



# MTU Aero Engines

Lifetime Excellence



# The full range of engine expertise



## Firmly established worldwide

MTU Aero Engines is Germany's leading engine manufacturer and a firmly established player in the international aviation industry. The company designs, develops, manufactures, markets and supports commercial and military propulsion systems for aircraft and helicopters, and stationary gas turbines, and offers full system capability in engine construction.

## High power density

MTU offers solutions for the entire engine lifecycle—from development to production to maintenance. With its well-

balanced portfolio, the company is represented in all thrust and power categories for commercial engines. High-pressure compressors, low-pressure turbines and turbine center frames "made by MTU" rank among the best in their class.

In commercial engine maintenance, MTU Maintenance sets global standards with its comprehensive services and innovative repair techniques. MTU Power offers compelling intelligent maintenance solutions for industrial gas turbines. MTU is the industrial lead company for almost all engines operated by the German Armed Forces and plays a key role in major European military engine programs.



# Power for the world



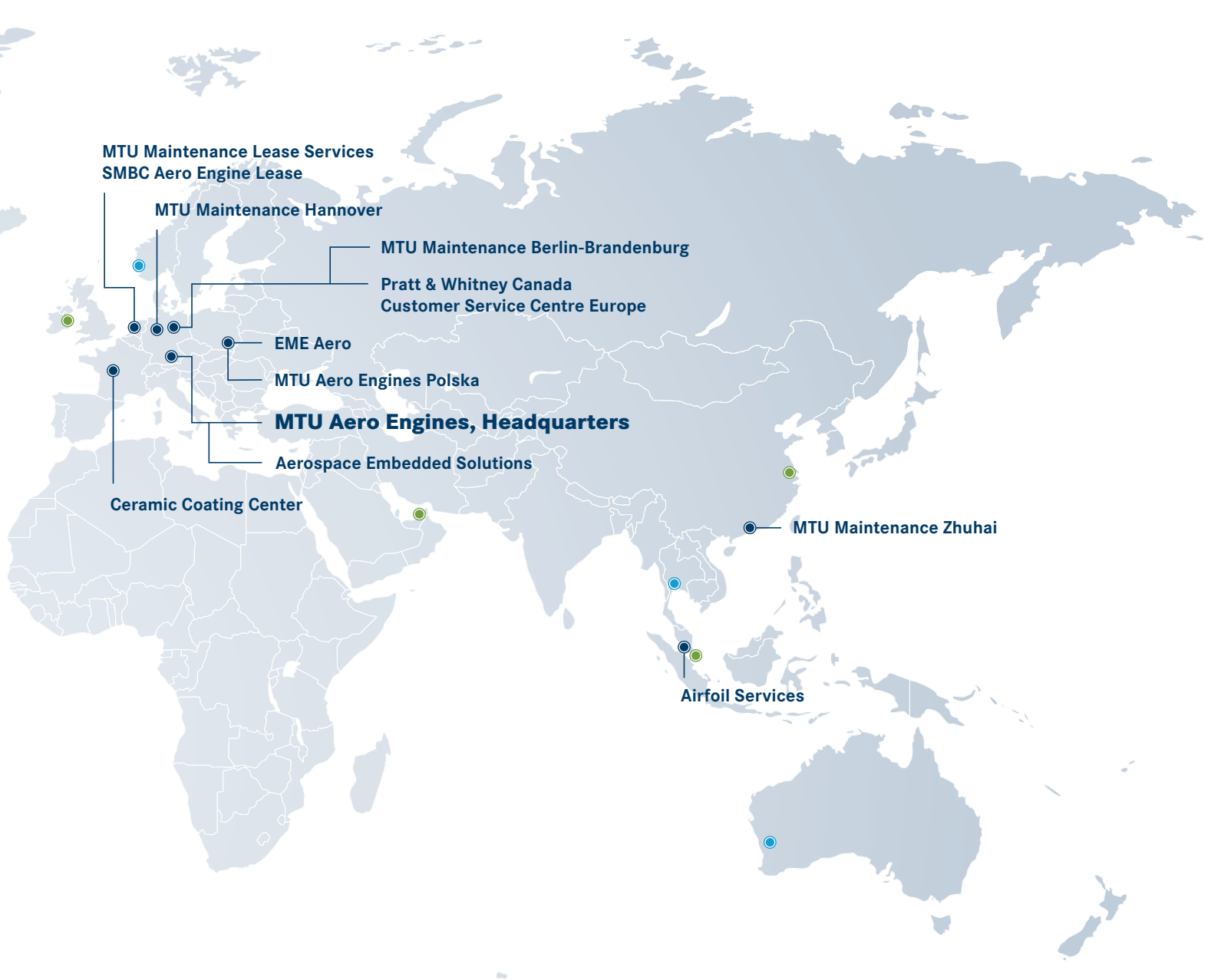
*For MTU Aero Engines, customer proximity is key. This is delivered by around 10,000 employees from over 60 nations at 16 locations worldwide. Through its subsidiaries and joint ventures, MTU is present in all key regions and markets.*

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

## Technological leader

MTU Aero Engines is headquartered in Munich. This facility is the largest of the company's locations. It is from here that the company's affiliates and most of MTU's research and development activities are controlled. As a technology leader, the company is driving forward the development of advanced technologies and engine concepts. Its overarching goal is emissions-free flight. MTU cooperates with all of the big engine manufacturers and partners from research and science.

The company is involved in all major German and European technology programs and provides valuable new impetus with its advanced products, manufacturing and repair techniques. Its innovative power makes it a technology leader that actively shapes the future of aviation as well as a reliable must-have partner.



## Global presence

Germany's leading engine manufacturer operates as a global player. MTU Maintenance ranks among the top three providers of aftermarket services for commercial aircraft engines and can draw on more than 40 years of experience. MTU Power is the first port of call for industrial gas turbine maintenance. MTU is a leader in the field of high-tech repairs developed in-house and comprehensive services covering an engine's entire lifecycle. It has a worldwide network of

locations that guarantees proximity to the customer. With its shops in Europe, Asia and North America, it is a reliable partner for customers everywhere. A network of representative offices, IGT service centers and joint ventures round out MTU's global presence. In addition, its on-site service teams are ready to perform swift repair work worldwide.

# A strong team

## Competent and motivated

What forms the backbone of MTU Aero Engines is its employees. Skilled, highly qualified and motivated, they guarantee top performance and ensure the company's success. Dedicated young professionals work alongside seasoned experts, all invaluable assets to MTU.

putting these standards into practice and developing them in day-to-day operations. To ensure that it can meet demand for highly qualified specialists, MTU relies on an internal system for securing young talent that includes the latest in in-house training, international internships and direct contact with young talent from universities.

## Boost for personal development

Training and development of its employees' professional and personal skills are high on the agenda at MTU. In this way, MTU makes sure its workforce remains highly qualified and internalizes the exacting quality standards stipulated by the company and its partners and customers—

## Flexible and fair

MTU sees itself as a partner to its employees; it acknowledges its responsibility toward them and considers the wider context of its actions. The company's comprehensive offerings include flextime and part-time work schemes, preventive health services, fairness and equal opportunities as well as up-to-date old-age provisions and initiatives to promote work-life balance.





# Assuming responsibility

## Climate impact of aircraft engines

MTU Aero Engines places a great deal of importance on sustainability. Its understanding of responsibility is comprehensive: for the product, its development, manufacture and repair. Particular attention is paid to quality and safety, which are extremely important in the aviation industry. MTU is committed to the goals of the Paris Agreement aimed at limiting global warming to well below two degrees Celsius. In developing future-oriented, eco-efficient engine technologies, the focus is on improving the overall climate impact. That is why, in addition to reducing fuel consumption and thus CO<sub>2</sub> emissions, MTU is increasingly focusing on reducing contrails, cloud formation and noise and exhaust emissions.

## Climate action and environmental protection at our sites

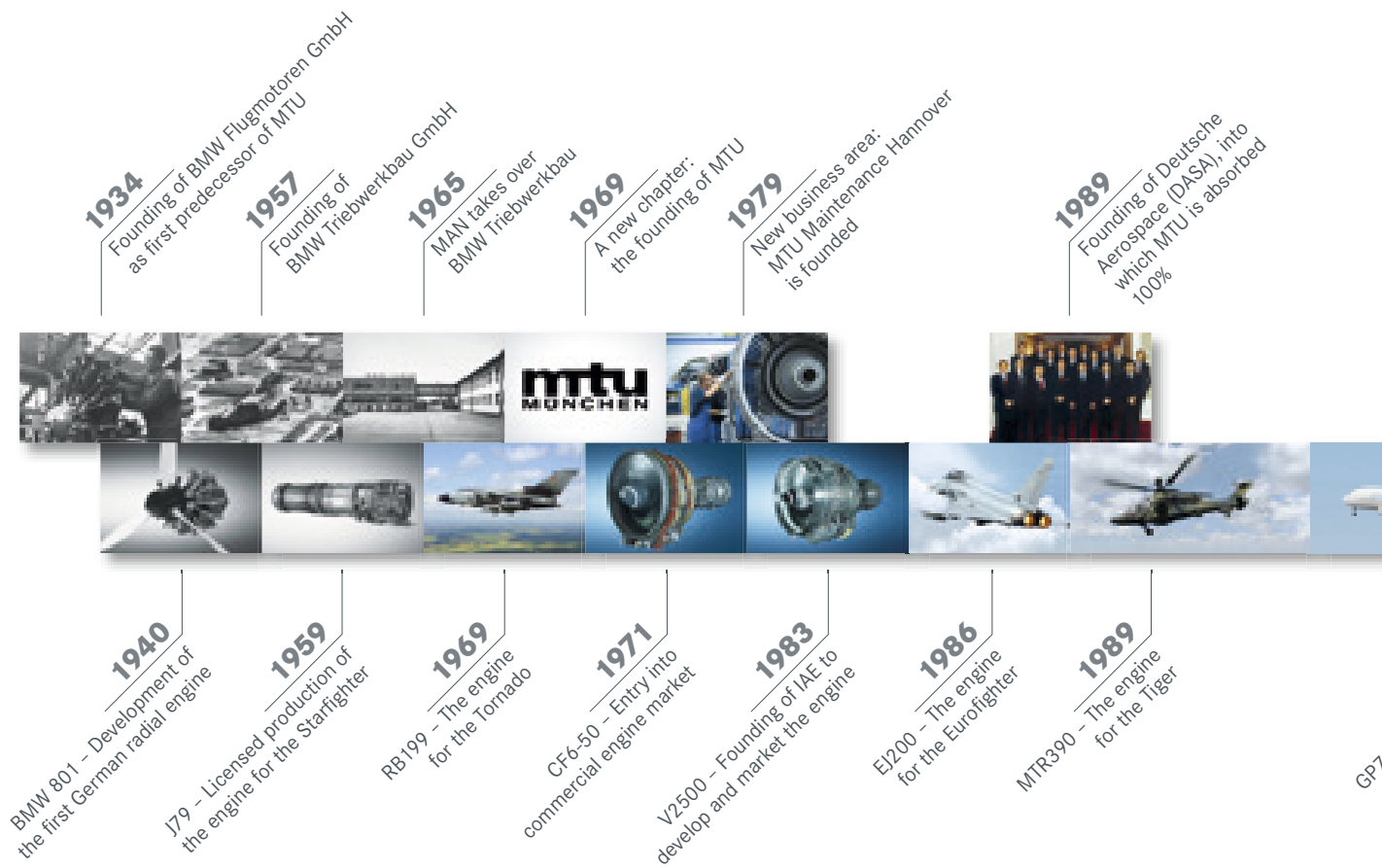
MTU has also defined ecological targets for its manufacturing and maintenance activities, with a focus on climate action. The environmental management system guarantees uniformly high

standards for environmental protection at our sites. Environmental protection and climate action are enshrined in the Code of Conduct applicable to all employees. MTU pursues an integrated approach that incorporates environmental protection and climate action into its business decisions. MTU acts according to the principle of avoid–reduce–offset.

## Corporate Responsibility

MTU bases the implementation of its corporate responsibility in the company on internationally recognized principles. In 2011, it joined the UN Global Compact, the most important international network for corporate responsibility. As a Global Compact signatory, MTU acknowledges its responsibility for protecting the environment, promoting human rights, upholding labor standards and combating corruption. MTU also supports eight of the global Sustainable Development Goals (SDGs) of the UN's 2030 Agenda. It regularly reports on its sustainability activities and progress in its Sustainability Report and its non-financial statement.

# There from the outset



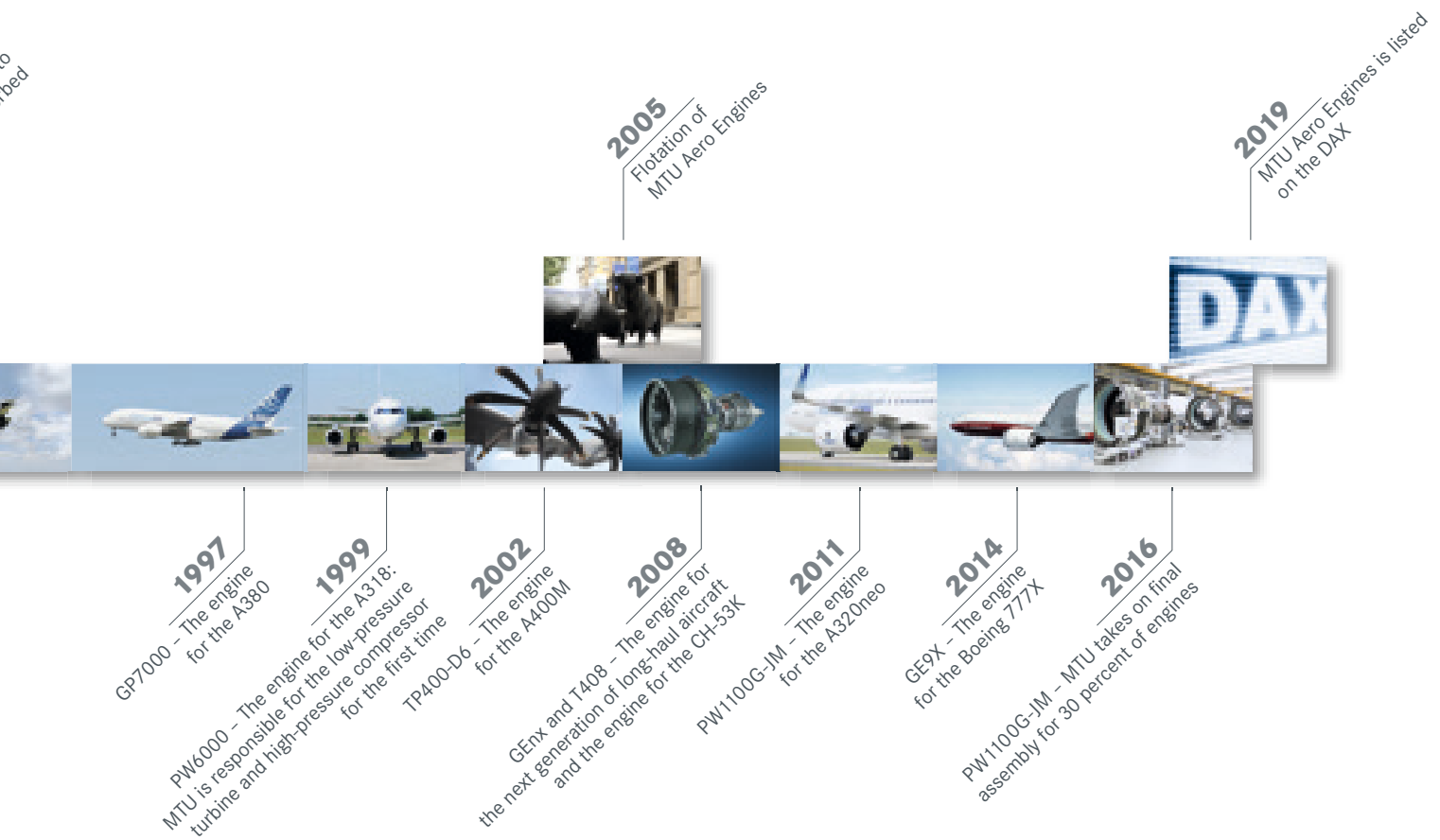
## MTU's roots reach back to the dawn of aviation

MTU Aero Engines is a long-established German company with roots that reach back to the dawn of powered aviation. In 1934, BMW Flugmotoren-bau GmbH was founded at a location to the north of Munich. It is the legal predecessor of today's MTU Aero Engines. The corporate headquarters are still at the same location. In the course of its eventful history, MTU has undergone a number of name changes, with BMW, MAN, Daimler-Benz and DaimlerChrysler as the dominant companies. Since 2005, the engine manufacturer has been an independent company listed on the stock exchange. In September 2019, MTU was promoted to the DAX. Over the past decades, MTU has repeatedly set technological benchmarks to drive forward the development of aviation. This

has enabled it to acquire unique expertise over the years. What was once a national company has developed into an international high-tech group that will continue to play a major role in shaping aviation in the future.



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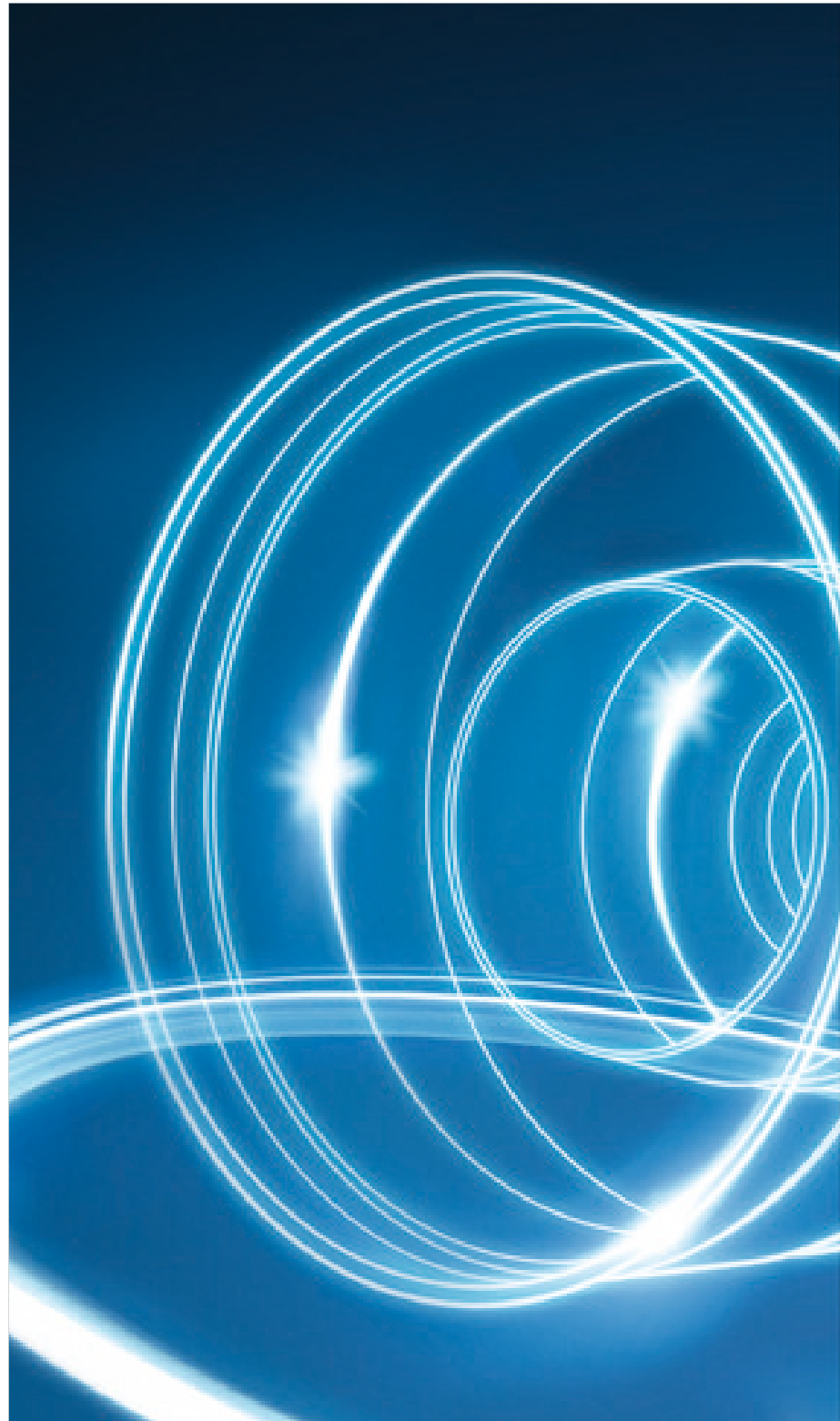


## Development milestones

MTU's history is inextricably linked with the RB199 engine for the Tornado fighter jet. In 1969, the company participated in the development of this engine and thus in one of the most successful engine programs in its history. In the 1970s, MTU moved into the commercial engine business with the CF6-50—with General Electric as its partner. This engine powered the Airbus A300 and was adapted for numerous other applications. As commercial aviation really began to take off in the 1970s, MTU entered the engine maintenance business, founding MTU Maintenance Hannover in 1979. In the 1980s, MTU advanced to become the global player it is today. Together with Pratt & Whitney (P&W), Rolls-Royce, what was FiatAvio, and Japanese

Aero Engines Corporation, it founded International Aero Engines (IAE)—and the jointly developed V2500 for short- and medium-haul jets became a bestseller for decades. Featuring most prominently in its commercial product range today is the geared turbofan. This game-changing propulsion concept is developed and built jointly by Pratt & Whitney and MTU: what sets the new family of engines apart is their very low fuel consumption and low levels of noise and CO<sub>2</sub> emissions. But MTU also remains a firmly established player in the military business, with shares in the EJ200 engine for the Eurofighter, the MTR390 for the Tiger combat helicopter and the TP400-D6 for the A400M military transport aircraft.

# Full power ahead for innovation



## Key driver

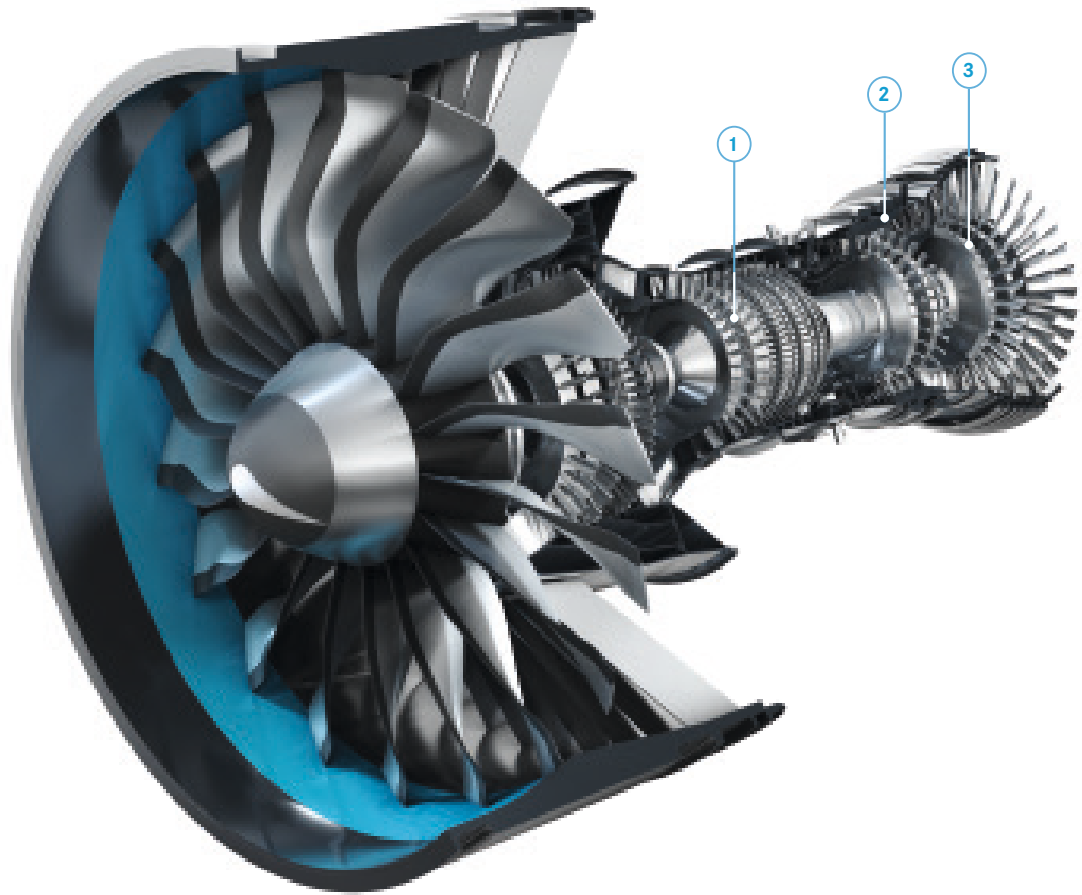
Growing mobility requirements, plus the limited supply of resources and worsening ecological problems, leave little doubt that technological solutions in the aviation industry must go beyond existing concepts. Commercial aircraft and engines must become even cleaner, quieter and more fuel-efficient—the ultimate aim being emissions-free flight—and military aircraft and engines even more powerful. Getting there calls for innovative technologies. Never has MTU had such pioneering solutions for the aviation of tomorrow and beyond. As such, it remains a key driver of innovation.

## Cleaner, quieter, more efficient: the GTF™ Engine Family

Through its workshare in the Pratt & Whitney GTF™ Engine Family, MTU has helped determine the course of aviation in today's world: this newly developed engine architecture substantially reduces fuel consumption and carbon dioxide emissions and significantly decreases noise footprint. MTU is hard at work on further improvements: it aims to achieve additional ambitious reductions in all emissions by optimizing this technology and combining it with revolutionary propulsion concepts. Powering the GTF with alternative fuels improves its carbon footprint even further.



# Cutting-edge technology



MTU's strength is its comprehensive understanding of engines and systems. The company's focus is on its three core components—high-pressure compressors, low-pressure turbines and turbine center frames—and its unique manufacturing and repair processes.

① High-pressure compressor



② Turbine center frame



③ Low-pressure turbine



## Manufacturing



## Maintenance



## Through its innovative strength, MTU has established itself as a leader in essential engine technologies

### **Development and manufacturing**

For decades, MTU has taken an active role in numerous engine development programs. Its know-how gives it unique expertise in the new and further development of advanced components as well as in new evolutionary and revolutionary propulsion concepts. The company secures its technological edge and commercial success over the long term through its committed, dedicated research and development work as part of strong innovative and technology processes. It successfully launches new products and services on the market with shorter and shorter lead times. Aircraft engines are high-tech products that require innovative manufacturing processes. MTU pursues the full spectrum of activities, ranging from process development and new testing and measuring methods to automation and production and maintenance planning. In doing so, it increasingly relies on digitalization—in all areas. Additive processes

are playing an ever more important role. MTU intends to fully exploit the advantages of this technology—including substantially greater design freedom, shorter development and production cycles, and lower costs. Another focus for development at MTU is on novel, robust materials that save weight and are heat-resistant.

### **Maintenance**

In the field of commercial engine and industrial gas turbine maintenance, MTU has established itself as the world's leading provider of innovative, tailored aftermarket services. With its unique high-tech repairs developed in-house, it achieves unparalleled levels of restoration and long on-wing times. Another strength is predictive maintenance: Engine Trend Monitoring allows airlines to digitally monitor the condition of their engines. All in the spirit of efficiency through advance knowledge.

## Engine components “made by MTU” are some of the best the global market has to offer

### **Efficient compressors**

MTU's compressors are second to none. Today's compressors are predominantly built on the blisk principle, where the disk and blades are manufactured as a single part. The advantages are greater tensile strength, lower weight, enhanced aerodynamic characteristics, no wear and tear, and no assembly costs. The high-pressure compressor developed in partnership with Pratt & Whitney is the core component of the innovative GTF™ Engine Family, which powers regional and business jets as well as short- to medium-haul airliners.

### **Award-winning turbines**

When it comes to low-pressure turbines that operate at maximum efficiency, MTU is the world's technology leader. The breadth of its expertise is enormous, ranging from conventional models for business jet engines and power turbines for heavy-lift helicopters all the way to large conventional low-pressure turbines for turbofan engines powering medium- and long-haul airliners. MTU's masterpiece is the high-speed low-pressure turbine, a key component of the GTF, and a one-of-a-kind technology that delivers unparalleled efficiency.

### **Turbine center frame**

For engines in the upper thrust category, MTU manufactures turbine center frames. In operation, these sophisticated components are exposed to extreme stresses—high mechanical loads, plus high temperatures. The material and design must therefore satisfy the highest of standards. This in turn requires manufacturing technology at its best.

### **Systems expertise**

Engine control and monitoring systems are playing an increasingly important role in modern engines to ensure safety and efficiency. MTU has more than 40 years' experience with engine control systems thanks to its work developing military powerplants. The company's product portfolio includes the complete control and monitoring system, electronic and hydraulic subsystems and equipment, plus the associated software.

# One step ahead

Through its committed, dedicated research and development work, MTU secures its technological edge and commercial success over the long term.

## **The future of aviation**

Germany's leading engine manufacturer is shaping the future of aviation, acting early to define pioneering development trends and technology requirements. At the same time, it is working simultaneously on new commercial and military products for tomorrow and on revolutionary propulsion systems that will achieve the targets set for further into the future. Key technologies required to optimize MTU's components include new, lightweight high-temperature materials, additive manufacturing techniques, and virtual design and production.

## **Technology roadmap**

MTU's Leading Technology Roadmap charts the company's path for the future. The roadmap pursues two main objectives. The first of these is the evolutionary development of the gas turbine based on the geared turbofan, combined with revolutionary propulsion concepts that greatly improve the cycle and substantially reduce all emissions. MTU favors the Water-Enhanced Turbofan (WET engine). This concept delivers a significant reduction in all emissions, especially NOx from wet combustion, and goes a long way to suppressing the formation of contrails. The

technology can certainly be accelerated and—if its performance can be successfully demonstrated—could go into large-scale production before 2040. The second main objective is to electrify the powertrain as far as possible to minimize in-flight emissions. Of all the concepts MTU has examined here, it has set its sights on fuel-cell technology, which converts hydrogen into electricity. MTU's fuel-cell concept is called the Flying Fuel Cell.

## **Sustainable alternative fuels**

MTU is also focusing on alternative fuels known as drop-in sustainable aviation fuels (SAFs), which can be used at once and are absolutely essential in efforts to reach ambitious climate goals. Because they can be dropped into the existing fleet, they would immediately help reduce its climate impact. MTU favors synthetic kerosene produced from renewable electricity or sunlight and is actively advocating its development.

In the long term, hydrogen is the MTU's fuel of the future across three applications: it can be burned directly in the gas turbine, converted into SAF, or converted into electrical energy using a fuel cell.

MTU works with partners from industry and science to develop advanced technologies that make engines even more environmentally sustainable

## **Technology funding programs**

At both the national and European levels, MTU participates in all major research projects. It plays a crucial role in the German government's LuFo aeronautics research program, in technology development for the German Federal Ministry of Defence (BMVg) and in EU research programs such as Clean Sky. The strength of MTU's networks with industrial partners and the research community, as well as sustained funding from the public sector at the national and European levels, are key pillars for the successful development of new technologies.

## **Technology network**

Progress requires unconventional ideas and regular injections of fresh momentum. This is why MTU works closely with universities and research institutions. Its network strategy relies on three pillars: trend analysis and development of visionary engine concepts at the Bauhaus Luftfahrt think tank; concentration of basic research at just a few top-notch institutes and universities; and regular exchange of experience with experts within and outside the aviation industry.



# MTU 4.0

## The company sees digitalization as the way forward—from development to production to maintenance

MTU Aero Engines lives and breathes digitalization in all business areas. The long-term goal is to intelligently connect the various steps of the entire value chain and map them virtually as well. Data analysis and artificial intelligence enable major improvements to numerous processes in development, manufacturing / quality assurance and MRO. Step by step, the company is being transformed into MTU 4.0, Germany's leading engine manufacturer in the digital age.

### Technology 4.0

Even in the digital age, real aircraft will be powered by real engines. However, engine development is shifting increasingly to the digital world. Today, MTU already uses comprehensive simulations across the complete process chain. This approach significantly speeds up the time it takes to design, develop and manufacture an engine and then bring it to market, because in part it replaces cost-intensive and time-consuming tasks such as building test platforms, prototyping and validation testing. Instead, digital models are created and simulation is pushed further and further.

### Supply Chain 4.0

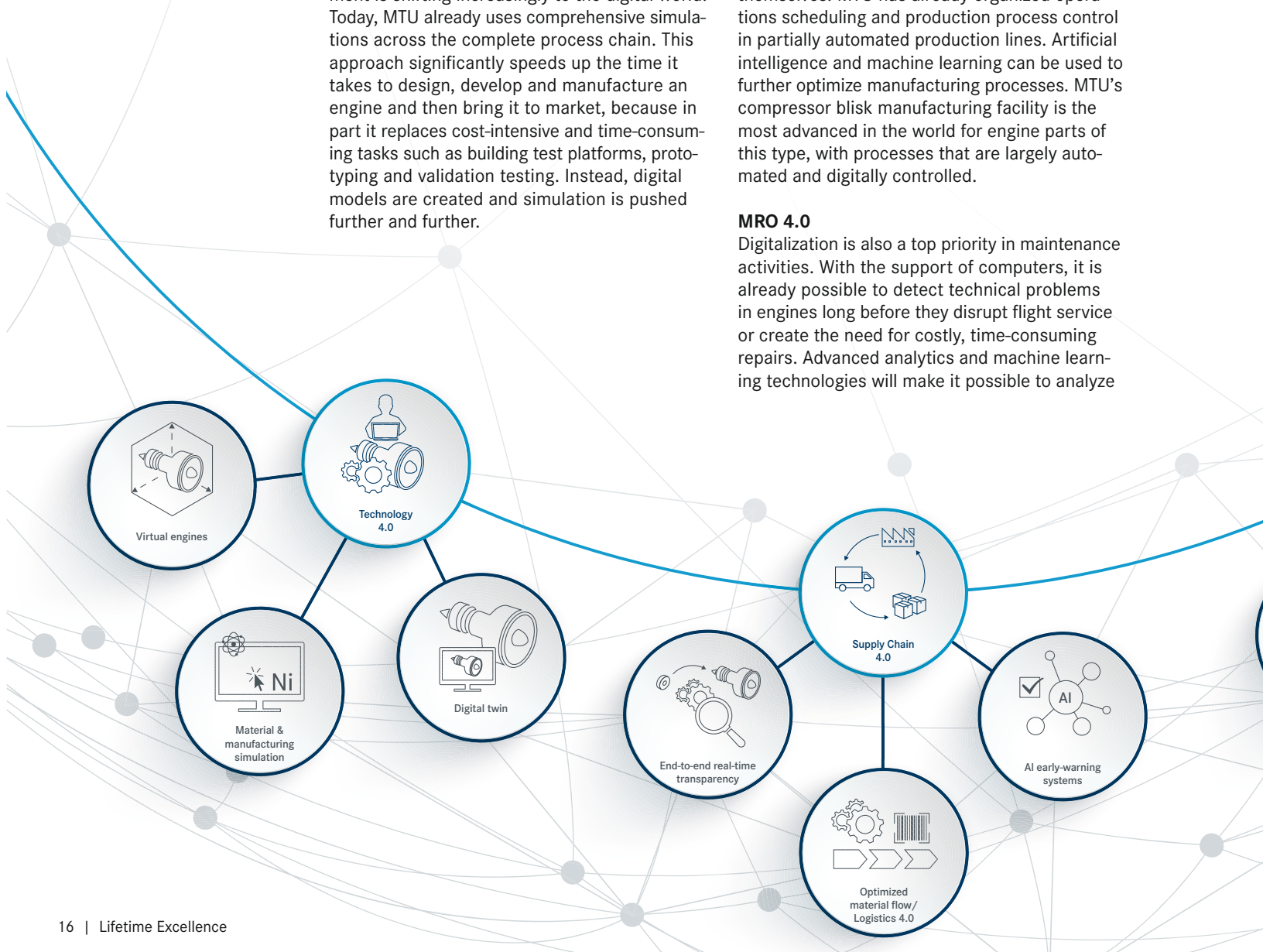
Complete transparency along the entire value chain is intended to help secure deliveries, minimize inventories and show production progress at any point in time. The aim is to be able to evaluate disruptions in the supply chain in real time and optimize responses by way of extensive systems connectivity with suppliers and customers.

### Manufacturing 4.0

In advanced manufacturing, products and the means of production are able to communicate and flexibly connect with each other. Cyber-physical systems enable components to identify themselves. MTU has already organized operations scheduling and production process control in partially automated production lines. Artificial intelligence and machine learning can be used to further optimize manufacturing processes. MTU's compressor blisk manufacturing facility is the most advanced in the world for engine parts of this type, with processes that are largely automated and digitally controlled.

### MRO 4.0

Digitalization is also a top priority in maintenance activities. With the support of computers, it is already possible to detect technical problems in engines long before they disrupt flight service or create the need for costly, time-consuming repairs. Advanced analytics and machine learning technologies will make it possible to analyze

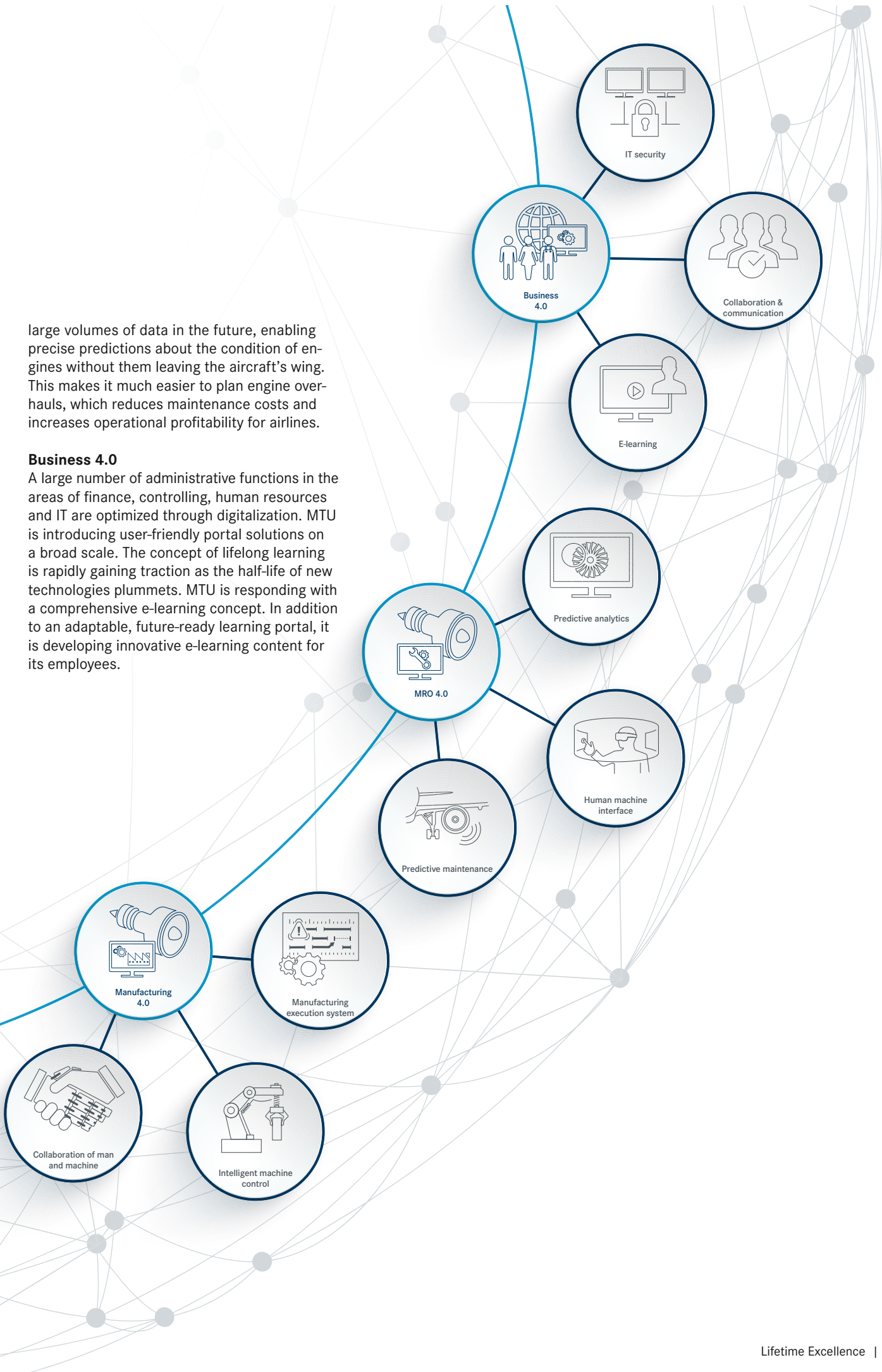




large volumes of data in the future, enabling precise predictions about the condition of engines without them leaving the aircraft's wing. This makes it much easier to plan engine overhauls, which reduces maintenance costs and increases operational profitability for airlines.

**Business 4.0**

A large number of administrative functions in the areas of finance, controlling, human resources and IT are optimized through digitalization. MTU is introducing user-friendly portal solutions on a broad scale. The concept of lifelong learning is rapidly gaining traction as the half-life of new technologies plummets. MTU is responding with a comprehensive e-learning concept. In addition to an adaptable, future-ready learning portal, it is developing innovative e-learning content for its employees.





# Indispensable partner

## Partnerships are a key prerequisite for MTU's long-term success

Thanks to its innovative strength and technological prowess, it has established itself as an indispensable partner in the industry. The company is part of a strong network with numerous collaborations at the highest level—from research collaborations to strategic partnerships.

### **Research and development**

MTU's research and development activities are based on close cooperation with institutes and universities. It intensified its collaboration with leading German universities by establishing centers of competence. Together with partners, MTU has also established the Bauhaus Luftfahrt think tank to research both technological and economic aspects of future air transport.

### **Manufacturing**

Collaboration based on partnership also plays an important role in MTU's dealings with suppliers. Suppliers provide MTU with first-class materials, machinery, products and repairs, without which high-tech engine manufacturing and maintenance would be unthinkable. Around 6,300 suppliers supply MTU locations worldwide.

### **Programs**

In its commercial engine programs, MTU cooperates worldwide with industry giants such as GE Aviation and Pratt & Whitney. As the world's largest subsystem supplier, it successfully contributes its unique capabilities and experience to these ventures. In its military programs, MTU



works at the European level with all the industry's leading partners. It is the cooperation partner for all major engines flown by the German Armed Forces as well as a partner in U.S. military programs.

**Service**

Top quality and top performance—that's what MTU and its partners stand for when it comes to first-class service. MTU maintains successful joint ventures in these areas, for example with China Southern Airlines in maintenance, with Lufthansa Technik in airfoil repair, and with the Japanese Sumitomo Corporation in engine leasing. It is also a reliable partner to original equipment manufacturers (OEMs) in the global MRO

network for the Pratt & Whitney GTF™ Engine Family. MTU and Lufthansa Technik established their EME Aero joint venture in Poland to repair these innovative engines. Further important partners in commercial maintenance are the airlines that place their trust in MTU Maintenance's services. In military maintenance, MTU cooperates closely with the German Armed Forces.

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Expertise

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# All-around competence



## Top performance in all business areas

Fully 30 percent of aircraft fly with MTU technology on board. Today, MTU Aero Engines is a major player worldwide both in the commercial OEM business and in maintenance.

In the commercial MRO sector, it is a leader with its comprehensive range of engine services. Around 1,000 shop visits a year for 30 engine types, a worldwide service network, proprietary high-tech repairs and the highest quality standards demonstrate MTU Maintenance's particular strength.

For more than 85 years now, the military business has formed the basis for MTU's system capabilities. MTU is the leading industrial company for the German Armed Forces and plays a key role in major European military engine programs. It has acquired workshares in programs for the U.S. military as well.

With its engine expertise, MTU also ensures first-class performance in the maintenance of industrial gas turbines (IGTs). MTU Power is one of the world's leading providers of reliable, flexible and cost-efficient solutions for General Electric's LM™ series IGTs.



MAINTENANCE

RESEARCH &  
DEVELOPMENT

SERIES PRODUCTION



# Commercial powerhouse

## Balanced portfolio of products and services

MTU has a hand in 30 percent of the world's commercial aircraft fleet. Demand for engines will be here for the long term. MTU Aero Engines is ideally positioned in this respect, thanks to its well-balanced portfolio of products and services—from powerplants for business jets to the most powerful engines for widebody aircraft—and to its cutting-edge technologies.

## Successful collaborations

With its sophisticated high-pressure compressor, low-pressure turbine and turbine center frame components, MTU has established itself as an indispensable partner to industry giants GE Aviation and Pratt & Whitney. MTU's cutting-edge technology can be found in virtually all thrust classes; for example, in the Pratt & Whitney GTF™ Engine Family that powers numerous business and medium-haul jets, as well as in long-haul engine programs such as the GEnx for the Boeing 787 Dreamliner or the GE9X for the Boeing 777X. For next generation engines such as the Pratt & Whitney GTF™ Engine Family, MTU's solid partnership with OEMs is increasingly being extended to maintenance.

## New engine technologies set standards

MTU plays a key role in the development of quieter, more efficient engines. The company is collaborating closely with key players in the sector to develop novel propulsion systems and technologies for the future. The best example is the innovative Pratt & Whitney GTF™ Engine Family. MTU systematically refines and optimizes its components on an ongoing basis. To make the engine even more efficient requires an increase in the interior pressures and temperatures. This calls for new materials and coatings. Moreover, integrated structures (produced in a single piece) and new materials hold the key to significant reductions in weight.

Superior engine power:  
MTU's commercial product portfolio covers all thrust classes.

Widebody jets



Narrowbody and regional jets



Business jets



From the most powerful engines for widebody aircraft to engines for business jets—MTU is involved in all major programs.

# MRO solutions tailored to customer needs

## Top maintenance provider

MTU Maintenance ranks among the top three providers of aftermarket services. It can draw on more than 40 years of experience and has handled over 20,000 shop visits. It is also a leader in the field of engine MRO services. Through its global service network, the company offers guaranteed customer proximity and has a presence in all important growth regions. Its engine portfolio is broadly diversified and covers the most common aircraft types from business jets to long-haul aircraft.

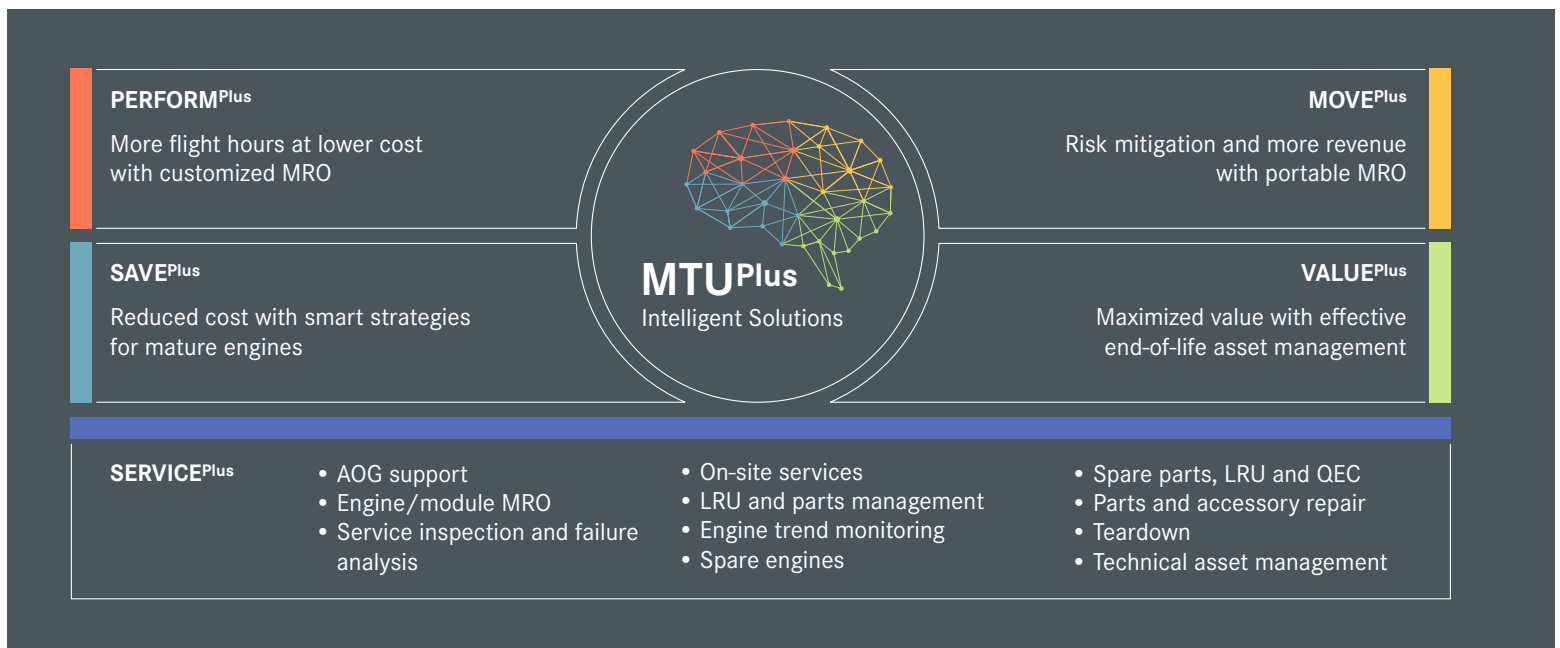
## Services that meet the highest standards

With PERFORM<sup>Plus</sup>, MTU Maintenance offers operators of newer engines customer-specific solutions for them to generate more flight hours. The keys to success are fleet management, predictive maintenance with engine trend monitoring as well as high-tech repairs, on-site services and replacement engines. For engines at the end of their lifecycle, the company has developed intelligent SAVE<sup>Plus</sup> strategies that are tailored to the remaining on-wing times and reduce costs.

Toward the end of an aircraft's life, operators want to extract the maximum possible value from their engines. MTU Maintenance offers its customers effective end-of-life asset management with VALUE<sup>Plus</sup>, finding the right solution regardless of the engine type and components. With MOVE<sup>Plus</sup>, customers benefit from transferable MRO concepts, rapid remarketing of engines through simple transfers, and predictable costs. In addition to these integrated service solutions, MTU customers can also rely on tailored services with SERVICE<sup>Plus</sup>.

## Preferred partner of airlines, leasing companies and OEMs

MTU is a reliable partner for more than 1,400 customers. These include around 200 airlines as well as leasing companies and engine manufacturers. Airlines benefit from integrated services over the entire lifecycle of an engine. As a long-term partner in the OEM network, MTU is increasingly supporting OEMs with standardized maintenance solutions—for example in the maintenance of Pratt & Whitney GTF<sup>TM</sup> Engine. Moreover, its expertise in maintenance makes MTU airlines' preferred joint venture partner worldwide.









# Committed to the mission

## A key role in major military engine programs

MTU Aero Engines is one of the world's leading industrial system partners for the military engines that power combat jets, helicopters and military transport aircraft. With its first-class technologies, products and services, MTU ensures that customers can count on the full availability of their fleets at all times.

The company is the leading industrial company for engines operated by the German Armed Forces and plays a key role in major European military engine programs—such as the EJ200 for the Eurofighter, the TP400-D6 for the A400M and the MTR390 for the Tiger. It is also involved in non-European programs. With its workshare in the T408 engine for the CH-53K, the company has in cooperation with GE Aviation taken full development responsibility for components in a U.S. military program for the first time in its history.

MTU will work together with Safran and ITP to develop, manufacture and support the engine that will power Europe's Next Generation Fighter. This engine, known as the Next European Fighter Engine, will shape Europe's military engine business for decades to come.

## Full systems expertise

MTU Aero Engines is Germany's industrial lead company for practically all engines operated by the country's military. Alongside the development and manufacture of innovative engine modules and components, MTU offers the best in maintenance, repair and overhaul solutions and a comprehensive range of additional engine services. It works in close collaboration with the customer to develop and implement tailor-made service support concepts. MTU's comprehensive support services throughout an engine's lifecycle enable partners such as the German Armed Forces to secure valuable know-how.

## Collaboration with the German Armed Forces

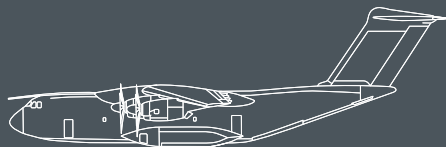
In 2002, MTU became the first company in the market to successfully establish a cooperation arrangement with its largest military customer, the German Armed Forces. MTU experts and specialists from the German Air Force work shoulder to shoulder to maintain the military's EJ200, RB199 and MTR390 engines. MTU is also the first certified company to maintain the TP400-D6 engine based on commercial MRO procedures.

MTU has been a strong partner in military programs both in Germany and on an international level for decades.

Fighter aircraft



Transport aircraft



Helicopters



MTU's expertise can be found in military engines used to power fighter aircraft, military transport aircraft and helicopters.

# Power for industrial gas turbines

## Technological expertise in maintenance

Under its MTU Power brand, MTU is one of the world's leading providers of reliable, flexible and cost-efficient maintenance solutions for General Electric's LM™ series industrial gas turbines (IGTs). MTU's experts can look back on more than 40 years of experience and around 1,500 shop visits. Its international customers are as diverse as the range of applications for the products: power generators, navies, oil platform operators and compressor stations. They all benefit from a worldwide service network and MTU's expertise in the development, manufacture and repair of closely related aircraft engines.

## The best solution for every customer

MTU's Berlin-Brandenburg site is the Center of Excellence for Maintenance, Repair and Overhaul (MRO) of LM™ series IGTs. This location operates one of the largest and most advanced IGT test facilities worldwide. To ensure proximity to the customer, MTU Power is further expanding its network of service centers worldwide. It is now represented in Australia, Brazil, Norway, Thailand and the United States. MTU Power offers compelling customer-specific service solutions—from individual on-site repairs to comprehensive services from a single source—including lease engines and IGT package services.

## OEM for marine and industrial gas turbines

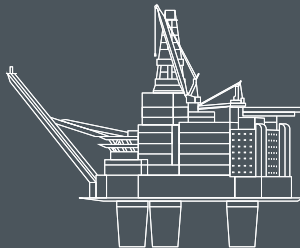
The MTU subsidiary Vericor Power Systems LLC in Alpharetta, United States designs, develops and manufactures TF and ASE series gas turbines for marine propulsion, mechanical drive and electrical power generation applications. It also offers comprehensive services for these power units. The company supplies customers all over the world, including naval forces such as the U.S. Navy.

Global operations: MTU Power serves its customers around the clock, 365 days a year.

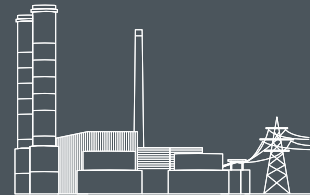
High-performance ship



Oil and gas rig



Power station



Whether supporting marine engines, compressor stations or power generators—MTU observes stringent quality criteria in IGT maintenance, comparable with the high standards in the aviation industry.







# Lifetime Excellence

With its broad portfolio of products and maintenance services for commercial and military engines, MTU Aero Engines holds a prime position for the future. Partners and customers benefit from MTU's outstanding systems expertise across the entire lifecycle of commercial and military engines—from research and development to manufacturing, maintenance and support including comprehensive services. The objective is to grow profitably and faster than the market. Sustainable growth is based on a future-oriented engine and service portfolio, stable, long-term customer relationships, a motivated workforce, and a global presence in growth markets.

MTU has already secured stakes in major engine programs for next-generation aircraft. MTU's cutting-edge technology can be found in virtually all thrust classes; for example, in the Pratt & Whitney GTF™ Engine Family that powers numerous business and medium-haul jets, as well as in long-haul engine programs such as the GENx for the Boeing 787 Dreamliner or the GE9X for the Boeing 777X. In the military sector, it carved out an excellent position for itself with workshares in the TP400-D6 engine for the A400M military transporter and the T408 engine for the CH-53K heavy-lift helicopter.

Europe's Future Combat Air System (FCAS) forms the backbone of a new defense architecture for the continent. The new fighter jet, the central element of FCAS, is expected to enter service around 2040. MTU will play a central role in developing, manufacturing and supporting the engine for this fighter jet.

In the MRO segment, MTU benefits both from its activities as a strong independent service provider and from its close ties with OEMs in the context of new engine programs in which it has acquired a stake.

With its innovative capabilities, the company has established itself as a technology leader in key fields and comes recommended as a reliable partner in the industry. It invests in a wide range of technological activities, simultaneously working on new products for tomorrow and revolutionary propulsion systems for even further into the future: MTU is one of the few industry players worldwide to formulate concrete commercial propulsion proposals for achieving the ambitious targets from 2050 onward. MTU has the courage and innovative strength to provide answers to the challenges of the future and make the dream of sustainable, emissions-free flight come true.



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