in more than one year and less than five years | 5.3 | 6.0 |
| Due in more than five years | 2.5 | 3.3 |
| **Total present value of future minimum lease payments** | **9.3** | **10.8** |

A net carrying amount of € 9.5 million (2015: € 11.8 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 € 5.8 million (2015: € 5.9 million) was capitalized at December 31, 2016.

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 an additional 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, to take advantage of the attractive financing conditions at that time, 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, 2016, the carrying amount of assets financed in this way amounted to € 3.6 million (2015: € 5.8 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 € 201.9 million at the reporting date (2015: € 168.0 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 in 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 | 2016 | | | 2015 | |
|---|---|---|---|---|---|
| | 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. |
| **Balance Sheet at December 31** | | | | | |
| Current assets | 2,472.8 | 1,013.0 | 61.5 | 2,681.0 | 113.3 |
| Non-current assets | 338.4 | 3.8 | 160.3 | 287.4 | |
| Current liabilities | 1,315.1 | 1,013.6 | 71.2 | 1,818.5 | 112.5 |
| Non-current liabilities | 1,413.1 | | | 1,072.2 | |
| Equity | 83.0 | 3.2 | 150.6 | 77.7 | 0.8 |
| Proportional share of equity | 21.0 | 0.5 | 27.1 | 19.6 | 0.1 |
| Reconciliation | 4.6 | | –0.4 | 5.3 | –0.1 |
| Carrying amount of companies accounted for using the equity method | 25.6 | 0.5 | 26.7 | 24.9 | |
| **Income Statement** | | | | | |
| Revenues | 3,170.7 | 175.0 | 5.2 | 3,100.6 | 10.5 |
| Earnings after tax | 4.2 | 2.2 | 2.6 | 3.7 | 0.8 |
| Other comprehensive income | | | | | |
| Total comprehensive income | 4.2 | 2.2 | 2.6 | 3.7 | 0.8 |

## 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 % |

All companies listed in the above table are accounted for using the equity method in the 2016 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 MRO services for P&WC engines to customers in Europe, Africa and the Middle East.

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 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 |
| **Earnings after tax** | **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 non-audited comparative data for 2015 are as follows:

Income statements, statements of comprehensive income and balance sheets of the principal joint ventures 2015

| 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 | 185.1 | 6.7 | 16.3 | 24.8 | 640.3 |
| Depreciation / amortization and valuation allowances | | –0.4 | –0.7 | –1.7 | –5.2 |
| Interest income | | | | | 0.2 |
| Interest expenses | | | –0.1 | –0.1 | –2.0 |
| Income tax credits | 0.9 | | 0.1 | | |
| Income tax expense | –0.4 | –0.3 | | –0.2 | –4.6 |
| Other income and expenses | –180.4 | –5.3 | –16.2 | –16.1 | –577.7 |
| **Earnings after tax** | **5.2** | **0.7** | **–0.6** | **6.7** | **51.0** |
| Other comprehensive income | | | –0.2 | 4.0 | |
| **Total comprehensive income** | **5.2** | **0.7** | **–0.8** | **10.7** | **51.0** |
| **Balance sheet disclosures** | | | | | |
| Non-current assets | 2.0 | 3.8 | 1.8 | 16.8 | 87.0 |
| Cash and cash equivalents | 49.4 | 1.4 | 7.3 | 7.4 | 28.1 |
| Other current assets | 46.2 | 2.1 | 2.2 | 6.8 | 386.7 |
| **Total assets** | **97.6** | **7.3** | **11.3** | **31.0** | **501.8** |
| Equity | 11.8 | 5.5 | 2.8 | 24.2 | 244.9 |
| Non-current financial liabilities | | | 3.5 | | 42.6 |
| Other non-current liabilities | | | | 1.2 | |
| Current financial liabilities | 31.8 | 1.1 | 3.8 | 5.6 | 179.4 |
| Other current liabilities | 54.0 | 0.7 | 1.2 | | 34.9 |
| **Total equity and liabilities** | **97.6** | **7.3** | **11.3** | **31.0** | **501.8** |
| **Reconciliation of carrying amount** | | | | | |
| Proportional share of equity | 5.9 | 2.7 | 1.4 | 12.1 | 122.4 |
| Reconciliation of carrying amount | | | –1.4 | | |
| **Carrying amount of companies accounted for using the equity method** | **5.9** | **2.7** | | **12.1** | **122.4** |
| **Dividend received from the joint ventures** | | **0.4** | | **0.4** | **13.3** |

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, 2016 | Dec. 31, 2015 | Dec. 31, 2016 | Dec. 31, 2015 | Dec. 31, 2016 | Dec. 31, 2015 |
| **Loans and receivables (LaR) and sundry other financial assets** | **144.3** | **95.1** | **126.4** | **78.5** | **17.9** | **16.6** |
| Loans to third parties[1] | 98.6 | 60.7 | 98.6 | 60.7 | | |
| Loans to related companies[1] | 23.9 | 13.8 | 23.9 | 13.1 | | 0.7 |
| Receivables from employees | 1.1 | 0.9 | | | 1.1 | 0.9 |
| Receivables from suppliers | 1.7 | 2.3 | | | 1.7 | 2.3 |
| Sundry other financial assets | 19.0 | 17.4 | 3.9 | 4.7 | 15.1 | 12.7 |
| **Available-for-sale financial assets (AfS)** | **28.4** | **44.0** | **3.4** | **6.1** | **25.0** | **37.9** |
| Other interests in related entities | 3.4 | 6.1 | 3.4 | 6.1 | | |
| Securities[1] | 25.0 | 37.9 | | | 25.0 | 37.9 |
| **Derivatives without hedging relationship (FAHfT)** | | **0.2** | | **0.1** | | **0.1** |
| **Derivatives with hedging relationship (n.a.)** | **0.4** | **0.7** | **0.4** | **0.5** | | **0.2** |
| **Total other financial assets** | **173.1** | **140.0** | **130.2** | **85.2** | **42.9** | **54.8** |

[1] Included in net financial debt

The additions to loans to third parties relate primarily to loans to aircraft manufacturers for the purpose of financing development activities and aircraft for use as sales promotion instruments, in both cases in connection with MTU's partnership in commercial engine programs. The additions to loans to related companies concern Sumisho Aero Engines Lease B.V., Amsterdam, Netherlands, and relate to the engine leasing business for commercial aircraft.

The receivables from suppliers primarily include short-term credit notes which were received for returned goods, amendments to invoices, and trade discounts and concessions.

Sundry other financial assets amounting to € 19.0 million (2015: € 17.4 million) relate mainly to outstanding credit notes for trade discounts and 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. Securities refer to investments for the purpose of liquidity management with an original maturity of more than three months.

At the reporting date, derivative financial assets comprised the following instruments:

Derivative financial instruments

| | Total | | Non-current | | Current | |
|---|---|---|---|---|---|---|
| in € million | Dec. 31, 2016 | Dec. 31, 2015 | Dec. 31, 2016 | Dec. 31, 2015 | Dec. 31, 2016 | Dec. 31, 2015 |
| Forward foreign exchange contracts | 0.4 | 0.7 | 0.4 | 0.5 | | 0.2 |
| Currency options / swaps | | 0.2 | | 0.1 | | 0.1 |
| **Total derivative financial instruments** | **0.4** | **0.9** | **0.4** | **0.6** | | **0.3** |

# 17. Inventories

The carrying amount of inventories, after write-downs, comprises the following components:

Inventories

| in € million | Change in valuation allowance | Dec. 31, 2016 gross | Dec. 31, 2016 Valuation allowance | Dec. 31, 2016 Carrying amount | Dec. 31, 2015 gross | Dec. 31, 2015 Valuation allowance | Dec. 31, 2015 Carrying amount |
|---|---|---|---|---|---|---|---|
| Raw materials and supplies | 3.9 | 437.5 | –30.2 | 407.3 | 355.3 | –34.1 | 321.2 |
| Work in progress | 4.1 | 247.8 | –6.2 | 241.6 | 256.7 | –10.3 | 246.4 |
| Finished goods | 5.1 | 375.6 | –23.1 | 352.5 | 339.8 | –28.2 | 311.6 |
| Advance payments | | 21.3 | | 21.3 | 14.8 | | 14.8 |
| **Total inventories** | **13.1** | **1,082.2** | **–59.5** | **1,022.7** | **966.6** | **–72.6** | **894.0** |

Out of the total volume of inventories, an amount valued at € 218.5 million (2015: € 266. million) was considered to be impaired at the reporting date.

# 18. Trade receivables

Trade receivables

| in € million | Dec. 31, 2016 | Dec. 31, 2015 |
|---|---|---|
| Third parties | 574.9 | 640.9 |
| Related companies | 117.2 | 67.6 |
| **Total trade receivables** | **692.1** | **708.5** |

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 | 2016 | 2015 |
|---|---|---|
| **Allowances at January 1** | **7.1** | **6.9** |
| Translation differences | 0.1 | |
| Additions (expense for specific allowances) | 8.5 | 2.3 |
| Utilized | –1.0 | –0.9 |
| Reversed | | –1.2 |
| **Allowances at December 31** | **14.7** | **7.1** |

The additions to this item in 2016 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 bad debts on trade receivables written off as uncollectable offset against income from bad debts recovered amounted to € 0.3 million (2015: a net expense of € 1.3 million).

As in prior years, all expense and income amounts arising from valuation allowances and the write-off of uncollectable bad debts on 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, 2016 | Dec. 31, 2015 |
|---|---|---|
| **Neither impaired nor past due at the reporting date** | **1,085.5** | **1,177.7** |
| **Not impaired and due in the following time windows** | **206.6** | **95.3** |
| Less than 90 days | 80.9 | 40.4 |
| Between 90 and 180 days | 51.7 | 15.7 |
| Between 181 and 360 days | 55.3 | 23.1 |
| More than 360 days | 18.7 | 16.1 |
| **Impaired** | **14.7** | **7.1** |
| **Total receivables before deduction of valuation allowances** | **1,306.8** | **1,280.1** |
| Valuation allowances | –14.7 | –7.1 |
| **Total receivables** | **1,292.1** | **1,273.0** |

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 contracts and service business receivables

Construction contracts and service business receivables

| in € million | Dec. 31, 2016 | Dec. 31, 2015 |
|---|---|---|
| Construction contract receivables (based on percentage of completion) | 360.2 | 383.7 |
| Thereof: Advance payments received for construction contracts | –206.8 | –263.2 |
| Service business receivables (based on percentage of completion) | 239.8 | 180.8 |
| **Total construction contract and service business receivables** | **393.2** | **301.3** |

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 reflects the percentage of completion of contracts in the commercial MRO service business for which settlement will be received at a later date and the manufacturing portion of contracts in the military engine business, where the amount of receivables is partially covered by advance payments. 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, 2016 | Dec. 31, 2015 |
|---|---|---|
| Incurred construction costs incl. recognized income and losses | 737.2 | 654.7 |
| Partial settlements | –377.0 | –271.0 |
| **Total construction contract receivables** | **360.2** | **383.7** |

In the financial year 2016, revenues arising from construction contracts amounting to € 213.5 million (2015: € 192.3 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.

## 20. Other assets

Other assets include claims for tax refunds and prepaid maintenance charges, insurance premiums and rents.

## 21. Cash and cash equivalents

The cash and cash equivalents amounting to € 322.4 million (2015: € 53.1 million) comprise cash in hand and bank deposits. This item also includes foreign currency holdings amounting to the equivalent of € 81.0 million (2015: € 52.2 million).

## 22. Income tax claims

At the reporting date, recognized recoverable income taxes (income tax claims) amounted to € 21.1 million (2015: € 0.0 million).

## 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 as guarantor for the bonds. In the reporting period, 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 reporting period. A more detailed description of the Restricted Stock Plan is provided in the management compensation report for 2016 and in the Notes to the consolidated financial statements in the Annual Report 2015.

Capital reserves additionally include the difference between the fair value and the carrying amount of the treasury shares issued under the terms of the Restricted Stock Plan or sold under the MAP employee stock option program.

## 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 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 2015, MTU did not purchase any treasury shares in the financial year 2016.

**Reconciliation of weighted average number of outstanding shares**
In the financial year 2016, the weighted average number of outstanding shares totaled 51,262,220 (2015: 51,073,326). At December 31, 2016, the number of outstanding shares of MTU Aero Engines AG, Munich totaled 51,356,103 (2015: 51,118,724). The number of treasury shares at December 31, 2016 amounted to 643,897 (December 31, 2015: 881,276).

**Issue of shares**
Based on the new compensation system in effect as from the financial year 2016, 24,804 treasury shares were sold to the eligible senior managers, and 35,489 to the Executive Board.

A total of 147,094 shares (2015: 90,237 shares) were sold to group employees in the financial year 2016 under the MAP employee stock option program, and 29,992 treasury shares (2015: 16,099 shares) were sold to eligible senior managers.

## Other comprehensive income

In the financial year 2016, other comprehensive income was reduced by € 61.4 million to a negative balance of € 332.8 million (2015: a negative balance of € 271.4 million), principally as a result of translation differences arising from the financial statements of international entities, actuarial gains and losses on plan assets and pension obligations, and changes in the fair value of cash flow 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 | 2016 before | 2016 Income taxes | 2016 after | 2015 before | 2015 Income taxes | 2015 after |
|---|---|---|---|---|---|---|
| Exchange differences arising from the translation of financial statements of foreign operations accounted for using the equity method | –2.2 | | –2.2 | 10.2 | | 10.2 |
| Exchange differences arising from the translation of financial statements of other foreign operations | –3.3 | | –3.3 | 2.5 | | 2.5 |
| **Exchange differences arising from the translation of financial statements of foreign operations** | **–5.5** | | **–5.5** | **12.7** | | **12.7** |
| Actuarial gains and losses on plan assets and pension obligations | –79.9 | 25.6 | –54.3 | –14.0 | 3.5 | –10.5 |
| Financial instruments designated as cash flow hedges | 1.2 | –2.8 | –1.6 | –54.7 | 11.9 | –42.8 |
| **Income and expense recognized in other comprehensive income** | **–84.2** | **22.8** | **–61.4** | **–56.0** | **15.4** | **–40.6** |

## 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 earnings after tax 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 and on optimizing the equity ratio. 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 € 1.3 million in 2016 (2015: € 1.1 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 2016 totaled € 39.1 million (2015: € 38.0 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, 2016 | Dec. 31, 2015 |
|---|---|---|
| Present value of provision-financed pension obligations | 883.0 | 801.9 |
| Fair value of plan assets | –0.2 | –0.2 |
| **Total Germany** | **882.8** | **801.7** |
| Present value of fund-financed pension obligations | 28.2 | 24.2 |
| Fair value of plan assets | –27.7 | –25.1 |
| **Total foreign countries (negative value = plan assets surplus)** | **0.5** | **–0.9** |
| **Recognized pension obligations** | **883.3** | **800.8** |

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, 2016 | Dec. 31, 2015 |
|---|---|---|
| Interest rate for accounting purposes | 1.35 | 2.05 |
| Salary trend | 2.70 | 2.70 |
| Pension trend | 1.75 | 1.75 |

Actuarial assumptions: other countries

| in % | Dec. 31, 2016 | Dec. 31, 2015 |
|---|---|---|
| Interest rate for accounting purposes | 3.25 | 4.00 |
| 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 decreased compared with 2015. In view of the duration of the obligations, which currently stands at 12 years, pension obligations were discounted at December 31, 2016, using a discount rate of 1.35%. The biometric tables issued by Prof. Dr. Heubeck (RT 2005 G) 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 2016:

Change in present value of pension obligations

| in € million | 2016 | 2015 |
|---|---|---|
| **Defined benefit obligation at January 1** | **826.1** | **810.9** |
| Current service cost | 17.1 | 17.1 |
| Past service cost | | 0.7 |
| Contributions for pension plan subscribers | 8.9 | 6.7 |
| Interest cost | 16.8 | 14.1 |
| Translation differences / transfers | 1.6 | –1.8 |
| Actuarial gains (-) / losses (+) | | |
| Financial assumptions | 78.0 | –34.4 |
| Assumptions based on experience | 2.0 | 49.4 |
| Plan settlements / transfers | –13.7 | –10.4 |
| Pension benefit and capital payments | –25.6 | –26.2 |
| **Defined benefit obligation at December 31** | **911.2** | **826.1** |

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 deconsolidation of group companies and the conversion of pension benefits into fixed-sum payments.

The fair value of plan assets changed as follows in the financial year 2016:

Fair value of plan assets

| in € million | 2016 | 2015 |
|---|---|---|
| **Fair value of plan assets at January 1** | **25.3** | **27.3** |
| Interest income on plan assets | 1.0 | 1.0 |
| Actuarial gains / losses | 0.4 | 0.7 |
| Translation differences / transfers | 1.7 | –1.8 |
| Employer contributions | 0.9 | 1.1 |
| Employee contributions to plan | 0.1 | 0.1 |
| Pension benefit payments | –1.5 | –3.1 |
| **Fair value of plan assets at December 31** | **27.9** | **25.3** |

Composition of plan assets

| in % | 2016 | 2015 |
|---|---|---|
| Share investments | 60.0 | 59.7 |
| Fixed-interest securities | 40.0 | 40.3 |
| **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. Accordingly, at the reporting date, the plan assets were made up of 60% equity and 40% debt instruments. 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 | 2016 | 2015 |
|---|---|---|
| Current service cost | 17.1 | 17.1 |
| Past service cost | | 0.7 |
| **Total service cost** | **17.1** | **17.8** |
| Interest cost | 16.8 | 14.1 |
| Interest income on plan assets | –1.0 | –1.0 |
| **Net interest cost** | **15.8** | **13.1** |
| **Interest expense for one-time capital payments (included in liabilities)** | **0.5** | **0.2** |
| **Total expense** | **33.4** | **31.1** |

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 the following distribution of pension benefit payments in the coming years. This information is used to calculate pension provisions and the amount of pension obligations:

Expected yearly amount of pension benefit payments

| in € million | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|
| Expected yearly amount of pension benefit payments | 28.2 | 30.1 | 33.0 | 36.5 |

The expected yearly amount of pension benefit payments is based on the assumption that beneficiaries will choose the standard option, which in the case of administrative 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) 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 | 2016 | 2015 |
|---|---|---|
| Discount rate 50 basis points higher | –57.6 | –53.7 |
| Discount rate 20 basis points lower | 24.7 | 21.9 |
| Pension trend 50 basis points higher | 14.4 | 14.6 |
| Assumed life expectancy 1 year higher | 13.5 | 13.7 |

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 € 6.8 million at the reporting date (2015: € 31.1 million) comprises German corporation and municipal trade tax plus taxes on the income of group companies outside Germany.

Income tax payable

| in € million | 2016 | 2015 |
|---|---|---|
| **Balance at January 1** | **31.1** | **30.3** |
| Utilized | –31.1 | –30.3 |
| Allocated | 6.8 | 31.1 |
| **Balance at December 31** | **6.8** | **31.1** |

The income tax liabilities are due for payment within one year.

# 27. Other provisions

Other provisions

| | Total | | Non-current | | Current | |
|---|---|---|---|---|---|---|
| in € million | Dec. 31, 2016 | Dec. 31, 2015 | Dec. 31, 2016 | Dec. 31, 2015 | Dec. 31, 2016 | Dec. 31, 2015 |
| Warranty obligations and risks from pending losses on onerous contracts | 199.1 | 176.1 | 0.9 | 4.5 | 198.2 | 171.6 |
| Personnel obligations | 68.1 | 73.7 | 11.6 | 17.0 | 56.5 | 56.7 |
| Losses arising from the settlement of accounts | 211.5 | 90.4 | | | 211.5 | 90.4 |
| Subsequent costs | 132.5 | 137.1 | | | 132.5 | 137.1 |
| Other obligations | 96.5 | 42.7 | 10.9 | 3.3 | 85.6 | 39.4 |
| **Total other provisions** | **707.7** | **520.0** | **23.4** | **24.8** | **684.3** | **495.2** |

Non-current other provisions developed as follows:

Non-current other provisions 2016

| in € million | Balance at Jan. 1, 2016 | Transferred | Utilized | Allocated | Discount reversed | Balance at Dec. 31, 2016 |
|---|---|---|---|---|---|---|
| Warranty obligations and risks from pending losses on onerous contracts | 4.5 | | –3.6 | | | 0.9 |
| Personnel obligations | 17.0 | –10.4 | | 4.8 | 0.2 | 11.6 |
| Other obligations | 3.3 | | | 7.6 | | 10.9 |
| **Total non-current other provisions** | **24.8** | **–10.4** | **–3.6** | **12.4** | **0.2** | **23.4** |

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, 2016 | Expected cash outflow 2018 |
|---|---|---|
| Personnel obligations | 11.6 | 4.9 |
| Other obligations | 11.8 | 5.0 |
| **Total expected cash outflow from non-current other provisions** | **23.4** | **9.9** |

Expected cash outflow from non-current other provisions

| in € million | Carrying amount Dec. 31, 2015 | Expected cash outflow 2017 |
|---|---|---|
| Personnel obligations | 17.0 | 9.4 |
| Other obligations | 7.8 | 2.5 |
| **Total expected cash outflow from non-current other provisions** | **24.8** | **11.9** |

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 2016

| in € million | Balance at Jan. 1, 2016 | Transferred | Utilized | Dissolved | Allocated | Translation differences | Balance at Dec. 31, 2016 |
|---|---|---|---|---|---|---|---|
| Warranty obligations and risks from pending losses on onerous contracts | 171.6 | | –35.8 | –3.9 | 66.6 | –0.3 | 198.2 |
| Personnel obligations | 56.7 | 10.4 | –55.9 | –0.2 | 45.4 | 0.1 | 56.5 |
| Losses arising from the settlement of accounts | 90.4 | | –32.3 | –2.6 | 155.3 | 0.7 | 211.5 |
| Subsequent costs | 137.1 | | –79.6 | –0.2 | 76.0 | –0.8 | 132.5 |
| Other obligations | 39.4 | | –10.9 | –0.5 | 57.8 | –0.2 | 85.6 |
| **Total current other provisions** | **495.2** | **10.4** | **–214.5** | **–7.4** | **401.1** | **–0.5** | **684.3** |

The cash outflows resulting from the carrying amounts of 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 € 192.1 million (2015: € 169.9 million) for liabilities associated with warranty obligations in connection with the delivery of goods and services.

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 € 7.0 million (2015: € 6.2 million) was recognized to cover the difference. When measuring and recognizing this provision, priority 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 € 4.5 million (2015: € 4.4 million). The provisions for preretirement part-time working arrangements are based on the collective agreement on phased retirement and related works agreements. On the basis of these agreements, obligations amounting to € 10.6 million (2015: € 10.8 million) were recognized at December 31, 2016. As in the previous year, corresponding plan assets amounting to € 11.2 million were deducted prior to recognition. A further line item is provisions for profit-sharing bonuses, which amounted to € 51.6 million (2015: € 57.1 million). These relate to the annual performance bonus for the Executive Board, senior managers, employees covered by the collective wage agreement and exempt employees.

In the reporting period, the compensation system for members of the Executive Board and senior managers was altered. As described in the Notes to the consolidated financial statements in the 2015 Annual Report, the outstanding, deferred components of the annual performance bonus (APB) granted to senior managers was paid out in full in the form of a cash settlement in 2016, whereas the deferred components of the Executive Board's compensation granted under the previous system will continue to be paid according to the previous agreement.

Under the terms of the new 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 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 group KPIs in the current financial year, and a component reflecting the employee's personal performance, which is recompensed in cash in the following calendar 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.

**Losses arising from the settlement of accounts**

Losses arising from the settlement of accounts relate to retrospective adjustments to contractual prices agreed with customers; this refers particularly to consortium leaders and public-sector customers in the OEM segment and to commercial customers in the MRO segment. The increase in the reporting period is consistent with the revenues realized from spare parts sales, which 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 carrying amount of this provsion decreased slightly in 2016 because the amount utilized was slightly higher than the amount allocated.

**Other obligations**

Provisions for other obligations principally cover obligations recognized as a result of delays in the delivery schedule for commercial engine programs in which MTU is a partner, along with a multitude of risks and contingent liabilities which, considered individually, are judged to be of immaterial importance.

# 28. Financial liabilities

Financial liabilities

| | Total | | Non-current | | Current | |
|---|---|---|---|---|---|---|
| in € million | Dec. 31, 2016 | Dec. 31, 2015 | Dec. 31, 2016 | Dec. 31, 2015 | Dec. 31, 2016 | Dec. 31, 2015 |
| Bonds and notes | 353.6 | 353.2 | 97.9 | 347.2 | 255.7 | 6.0 |
| Convertible bond | 474.6 | | 474.2 | | 0.4 | |
| Financial liability arising from IAE-V2500 stake increase | 400.3 | 419.6 | 345.2 | 367.1 | 55.1 | 52.5 |
| Financial liabilities arising from other program participations | 91.7 | 111.8 | 24.6 | 56.0 | 67.1 | 55.8 |
| Financial liabilities to banks | | | | | | |
| Note purchase agreement | 30.1 | 30.1 | 30.0 | 30.0 | 0.1 | 0.1 |
| Revolving credit facility | | 99.1 | | | | 99.1 |
| Other liabilities to banks | | 20.0 | | | | 20.0 |
| Finance lease liabilities | 11.6 | 12.9 | 10.2 | 11.6 | 1.4 | 1.3 |
| **Total gross financial debt** | **1,361.9** | **1,046.7** | **982.1** | **811.9** | **379.8** | **234.8** |
| Derivatives without hedging relationship | 29.7 | 38.3 | 0.2 | 22.3 | 29.5 | 16.0 |
| Derivatives with hedging relationship | 86.4 | 102.9 | 25.8 | 27.4 | 60.6 | 75.5 |
| Personnel-related financial liabilities | 37.7 | 30.6 | 24.3 | 14.1 | 13.4 | 16.5 |
| Other financial liabilities | | | | | | |
| Repayment of grants toward development costs | 30.5 | 38.5 | 21.3 | 29.3 | 9.2 | 9.2 |
| Sundry other financial liabilities | 155.4 | 165.2 | 2.7 | 5.2 | 152.7 | 160.0 |
| **Total other financial liabilities** | **339.7** | **375.5** | **74.3** | **98.3** | **265.4** | **277.2** |
| **Total financial liabilities** | **1,701.6** | **1,422.2** | **1,056.4** | **910.2** | **645.2** | **512.0** |

**Bonds and notes**

In order to finance the purchase price components of the increase in the company's stake 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 earns 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 is payable in arrears on June 21 of each year. The bond, including transaction costs and a discount of € 1.5 million, was recognized at amortized cost.

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 to both bonds 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 bonds. 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 bonds or to MTU and no rating agency awards an investment grade rating to the bond 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 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 an 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 arising from the increase and acquisitions of program shares**

These items include both 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 stake 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. For a detailed description of the initial measurement of the IAE-V2500 stake increase, please refer to page 129 et seq. of the 2012 Annual Report.

*Financial liabilities arising from other program participations*

The financial liabilities arising from other program participations mainly relate to deferred program entry payments for the PW1000G family of GTF engines, the PW800, and the LM6000-PF+.

**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 (2015: € 400.0 million) with five banks, which runs until October 28, 2021. This facility was increased and renewed for a further year in 2016. 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 € 13.8 million had been drawn down for guarantees in favor of third parties under this facility at December 31, 2016 (2015: € 113.7 million, € 14.6 million of which 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 adjusted EBITDA) at the end of each quarter shall not exceed 3.0; the times interest earned ratio (adjusted EBITDA in relation to the consolidated net interest expense) at the end of each quarter shall not fall below 4.0. These financial indicators are obtained from the quarterly interim financial reports.

**Finance lease liabilities**

Finance lease liabilities represent obligations under finance lease arrangements that are capitalized and amortized using the effective interest rate method; see Note 15 (Property, plant and equipment).

**Liabilities arising out of derivatives**

The financial liabilities arising out of derivatives stem from the portfolio of derivative financial instruments in the amount of € 116.1 million (2015: € 141.2 million) held at the reporting date for the purpose of hedging exchange-rate and commodity-price risks. The reduction in these liabilities is due in particular to a favorable development of the fair value of forward foreign exchange contracts.

**Personnel-related financial liabilities**

Personnel-related financial liabilities amounting to € 37.7 million (2015: € 30.6 million) mainly result from claims for one-time and instalment payments from the company pension scheme amounting to € 26.0 million (2015: € 15.4 million). In addition, obligations under the MAP employee stock option program of € 6.0 million (2015: € 5.7 million), which the Executive Board of MTU Aero Engines AG, Munich, offered again in the financial year 2016, 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 option program in the financial years 2016 and 2015 was as follows:

MAP employee stock option 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 2016 | 177,086 | 3.6 | 14.5 | 82.26 |
| June 2015 | 106,336 | 2.0 | 8.9 | 84.07 |

The total expense for the matching exercise in connection with the MAP employee stock option program in the financial year 2016 amounted to € 4.8 million (2015: € 4.7 million).

The purchase price for the MTU shares allocated in the financial year 2016 amounted to € 82.26 per share. The shares transferred to the employees, measured at the average acquisition cost, were removed from the equity item "treasury shares". The difference between the proceeds of the sale and the original acquisition cost amounted to € 10.9 million (2015: € 6.9 million) and 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 2015, a total amount of € 24.9 million was repaid and in 2016 a further € 9.4 million.

**Sundry other financial liabilities**

The sundry other financial liabilities totaling € 155.4 million (2015: € 165.2 million) include an amount of € 111.0 million (2015: € 111.4 million) relating to obligations arising from externally acquired development services for the PW1000G family and PW800 engine programs. This item also includes customer credit amounting to € 13.7 million (2015: € 23.0 million) and numerous other smaller amounts relating to individual obligations arising from contracts with suppliers and customers.

## 29. Trade payables

Trade payables

| in € million | Dec. 31, 2016 | Dec. 31, 2015 |
|---|---|---|
| Accounts payable to: | | |
| Third parties | 578.5 | 606.6 |
| Related companies | 56.4 | 66.8 |
| **Total trade payables** | **634.9** | **673.4** |

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, 2016 | Dec. 31, 2015 |
|---|---|---|
| Advance payments received for construction contracts | 329.4 | 471.4 |
| Amount of above offset against construction contract receivables | –206.8 | –263.2 |
| Advance payments received for service business | 221.6 | 165.6 |
| **Total construction contract and service business payables** | **344.2** | **373.8** |

The stated amounts for advance payments received relate to future deliveries of engine modules and parts, and to the provision of engine maintenance services.

## 31. Other liabilities

Other liabilities

| in € million | Dec. 31, 2016 | Dec. 31, 2015 |
|---|---|---|
| Personnel-related liabilities | | |
| Social security | 1.6 | 1.9 |
| Other personnel-related liabilities | 30.2 | 27.7 |
| Other tax liabilities | 8.5 | 12.8 |
| Sundry other liabilities | 1.8 | 0.4 |
| **Total other liabilities** | **42.1** | **42.8** |

**Personnel-related liabilities**

The social security liabilities comprise an amount of € 1.5 million (2015: € 1.7 million) representing liabilities to health insurance providers and an amount of € 0.1 million (2015: € 0.2 million) representing liabilities to insurance schemes for occupational accidents. Other personnel-related liabilities concern vacation entitlements and flex-time credits.

**Other tax liabilities**

The other tax liabilities concern payable wage and church taxes, solidarity surcharges, and domestic and foreign transactional taxes.

The total amount of other liabilities is due within one year.

# 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 2016

| in € million | Category as defined in IAS 39 / other categories | Carrying amount Dec. 31, 2016 |
|---|---|---|
| **ASSETS** | | |
| **Other 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 increase and acquisitions of program shares | FLAC | 492.0 |
| Other gross financial debt | FLAC | 30.1 |
| Derivative financial liabilities | | |
| Derivatives without hedging relationship | FLHfT | 29.7 |
| Derivatives with hedging relationship | n.a. | 86.4 |
| Finance lease liabilities | n.a. | 11.6 |
| 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 |
| | | | | | | | |
| | | | 29.7 | | | 29.7 | 29.7 |
| | | 86.4 | | | | 86.4 | 86.4 |
| | | | | 11.6 | | 11.6 | 11.6 |
| 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 |

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 2015:

Disclosures relating to financial instruments
Carrying amounts, measurement / recognition methods and fair values aggregated by category 2015

| in € million | Category as defined in IAS 39 / other categories | Carrying amount Dec. 31, 2015 |
|---|---|---|
| **ASSETS** | | |
| **Other financial assets** | | |
| Loans, receivables, other financial assets | LaR | 95.1 |
| Available-for-sale financial assets | AfS | 44.0 |
| Trade receivables | LaR | 708.5 |
| Construction contract and service business receivables | LaR | 301.3 |
| **Derivative financial assets** | | |
| Derivatives without hedging relationship | FAHfT | 0.2 |
| Derivatives with hedging relationship | n.a. | 0.7 |
| Cash and cash equivalents | LaR | 53.1 |
| **EQUITY AND LIABILITIES** | | |
| Trade payables | FLAC | 673.4 |
| **Financial liabilities** | | |
| Bonds and notes | FLAC | 353.2 |
| Financial liabilities arising from increase and acquisitions of program shares | FLAC | 531.4 |
| Other gross financial debt | FLAC | 149.2 |
| Derivative financial liabilities | | |
| Derivatives without hedging relationship | FLHfT | 38.3 |
| Derivatives with hedging relationship | n.a. | 102.9 |
| Finance lease liabilities | n.a. | 12.9 |
| Other financial liabilities | FLAC / n.a. | 234.3 |
| **Thereof aggregated by category as defined in IAS 39** | | |
| Loans and receivables | LaR | 1,158.0 |
| Available-for-sale financial assets | AfS | 44.0 |
| Financial assets held for trading | FAHfT | 0.2 |
| Financial liabilities measured at amortized cost | FLAC / n.a. | 1,941.5 |
| Financial liabilities held for trading | FLHfT | 38.3 |

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, 2015 |
|---|---|---|---|---|---|---|---|
| Measured at amortized cost | Measured at cost | Fair value recognized in equity | Fair value recognized in income statement | | | | |
| | | | | | | | |
| | | | | | | | |
| 94.2 | | | | | 0.9 | 95.1 | 95.1 |
| | 6.1 | 37.9 | | | | 44.0 | 44.0 |
| 708.5 | | | | | | 708.5 | 708.5 |
| 301.3 | | | | | | 301.3 | 301.3 |
| | | | | | | | |
| | | | 0.2 | | | 0.2 | 0.2 |
| | | 0.7 | | | | 0.7 | 0.7 |
| 53.1 | | | | | | 53.1 | 53.1 |
| | | | | | | | |
| 673.4 | | | | | | 673.4 | 673.4 |
| | | | | | | | |
| 353.2 | | | | | | 353.2 | 361.1 |
| 531.4 | | | | | | 531.4 | 534.8 |
| 149.2 | | | | | | 149.2 | 149.2 |
| | | | | | | | |
| | | | 38.3 | | | 38.3 | 38.3 |
| | | 102.9 | | | | 102.9 | 102.9 |
| | | | | 12.9 | | 12.9 | 12.9 |
| 203.7 | | | | | 30.6 | 234.3 | 237.4 |
| | | | | | | | |
| 1,157.1 | | | | | 0.9 | 1,158.0 | 1,158.0 |
| | 6.1 | 37.9 | | | | 44.0 | 44.0 |
| | | | 0.2 | | | 0.2 | 0.2 |
| 1,910.9 | | | | | 30.6 | 1,941.5 | 1,955.9 |
| | | | 38.3 | | | 38.3 | 38.3 |

Cash and cash equivalents, trade receivables and other receivables 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. As a rule, trade payables and other payables are due within a relatively short time. The amounts recognized for these liabilities therefore correspond approximately to their fair value at the reporting date.

**Classification of fair-value measurements of financial assets and liabilities according to the fair-value hierarchy**

In order to evaluate the significance of the factors used as input when measuring 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 2016 and 2015:

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** |

Classification within the fair-value hierarchy for the financial year 2015

| in € million | Level 1 | Level 2 | Level 3 | Total |
|---|---|---|---|---|
| **Financial assets measured at fair value** | | | | |
| Derivative financial instruments | | 0.9 | | 0.9 |
| Available-for-sale financial assets | | 37.9 | | 37.9 |
| **Total financial assets** | | **38.8** | | **38.8** |
| **Financial liabilities measured at fair value** | | | | |
| Derivative financial instruments | | 141.2 | | 141.2 |
| **Total financial liabilities** | | **141.2** | | **141.2** |

The fair value of the derivative financial instruments and securities assigned to level 2 is measured using the discounted cash flow (DCF) method. The fair value of available-for-sale financial assets corresponds 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 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 increase and acquisitions of program shares | 492.0 | | | 122.2 | | | 78.2 | | | 56.5 | | | 299.1 |
| Other gross financial debt | 30.1 | | 0.3 | | | 0.3 | | | 0.4 | | | 0.5 | 30.0 |
| 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 | | | |
| Finance lease liabilities | 11.6 | 0.3 | | 1.4 | 0.3 | | 1.5 | 0.3 | | 1.3 | 2.4 | | 7.4 |
| Other financial liabilities | 223.6 | | | 175.3 | | | 15.4 | | | 12.3 | | | 27.2 |

Payment cash flows for financial liabilities 2015

| | | Cash flow 2016 | | | Cash flow 2017 | | | Cash flow 2018 | | | Cash flow 2019 ff | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| in € million | Carrying amount Dec. 31, 2015 | Fixed interest | Variable interest | Principal | Fixed interest | Variable interest | Principal | Fixed interest | Variable interest | Principal | Fixed interest | Variable interest | Principal |
| Trade payables | 673.4 | | | 673.4 | | | | | | | | | |
| Bonds and notes | 353.2 | 11.0 | | | 11.0 | | 250.0 | 3.6 | | | 35.5 | | 100.0 |
| Financial liabilities arising from increase and acquisitions of program shares | 531.4 | | | 108.5 | | | 89.6 | | | 74.7 | | | 339.7 |
| Other gross financial debt | 149.2 | | 0.5 | 119.2 | | 0.5 | | | 0.5 | | | 1.2 | 30.0 |
| Derivative financial liabilities | | | | | | | | | | | | | |
| Derivatives without hedging relationship | 38.3 | | | 16.0 | | | 22.3 | | | | | | |
| Derivatives with hedging relationship | 102.9 | | | 75.5 | | | 24.6 | | | 2.8 | | | |
| Finance lease liabilities | 12.9 | 0.4 | | 1.4 | 0.3 | | 1.3 | 0.3 | | 1.4 | 2.7 | | 8.8 |
| Other financial liabilities | 234.3 | | | 185.7 | | | 14.2 | | | 11.7 | | | 27.1 |

The statement includes all instruments in the portfolio at December 31, 2016 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, 2016. 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. They are provided in two basic forms: predelivery payment (PDP) and backstop commitments. In both cases, any funds made available to the purchaser are always transferred directly to the aircraft manufacturer by the consortium leader.

MTU classifies loan commitments offered up to the reporting date totaling a nominal amount, translated into euros, of € 387.5 million (2015: € 404.6 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.

There are several reasons for this. Firstly, the proposed financing agreement does not become effective until it is taken up in contractual form. In this respect, it should be noted that the conditions of the loan are at least equivalent to normal market conditions 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 view of the offered modes of financing. 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 2016 and 2015. 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 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** |

Net gain / loss on financial instruments by category 2015

| Aggregated by category as defined in IAS 39 | from interest | from investments | from remeasurement | | | from disposal | Net gain / loss 2015 |
|---|---|---|---|---|---|---|---|
| in € million | | | at fair value through profit or loss | currency translation | valuation allowances | | |
| Loans and receivables (LaR) | 2.1 | | | 39.1 | –1.5 | | 39.7 |
| Available-for-sale financial assets (AfS) | 1.9 | 1.9 | | | | | 3.8 |
| Financial assets held for trading (FAHfT) | | | 41.5 | | | | 41.5 |
| Financial liabilities measured at amortized cost (FLAC) | –3.5 | | –18.3 | –52.3 | | | –74.1 |
| Financial liabilities held for trading (FLHfT) | | | –74.1 | | | | –74.1 |
| Financial instruments not within the scope of IFRS 7 or IAS 39 | | 29.1 | | 7.8 | | | 36.9 |
| **Total** | **0.5** | **31.0** | **–50.9** | **–5.4** | **–1.5** | | **–26.3** |

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 (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. Moreover, gains / losses arising from translation differences on trade receivables and payables are recognized under revenues or cost of sales 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 € 12.8 million (2015: € 3.5 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.

Gains amounting to € 24.1 million (2015: € 39.1 million) from the currency translation of financial assets classified as "loans and receivables" are mainly attributable to the measurement of trade receivables. These gains are offset principally by currency translation losses amounting to € 36.7 million (2015: € 52.3 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 individual 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 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, 2016 Deferred tax assets | Dec. 31, 2016 Deferred tax liabilities | Dec. 31, 2015 Deferred tax assets | Dec. 31, 2015 Deferred tax liabilities | 2016 Tax income / expense (-) in income statement | 2016 in equity |
|---|---|---|---|---|---|---|
| | in the balance sheet | | in the balance sheet | | | |
| **Assets** | | | | | | |
| Intangible assets | 0.1 | 248.8 | 0.1 | 243.1 | –8.3 | 2.6 |
| Property, plant and equipment | 5.1 | 47.8 | 4.4 | 48.6 | 1.7 | –0.2 |
| Financial assets | | 3.8 | | 2.3 | –1.5 | |
| Inventories | 4.2 | 1.1 | 4.3 | 1.0 | –0.2 | |
| Receivables and other assets | 1.1 | 3.7 | 0.8 | 3.8 | 0.5 | –0.1 |
| **Total assets** | **10.5** | **305.2** | **9.6** | **298.8** | **–7.8** | **2.3** |
| **Equity** | | | | | | |
| Balance of hedging instrument assets and liabilities | 34.0 | | 36.8 | | | –2.8 |
| Equity portion of convertible bond | | 7.7 | | | | –7.7 |
| Actuarial gains and losses on plan assets and pension obligations | 122.3 | | 96.7 | | | 25.6 |
| **Total equity** | **156.3** | **7.7** | **133.5** | | | **15.1** |
| **Liabilities** | | | | | | |
| Pension provisions | 1.9 | 1.8 | 5.6 | 1.6 | –3.8 | –0.1 |
| Other provisions | 33.8 | 0.3 | 22.5 | 0.3 | 11.2 | 0.1 |
| Liabilities | 138.5 | 0.7 | 152.5 | | –13.0 | –1.7 |
| **Total liabilities** | **174.2** | **2.8** | **180.6** | **1.9** | **–5.6** | **–1.7** |
| **Deferred taxes on assets and liabilities** | **341.0** | **315.7** | **323.7** | **300.7** | **–13.4** | **15.7** |
| **Tax credits and tax losses available for carry-forward** | | | | | | |
| Tax credits available for carry-forward | 26.9 | | 24.0 | | 3.6 | –0.7 |
| Tax losses available for carry-forward | 25.3 | | 25.1 | | 1.6 | –1.4 |
| **Valuation allowances and unrecognized recoverable tax payments** | | | | | | |
| Valuation allowances on tax credits carried forward | –8.9 | | –8.3 | | –0.9 | 0.3 |
| Valuation allowances on tax losses carried forward | –13.9 | | –19.0 | | 4.3 | 0.8 |
| Temporary differences for which no deferred tax assets were recognized | –21.6 | | –25.5 | | 3.2 | 0.7 |
| **Tax credits and losses carried forward** | **7.8** | | **–3.7** | | **11.8** | **–0.3** |
| **Deferred taxes / liabilities before offset** | **348.8** | **315.7** | **320.0** | **300.7** | **–1.6** | **15.4** |
| Offset | –292.2 | –292.2 | –278.0 | –278.0 | | |
| **Net deferred tax assets / liabilities** | **56.6** | **23.5** | **42.0** | **22.7** | **–1.6** | **15.4** |

Reference is made to Note 10 (Income taxes) for further information relating to actual 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. 2016 | Poland 2016 | Total 2016 | Total 2015 |
|---|---|---|---|---|
| Unused tax losses | 7.0 | 119.4 | 126.4 | 112.6 |
| Tax credits available for carry-forward | 1.0 | 25.9 | 26.9 | 24.0 |
| **Potential tax impact of tax losses / credits available for carry-forward** | **3.6** | **48.6** | **52.2** | **49.1** |
| Valuation allowance on tax credits carried forward | | –8.9 | –8.9 | –19.0 |
| Valuation allowance on tax losses carried forward | –1.8 | –12.1 | –13.9 | –8.3 |
| **Balance sheet effect of deferred tax assets on tax losses / credits available for carry-forward** | **1.8** | **27.6** | **29.4** | **21.8** |

**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. This allowed tax losses in respect of federal tax available for carry-forward at December 31, 2015 amounting to € 10.8 million to be utilized in the reporting period, thus reducing the amount of unused tax losses to € 0.7 million at December 31, 2016.

In addition, tax losses in respect of state tax were also available. In the interests of efficient reporting practice, the stated amount of these tax losses available for carry-forward was calculated using the respective basic tax rates for U.S. companies.

The tax losses available for carry-forward were adjusted in view of the relevant income expectations for the next five years and, in contrast to the previous year, deemed to be of material interest and thus recognized as deferred tax assets. In the United States, tax losses can be carried forward for 20 years.

Claims from tax credits continue to be recognized for the tax unit. These are mainly the future offsetting of minimum taxes paid in years in which losses were made. 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 profits it expects to achieve through its production activities, with separate amounts being accorded each year through to 2026. Deferred tax assets amounting to € 17.0 million (2015: € 15.7 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 totaling € 119.4 million. These tax losses 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 € 10.6 million (2015: € 5.8 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 € 113.8 million (2015: € 133.5 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 € 21.6 million (2015: € 25.3 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 € 162.0 million (2015: € 155.7 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 € 24.4 million (2015: € 10.6 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, 2016, was calculated in order to determine their respective recoverable amounts, based on the operational planning data for the second year of the assessment period. 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 7.3% p.a. (2015: 7.5% p.a.), EBITDA margins of between 13.5% and 14.1% (2015: 12.0% – 14.8%), and a discount rate before tax of 8.3% (2015: 9.2%). 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 6.7% p.a. (2015: 9.4% p.a.), EBITDA margins of between 11.1% and 12.0% (2015: 10.5% – 12.8%), and a discount rate before tax of 8.4% (2015: 9.3%). 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 1.0%, a market risk premium of 6.00%, and a beta coefficient of 0.95. The cost of debt capital was 1.95% after tax.

The recognized amount of goodwill in the OEM segment (commercial and military engine business) was unchanged compared with 2015, at € 304.4 million, and the recognized amount for goodwill in the MRO segment (commercial maintenance business) was € 87.8 million (2015: € 87.7 million). The increase 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 € 5,334.6 million, and that of the MRO segment is € 2,167.7 million. The corresponding carrying amounts of the cash-generating units are € 2,396.8 million for the OEM segment and € 752.4 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 in Chinese yuan renminbi, 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, 2016, MTU held forward foreign exchange contracts for a contractual period up to April 2019 to sell a nominal volume of U.S. $ 1,680.0 million (which translates to € 1,593.8 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 € 16.2 million in 2016 (2015: negative equity impact of € 30.8 million). At December 31, 2015, MTU had hedged cash flows for the financial years 2016–2018 amounting to U.S. $ 1,080.0 million (which translates to € 1,083.9 million at the exchange rate prevailing at December 31, 2015).

The open forward foreign exchange contracts at the reporting date have the following maturities:

Forward foreign exchange contracts

| in U.S. $ million | 2016 | 2015 |
|---|---|---|
| 2016 | | 630.0 |
| 2017 | 800.0 | 420.0 |
| 2018 | 650.0 | 130.0 |
| 2019 | 230.0 | |
| **Total** | **1,680.0** | **1,180.0** |
| **Translated into € at the exchange rate prevailing on the reporting date** | **1,593.8** | **1,083.9** |

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. $ 489.2 million (2015: U.S. $ 539.7 million), which translates to € 464.1 million (2015: € 495.7 million) at the exchange rate prevailing at the reporting date.

In the financial year 2016, a loss of € 69.4 million (2015: € 88.7 million) was realized from transactions involving forward foreign exchange contracts that formed part of effective cash flow hedging relationships, and recognized under revenues in the income statement. An additional loss of € 3.5 million (2015: € 17.1 million) was also recognized under revenues in respect of the fair value of open forward foreign exchange contracts for which the designated underlying transaction had been accounted for at December 31, 2016. In addition, at the reporting date, fair value losses on forward foreign exchange contracts amounting to € 44.3 million, net of deferred taxes (2015: € 57.7 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.

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 option transactions

Simple option transactions enable 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 these transactions is limited to the premiums that have already been paid. At December 31, 2016, MTU held put options amounting to U.S. $ 20.0 million (2015: U.S. $ 20.0 million). In addition to these simple options, MTU also holds short-position options, which were concluded in order to reduce the amount paid in premiums. Losses exceeding the amount of premiums received for these options can be incurred if the exchange rate falls since MTU is obliged to sell U.S. dollars at a previously agreed euro/U.S. dollar exchange rate. At December 31, 2016, the volume of options sold amounted to U.S. $ 40.0 million (2015: U.S. $ 40.0 million).

### Currency swaps

During the financial year 2016, 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, 2016, a currency swap line was in place covering a total nominal amount of U.S. $53.3 million (2015: U.S. $26.0 million), with a maturity date of January 3, 2017.

### Collective forward transactions

At December 31, 2016, MTU held open forward foreign exchange contracts in the form of collective forward transactions for a nominal amount of U.S. $80.0 million. The contract-specific hedging rates lie between 1.2825 and 1.3160 U.S. dollars to the euro for maturity dates in 2017. If the effective daily rate of the U.S. dollar lies within the corridor specified in a given contract, a fixed volume of U.S. dollars is hedged. If the rate is above the corridor, no volume is hedged; if it is below the corridor, the volume is doubled. The corridors specified in the contracts lie between 1.25 and 1.43 U.S. dollars to the euro. The negative fair value of these contracts amounted to € 25.7 million at the reporting date (2015: € 35.1 million). This amount was recognized in the balance sheet under financial liabilities, while the change in the amount compared with the prior period 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 earnings after tax 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 are already denoted in the functional currency 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, 2016, 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 earnings after tax and equity:

Exchange rate sensitivity analysis

| | 2016 | | 2015 | |
|---|---|---|---|---|
| in € million | - 10 % | + 10 % | - 10 % | + 10 % |
| **Exchange rate sensitivity (€ / U.S. $)** | | | | |
| Closing exchange rate Dec. 31, 2016: 1.0541 (Dec. 31, 2015: 1.0887) | 0.95 | 1.16 | 0.98 | 1.20 |
| **Earnings after tax** | **–21.0** | **15.6** | **–41.8** | **–32.4** |
| **Equity** [1] | **–129.7** | **112.2** | **–100.1** | **88.5** |
| Thereof: hedge reserve (fair value) [1] | –138.3 | 119.3 | –105.3 | 92.8 |

[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, earnings after tax, 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 earnings after tax 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 earnings after tax 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 2016, 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, 2016, MTU had concluded forward commodity sales contracts with financial institutions for a volume of 450 metric tons of nickel (2015: 200 metric tons) for the years 2017 to 2019 and contracted fixed prices for nickel between U.S. $10,200 and 14,300 per metric ton (2015: between U.S. $10,200 – 15,800 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 losses of € 0.3 million (2015: € 0.9 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, earnings after tax would have been € 0.4 million higher or lower, respectively (2015: € 0.1 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

Contingent liabilities

| in € million | Dec. 31, 2016 | Dec. 31, 2015 |
|---|---|---|
| Contingent liabilities arising from risk- and revenue-sharing partnerships with: | | |
| IAE International Aero Engines AG | 24.1 | 47.1 |
| Pratt & Whitney Aircraft Company | 2.7 | 2.6 |
| General Electric Company | 0.9 | 0.8 |
| **Subtotal** | **27.7** | **50.5** |
| Guarantees and other contingent liabilities | 8.3 | 10.9 |
| **Total contingent liabilities** | **36.0** | **61.4** |

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).

Guarantees and other contingent liabilities relate to investment grants and amount to € 8.3 million (2015: € 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.

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 amount to € 15 million. As in 2015, MTU currently does not consider this eventuality to be a material tax risk.

## 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 € 31.8 million (2015: € 20.4 million) were expensed in the financial year 2016.

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, 2016 | Dec. 31, 2015 |
|---|---|---|
| Due in less than one year | 19.8 | 13.2 |
| Due in more than one year and less than five years | 31.6 | 29.6 |
| Due in more than five years | 2.9 | 4.0 |
| **Total future minimum lease payments** | **54.3** | **46.8** |

The nominal total of future minimum lease payments amounted to € 54.3 million at December 31, 2016, which is € 7.5 million higher than the previous year's amount of € 46.8 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.

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.
- 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. One of these contracts includes a renewal option for a further 5 years.
- 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.
- Rental 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, 2016, the future minimum income from sublease agreements for office space amounted to € 3.4 million (2015: € 6.6 million). The total future minimum expenses associated with sublease agreements amount to € 2.2 million (2015: € 6.2 million). Payments amounting to € 1.5 million (2015: € 0.8 million) for these sublease agreements were recognized as an expense in the financial year 2015.

**Order commitments for financial obligations**
At December 31, 2016, order commitments for the purchase of intangible assets amounted to € 9.8 million (2015: € 7.2 million) and order commitments for the purchase of property, plant and equipment amounted to € 48.2 million (2015: € 31.9 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 2016 and 2015 are presented in the following tables:

## Accounts receivable from related companies

| | Outstanding balance | | Value of business transactions | | | |
|---|---|---|---|---|---|---|
| | Receivables | | Revenues / income / sales | | Expenses / purchases | |
| in € million | Dec. 31, 2016 | Dec. 31, 2015 | 2016 | 2015 | 2016 | 2015 |
| EUROJET Turbo GmbH, Hallbergmoos | 5.8 | 15.1 | 183.8 | 185.5 | –10.9 | –1.7 |
| EPI Europrop International GmbH, Munich | 36.3 | 32.2 | 127.3 | 114.8 | –5.6 | –6.7 |
| International Aero Engines LLC, East Hartford, Connecticut, USA | 46.9 | 8.3 | 168.8 | 8.2 | –76.3 | |
| MTU Turbomeca Rolls-Royce ITP GmbH, Hallbergmoos | 1.2 | 2.8 | 16.9 | 9.1 | –0.7 | –0.1 |
| Pratt & Whitney Canada Customer Service Centre Europe GmbH, Ludwigsfelde | 8.9 | 2.9 | 58.9 | 54.9 | –2.9 | |
| Ceramic Coating Center S.A.S., Paris, France | 0.1 | 0.1 | | | –2.1 | –3.6 |
| Turbo Union Ltd., Bristol, England | 16.7 | 2.3 | 80.3 | 82.6 | | |
| MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China | | 2.0 | | 6.7 | | –55.2 |
| Middle East Propulsion Company Ltd., Riyadh, Saudi Arabia[1] | | 0.3 | 1.2 | 0.4 | –1.6 | –1.4 |
| Gesellschaft zur Entsorgung von Sondermüll in Bayern GmbH, Munich | | | | | –0.2 | –0.2 |
| Sumisho Aero Engines Lease B.V., Amsterdam, Netherlands | 0.7 | 0.2 | 0.6 | 0.4 | –2.2 | –5.4 |
| MTU Maintenance Service Centre Australia Pty. Ltd., Perth, Australia | | | 0.1 | 0.2 | –0.9 | –0.7 |
| AES Aerospace Embedded Solutions GmbH, Munich | | | 1.3 | 0.9 | –3.0 | –7.7 |
| MTU Maintenance Dallas Inc., Grapevine, USA | 0.1 | 0.2 | 0.3 | 0.2 | –0.8 | –0.5 |
| MTU Maintenance IGT Sevice do Brasil Ltda., São Paulo, Brazil | 0.2 | 0.1 | 0.1 | | –1.1 | –0.4 |
| MTU Maintenance Service Center Ayutthaya Ltd., Ayutthaya, Thailand | 0.3 | 1.1 | | 0.8 | –0.8 | –0.7 |
| **Total** | **117.2** | **67.6** | **639.6** | **464.7** | **–109.1** | **–84.3** |

[1] MTU's share in this company was sold on December 21, 2016: for more information see change in composition of group reporting entity in Part I of these Notes (Accounting policies and principles)

## Liabilities to related companies

| | Outstanding balance | | Value of business transactions | | | |
|---|---|---|---|---|---|---|
| | Liabilities | | Revenues / income / sales | | Expenses / purchases | |
| in € million | Dec. 31, 2016 | Dec. 31, 2015 | 2016 | 2015 | 2016 | 2015 |
| IAE International Aero Engines AG, Zürich, Switzerland | 42.3 | 65.4 | 1,169.5 | 899.7 | –1,061.0 | –919.3 |
| MTU Turbomeca Rolls-Royce GmbH, Hallbergmoos | 0.3 | 0.4 | 4.1 | 4.5 | –0.4 | |
| MTU Versicherungsvermittlungs- und Wirtschaftsdienst GmbH, Munich | | | | | –8.6 | –8.6 |
| MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China | 13.1 | | 7.7 | | –123.9 | |
| Airfoil Services Sdn. Bhd., Kota Damansara, Malaysia | 0.7 | 1.0 | 0.1 | 0.2 | –7.5 | –6.8 |
| **Total** | **56.4** | **66.8** | **1,181.4** | **904.4** | **–1,201.4** | **–934.7** |

**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, 2016, 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, 2016 | Equity in 000 € Dec. 31, 2016 | Profit / loss in 000 € 2016 |
|---|---|---|---|---|
| **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 | 27,543[3] | 4,758[4] |
| MTU Maintenance Canada Ltd., Richmond, Canada | Full | 100.00 | 49,894[3] | 15,664[4] |
| Vericor Power Systems LLC., Alpharetta, USA | Full | 100.00 | 43,562[3] | 9,406[4] |
| MTU Aero Engines Polska Sp. z o.o., Rzeszów, Poland | Full | 100.00 | 117,545[3] | –6,162[4] |
| MTU Versicherungsvermittlungs- und Wirtschaftsdienst GmbH, Munich | at cost | 100.00 | 26 | [2] |
| MTU München Unterstützungskasse GmbH, Munich, (in liquidation) | [9] | 100.00 | 25 | 0 |
| MTU Maintenance Service Centre Ayutthaya Ltd., Ayutthaya, Thailand | at cost | 100.00 | 88[1,5] | –55[1,6] |
| MTU Maintenance Dallas Inc., Grapevine, USA | at cost | 100.00 | –745[3] | –285[4] |
| MTU Maintenance IGT Service do Brasil Ltda., São Paulo, Brazil | at cost | 100.00 | 128[1,5] | –26[1,6] |
| MTU Maintenance Lease Services B.V., Amsterdam, Netherlands | Full | 80.00 | 1,208 | 2,105 |
| MTU Aero Engines Finance Netherlands B.V., Amsterdam, Netherlands | at cost | 100.00 | 25[1] | 0[1] |
| MTU Maintenance Service Centre Australia Pty. Ltd., Perth, Australia | at cost | 100.00 | 379[1,5] | –5[1,6] |
| MTU Aero Engines Shanghai Ltd., Shanghai, China | at cost | 100.00 | 125[3] | 12[4] |
| **II. Investments in associated companies** | | | | |
| IAE International Aero Engines AG, Zürich, Switzerland | at equity | 25.25 | 75,865[1,5] | 3,839[1,6] |
| IAE International Aero Engines LLC., East Hartford, USA [10] | at equity | 18.00 | 3,134[3] | 2,159[4] |
| PW 1100G-JM Engine Leasing LLC., East Hartford, USA | at equity | 18.00 | 150,585[3] | 2,567[4] |
| **III. Equity investments in joint ventures** | | | | |
| MTU Maintenance Zhuhai Co. Ltd., Zhuhai, China | at equity | 50.00 | 207,028[3] | 44,398[4] |
| MTU Maintenance Hongkong Ltd., Hongkong, China [8] | at cost | 50.00 | –2[3] | –35[4] |
| Pratt & Whitney Canada Customer Service Centre Europe GmbH, Ludwigsfelde [8] | at equity | 50.00 | 15,935 | 4,171 |
| Ceramic Coating Center S.A.S., Paris, France | at equity | 50.00 | 6,119 | 634 |
| Airfoil Services Sdn. Bhd., Kota Damansara, Malaysia | at equity | 50.00 | 27,457[3] | 6,758[4] |
| AES Aerospace Embedded Solutions GmbH, Munich | at equity | 50.00 | 3,524 | 424 |
| Turbo Union Ltd., Bristol, England | at cost | 39.98 | 284[1] | –6[1] |
| EUROJET Turbo GmbH, Hallbergmoos | at cost | 33.00 | 2,999[1] | 1,913[1] |
| EPI Europrop International GmbH, Munich | at cost | 28.00 | 618[1] | 546[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 | 55,493[1,5] | 258[1,6] |

1) Data for previous year, actuals not yet available
2) Profit / loss according to German GAAP transferred 2016
3) Translated at closing exchange rate Dec. 31, 2016
4) Translated at annual average exchange rate for 2016
5) Translated at closing exchange rate Dec. 31, 2015
6) Translated at annual average exchange rate for 2015
7) - Full = fully consolidated
- at cost = measured at cost of acquisition, because fair value cannot be reliably determined
- 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, 2016, the Executive Board of MTU Aero Engines AG, Munich, comprised the following members:

Members of the Executive Board

| | |
|---|---|
| **Reiner Winkler**<br>Chief Executive Officer | Munich |
| **Dr. Rainer Martens**<br>Chief Operating Officer | Munich |
| **Michael Schreyögg**<br>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 € 7.9 million (2015: € 6.8 million) in the financial year 2016 for their services as board members. This total amount can be broken down into the following components:

Executive Board compensation

| | 2016 | | 2015 | |
|---|---|---|---|---|
| | in € million[1] | in % | in € million[1] | in % |
| **Short-term employee benefits** | | | | |
| Non-performance-related components | 1.8 | | 1.9 | |
| Performance-related components without long-term incentive effect[2] | 1.8 | | 1.1 | |
| Performance-related components with long-term incentive effect[3/4] | 3.8 | | 1.4 | |
| **Total** | **7.4** | **93.7** | **4.4** | **64.7** |
| **Post-employment benefits** | | | | |
| Service cost / past service cost | 0.5 | | 0.7 | |
| **Total** | **0.5** | **6.3** | **0.7** | **10.3** |
| **Share-based payment benefits** | | | | |
| Performance-related components with long-term incentive effect[5] | | | 1.1 | |
| Other [6] | | | 0.6 | |
| **Total** | | | **1.7** | **25.0** |
| **Total compensation** | **7.9** | **100.0** | **6.8** | **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 annual performance bonus (APB) for the financial year 2016; will be paid in 2017.

3) 2nd deferred portion of APB for the financial year 2014 will be paid in 2017.

4) 1st deferred portion of APB for the financial year 2015 will be paid in 2017.

5) Fair value at the grant date.

6) Amounts correspond to differences between cash settlement values and cumulated fair value at the grant date if the redeemed share-based payment benefits. In view of the transition to the new system of long-term compensation as of the financial year 2016, granted performance shares (tranches 2013 to 2015) as well as entitlements granted under Share Matching Plan (tranches 2010 to 2015) have been converted at fair value in the financial year 2016 into restricted shares (2-year vesting period).

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, 2016, the provisions for current and future pension obligations toward former members of the Executive Board amounted to € 8.0 million (2015: € 7.2 million).

**Members of the Supervisory Board**

As in 2015, the members of the Supervisory Board did not receive any additional compensation for supervisory board mandates over and above that received for their supervisory board mandate with MTU Aero Engines AG, Munich. Compensation for active members of the Supervisory Board amounted to € 1.1 million (2015: € 1.1 million).

In the financial year 2016, 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 € 0.6 million (2015: € 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 2016 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.

**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 / adjusted EBIT). 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 € 750.6 million (2015: € 674.4 million) and to segment liabilities of € 409.5 million (2015: € 333.4 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/adjusted EBIT) 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

Lufthansa Technik and MTU are planning to create a joint venture for the maintenance of geared turbofan engines, in which each partner will hold a 50-percent interest. The two companies signed an agreement to this effect in Berlin on February 20, 2017, after several months of studying the implementation of this joint venture. On condition that the relevant approvals are granted (including that of the competent antitrust authorities), the two parties expect to establish the new joint venture in the second half of 2017. No other 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 IFRS 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 2016 - 2015 | |
|---|---|---|---|---|
| in € million | 2016 | 2015 | in € million | in % |
| **Revenues** | **2,667.2** | **2,645.3** | **21.9** | **0.8** |
| Cost of sales | –2,355.1 | –2,406.6 | 51.5 | 2.1 |
| **Gross profit** | **312.1** | **238.7** | **73.4** | **30.7** |
| Selling costs | –63.4 | –47.9 | –15.5 | –32.4 |
| General administrative expenses | –40.4 | –47.5 | 7.1 | 14.9 |
| Balance of other operating income and expenses | 20.1 | –5.3 | 25.4 | >100 |
| Financial result | 144.7 | 120.7 | 24.0 | 19.9 |
| **Earnings from ordinary operating activities (operating profit)** | **373.1** | **258.7** | **114.4** | **44.2** |
| Tax expense | –101.9 | –63.6 | –38.3 | –60.2 |
| **Net profit for the year** | **271.2** | **195.1** | **76.1** | **39.0** |
| Allocations to other reserves | –135.6 | –97.5 | –38.1 | –39.1 |
| **Net profit available for distribution** | **135.6** | **97.6** | **38.0** | **38.9** |

### Allocation to revenue reserves

In accordance with Section 58 (2) of the German Stock Corporation Act (AktG), a total of € 135.6 million of the 2016 net profit was allocated to other reserves by the Executive Board and the Supervisory Board of MTU Aero Engines AG (2015: € 97.5 million).

### Proposed profit distribution

At the Annual General Meeting on May 4, 2017, the Executive Board and the Supervisory Board of MTU Aero Engines AG, Munich, intend to recommend that a dividend of € 1.90 (2015: € 1.70) per share be distributed for the financial year 2016. On the condition that this proposal is accepted by the Annual General Meeting, the total dividend payment for the 51,356,103 shares entitled to a dividend will amount to € 97.6 million. Based on the quoted share price at the close of 2016 of € 109.80 (2015: € 90.10), this is equivalent to a dividend yield of 1.7% (2015: 1.9%).

Pending approval by the Annual General Meeting, the dividend for the financial year 2016 is to be paid on May 9, 2017.

**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 2016 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 20, 2017

**Reiner Winkler**

Chief Executive Officer

**Dr. Rainer Martens**

Chief Operating Officer

**Michael Schreyögg**

Chief Program Officer

# Audit opinion

We have audited the consolidated financial statements prepared by MTU Aero Engines AG, Munich, comprising the Consolidated Income Statement, the Consolidated Statement of Comprehensive Income, the Consolidated Statement of Financial Position, the Consolidated Statement of Changes in Equity, the Consolidated Cash Flow Statement and the Notes to the Consolidated Financial Statements, together with the combined management report of the Company and the Group ("combined management report") for the fiscal year from January 1, 2016 to December 31, 2016. The preparation of the consolidated financial statements and the combined management report of the Company and the Group in accordance with IFRS as adopted by the EU, and the additional requirements of German commercial law pursuant to Sec. 315a (1) HGB ["Handelsgesetzbuch": "German Commercial Code"] are the responsibility of the parent company's management. Our responsibility is to express an opinion on the consolidated financial statements and on the combined management report of the Company and the Group based on our audit.

We conducted our audit of the consolidated financial statements in accordance with Sec. 317 HGB and German generally accepted standards for the audit of financial statements promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). Those standards require that we plan and perform the audit such that misstatements materially affecting the presentation of the net assets, financial position and results of operations in the consolidated financial statements in accordance with the applicable financial reporting framework and in the combined management report of the Company and the Group are detected with reasonable assurance. Knowledge of the business activities and the economic and legal environment of the Group and expectations as to possible misstatements are taken into account in the determination of audit procedures. The effectiveness of the accounting-related internal control system and the evidence supporting the disclosures in the consolidated financial statements and the combined management report of the Company and the Group are examined primarily on a test basis within the framework of the audit. The audit includes assessing the annual financial statements of those entities included in the consolidation, the determination of entities to be included in the consolidation, the accounting and consolidation principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements and the combined management report of the Company and the Group. We believe that our audit provides a reasonable basis for our opinion.

Our audit has not led to any reservations.

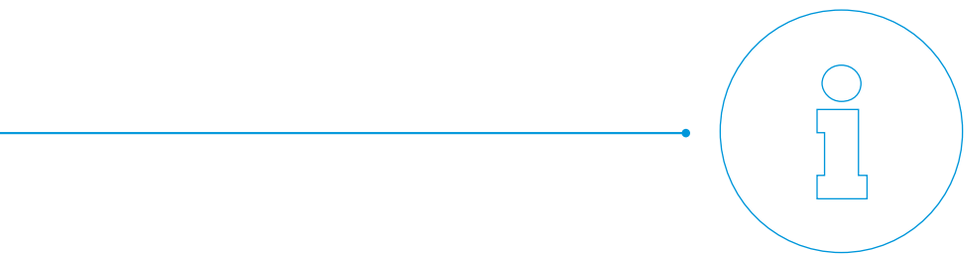
In our opinion, based on the findings of our audit, the consolidated financial statements comply with IFRS as adopted by the EU and the additional requirements of German commercial law pursuant to Sec. 315a (1) HGB and give a true and fair view of the net assets, financial position and results of operations of the Group in accordance with these requirements. The combined management report of the Company and the Group is consistent with the consolidated financial statements, complies with the legal requirements, and as a whole provides a suitable view of the Group's position and suitably presents the opportunities and risks of future development.

Munich, March 1, 2017

Ernst & Young GmbH
Wirtschaftsprüfungsgesellschaft

(Keller)
German Public Auditor

(Westermeier)
German Public Auditor



# Additional information

# Glossary of engine terms

**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 geared turbofan's efficiency 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. Turbofans are far more fuel-efficient than turbojets.

**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-series |
| PW1000G | Airbus A320neo, Bombardier C Series, Mitsubishi Regional Jet, Embraer E-Jets Gen 2, Irkut MS-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** | light-to-medium weight helicopters |

** MRO only*

*** MRO only: over Pratt & Whitney Canada Customer Service Centre Europe GmbH*

## Military engines

| | |
|---|---|
| **Fighter jets** | |
| EJ200 | Eurofighter |
| F110 | Lockheed F-16, Boeing F-15 |
| F414 | Boeing F/A-18 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 |

# Index

# List of charts and illustrations

# Financial calendar

| | |
|---|---|
| April 28, 2017 | Quarterly Statement as at March 31, 2017 |
| | Conference call with analysts and investors |
| May 4, 2017 | Annual General Meeting |
| July 28, 2017 | Interim Report as at June 30, 2017 |
| | Conference calls with journalists, analysts and investors |
| October 26, 2017 | Quarterly Statement as at September 30, 2017 |
| | Conference calls with journalists, analysts and investors |
| December 12, 2017 | MTU Investor and Analyst Day |

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**Translation**
The German version takes precedence.

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