



MTU Aero Engines – Lifetime Excellence

July 2018

Agenda

Our
environment **1**

Our
track record **2**

Our
expertise **3**

Your
questions **4**

46,000 Aircrafts

The globally active fleet of 23,000 aircrafts will double by 2036.



Less than

2 billion
people

out of 7 billion have flown in an
aircraft to date.



Up to **6 million** **components**

A passenger aircraft is made up of up to 6 million components.



In **100** Years

is a pilot once forced to shut down
an engine.

FRAGILE - USE PROTECTIVE PAD
WHEN MOVING IN ALL DIRECTIONS
LIMIT 2 PERSONS AT ONE TIME

2.9 liters of kerosene

fuel consumption per 100
passenger kilometers.



75% of the
noise footprint

is reduced by the
geared turbofan.





**We shape the future
of aviation!**



MTU pursues a sustainable growth strategy in all of its business segments - based on stable and long-term customer relationships

Balanced portfolio



Leading technology

Benchmark competitiveness



Innovative culture





Our track record

Partners and customers appreciate MTU's excellence.

MTU looks back on many important names from the German industrial history – from 1934 to date

1934

BMW Flugmotorenbau GmbH is founded



1965

MAN takes over BMW Triebwerkbau

1969

MTU
50% Daimler Benz
50% MAN



1989

MTU becomes an affiliate of Deutsche Aerospace, later renamed DaimlerChrysler Aerospace (DASA)

2005

MTU goes public



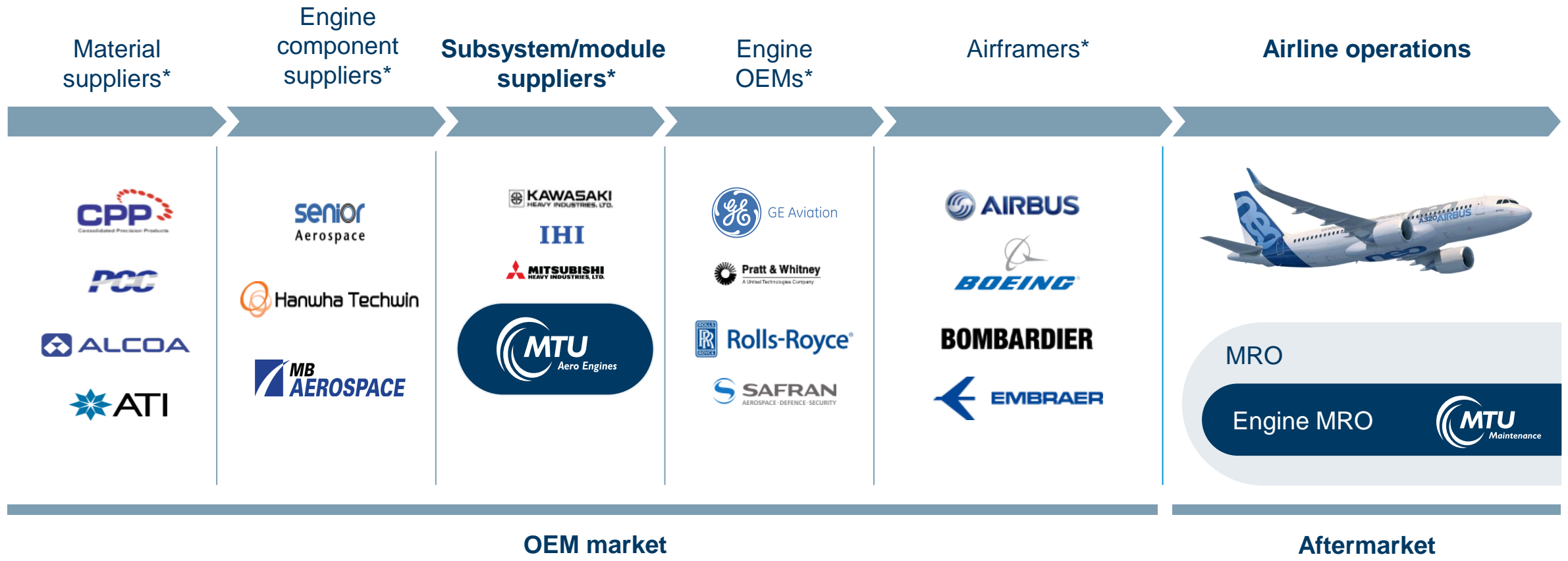
Today

Shareholder structure
93% Institutional investors
6% Private shareholders
1% MTU-owned shares

Focus on **military** applications

Focus on **commercial** applications

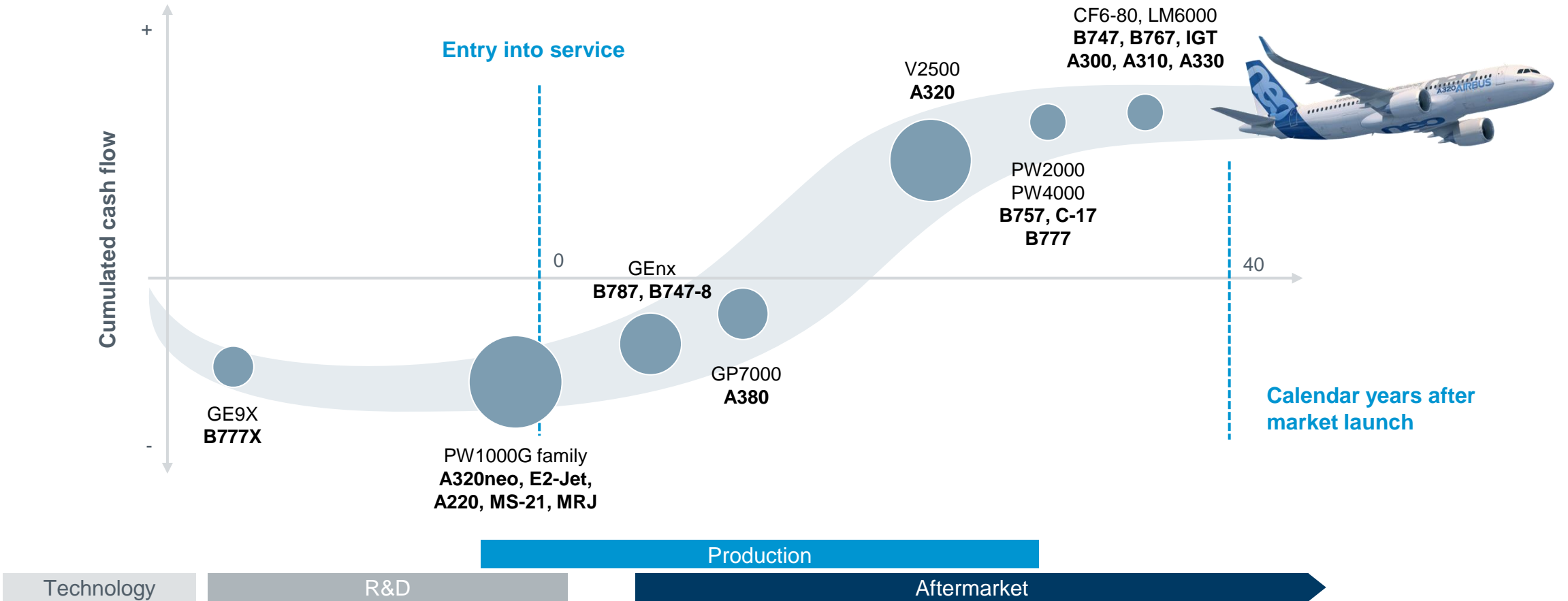
MTU is an essential partner in the engine value chain



*selected market participants

A balanced portfolio and products in all thrust categories ensure MTU's long-term success

Return on investment periods in the commercial OEM business



Our track record: partners and customers appreciate MTU's excellence

Commercial OEM business



Military OEM business



Commercial MRO business



Our track record: partners and customers appreciate MTU's excellence

Commercial OEM business

- Revenues: € 2.5 billion (48%)*
- Decades of partnerships with OEMs
- Balanced product portfolio in all thrust categories
- Order volume secures business into the next decade
- Partnerships with OEMs increasingly include maintenance

OEM

Revenues	EBIT adj.
€ 2.9 billion*	€ 0.4 billion*

Military OEM business

- Revenues: € 0.4 billion (8%)*
- European and U.S. engine programs
- Full system capability
- Leading partner of the German Armed Forces
- Service packages precisely tailored to the requirements of military partners

Commercial MRO business

- Revenues: € 2.3 billion (44%)*
- Services: maintenance, leasing and asset management
- Global network
- Direct customer business, partner of OEMs and airlines
- 18,000 shop visits in 36+ years
- More than 1,400 customers, including over 200 airlines

MRO

Revenues	EBIT adj.
€ 2.3 billion*	€ 0.2 billion*

* Basis: Fiscal 2017

Our track record: partners and customers appreciate MTU's excellence

Commercial OEM business



Military OEM business



Commercial MRO business



In the commercial OEM business, 30% of today's aircraft have MTU technology on board and MTU is growing faster than the market as a whole

Commercial OEM business

Business jets



Revenues will **triple** in 10 years

Regional jets



Market share will **increase** from 0% to 90%

Narrowbodies



Excellent market position will **further improve**

Widebodies



New market segments have **opened up**

Above-average growth

Our track record: partners and customers appreciate MTU's excellence

Commercial OEM business



Military OEM business



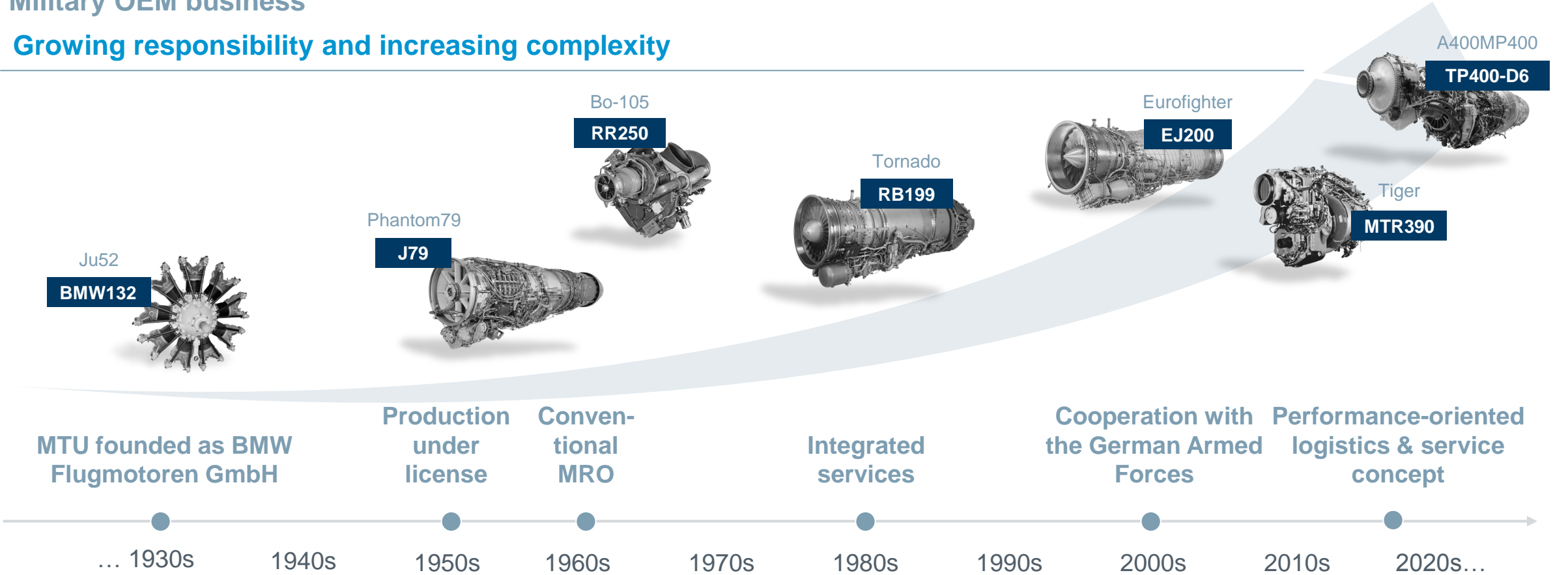
Commercial MRO business



The military OEM business has been the basis for MTU's system capability – for more than 80 years now

Military OEM business

Growing responsibility and increasing complexity



Our track record: partners and customers appreciate MTU's excellence

Commercial OEM business



Military OEM business



Commercial MRO business



MTU is one of the world's leading service providers with the largest portfolio and the strongest growth rates in the market

Commercial MRO business

Direct customer business



Efficient flowline production in Hannover

Analysis, consulting and engine expertise

Customized and flexible solutions

OEM partnerships



Advanced GP7000 tested

Standardization and industrialization of processes

Reduction of costs and sharing of investments

Airline partnerships



Partnership with China Southern Airlines

MRO know-how: processes, systems, people

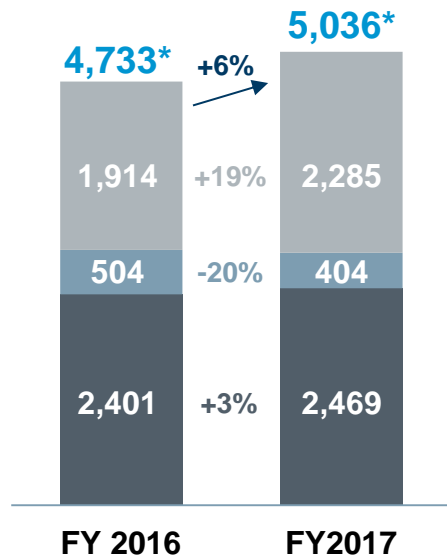
Best practice in a best-cost environment

In 2017, MTU achieved record sales and earnings once again – we keep our promises

2017 financial figures

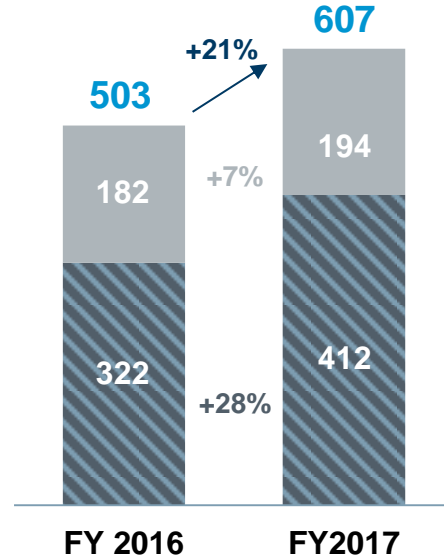
Revenues

[million €]



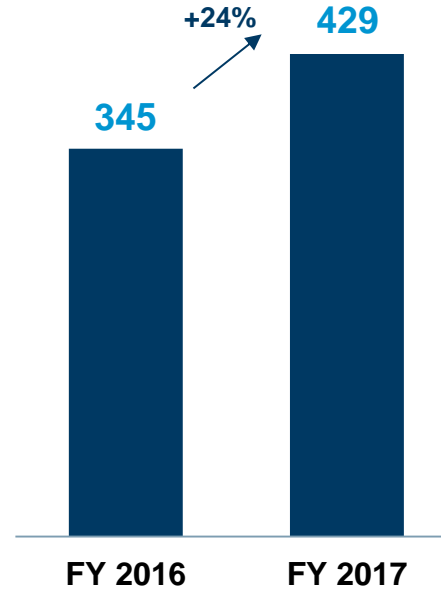
EBIT adj.

[million €]



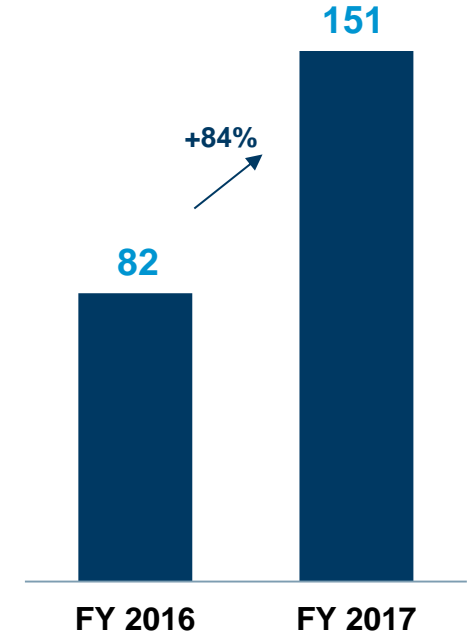
Net Income

[million €]



Free Cash Flow

[million €]



● Comm. OEM business ● Military OEM business ● Total OEM business ● Comm. MRO ● Total

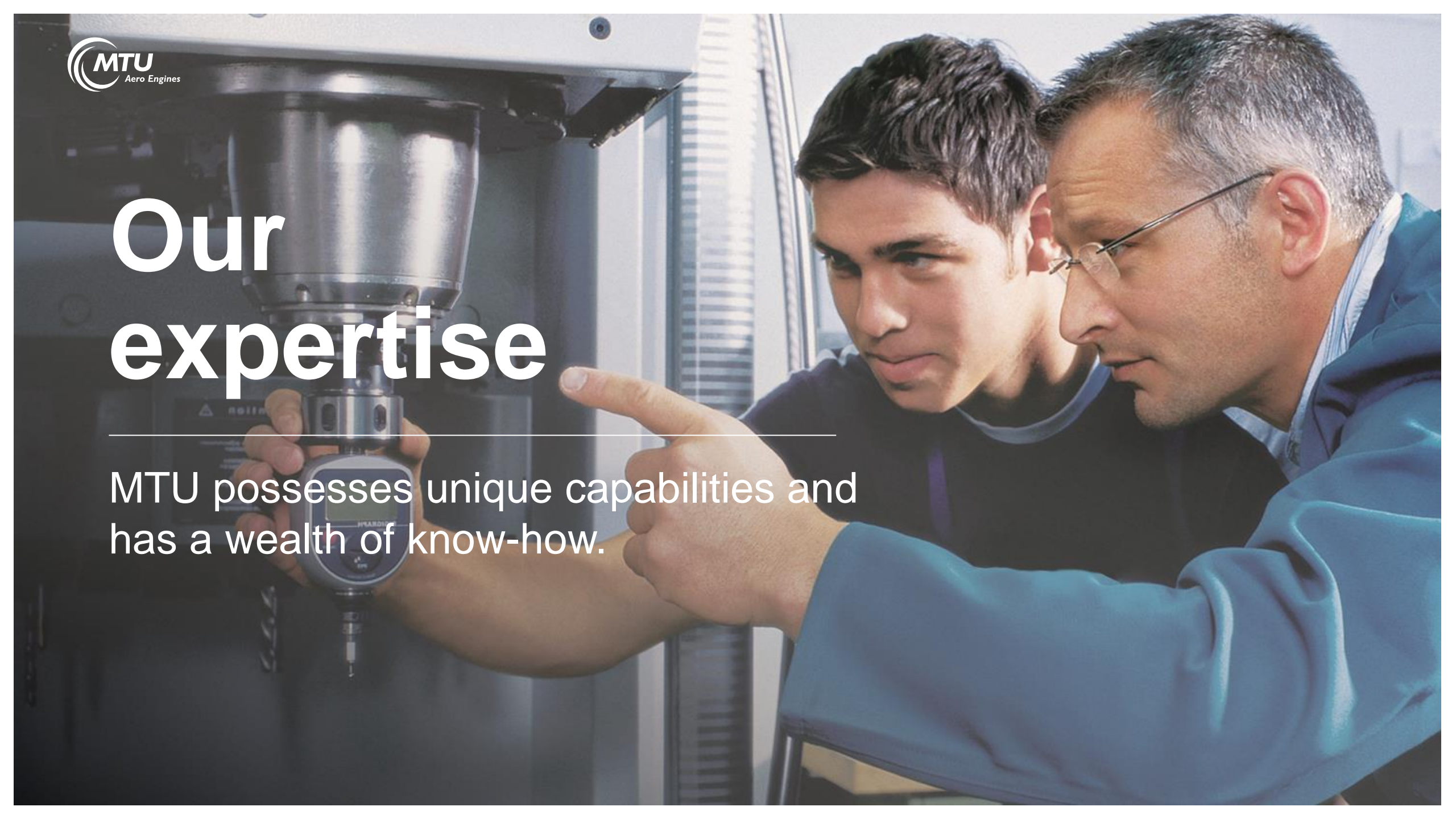
* Consolidated values

July 2018

© MTU Aero Engines AG. The information contained herein is proprietary to the MTU Aero Engines group companies.

Our expertise

MTU possesses unique capabilities and has a wealth of know-how.



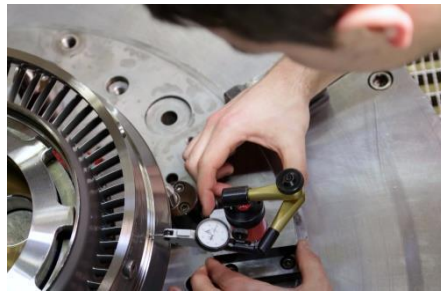
MTU possesses unique capabilities and has a wealth of know-how

Expertise



Technology

We are continuously expanding our technological lead by identifying and setting revolutionary trends



Processes

We deliver on time, with the right quality and at reasonable costs – digitalization opens up further potential for MTU, sustainability is our basic principle



Partnerships

We enter into sustainable partnerships – an essential prerequisite for MTU's long-term success



People

We boast more than 10,000 engine experts – innovative and competent



Locations

Through our 14 locations worldwide, we are close to our customers

Boasting comprehensive system expertise, MTU focuses on five core engine competencies - three core components and on unique manufacturing and maintenance processes



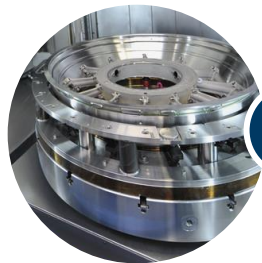
1

High-pressure compressor (HPC)



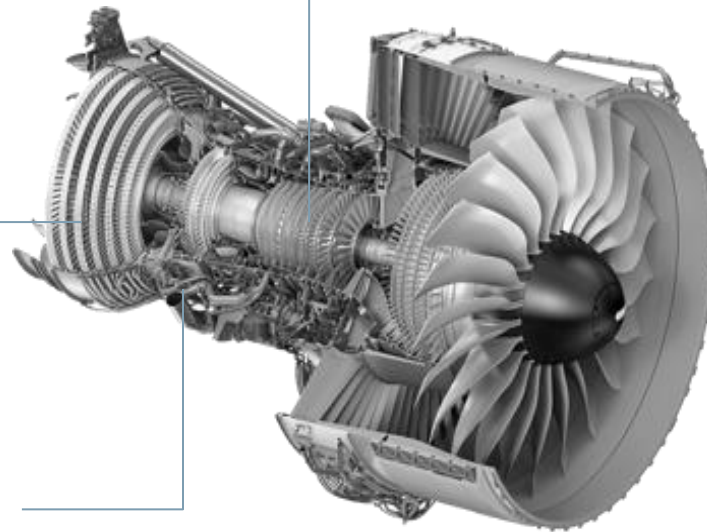
2

Low-pressure turbine (LPT)



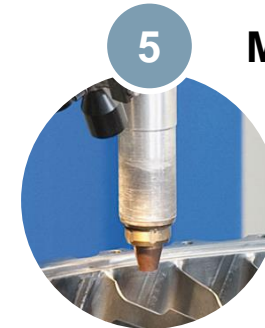
3

Turbine center frame (TCF)



4

Manufacturing



5

Maintenance

The geared turbofan is setting new standards - together with our partners, MTU will continue to expand its technological leadership in the future

Technology – today and tomorrow

The geared turbofan today

16%
reduction in fuel burn

Approx. 75%
reduction of the noise footprint

Fewer emissions
CO₂ / NO_x

MRO cost savings
25% fewer stages, 45% fewer blades, lower operating temperature

The next-generation geared turbofan (EIS 2030+)

Lowest fan-pressure ratios at very high bypass ratios
BPR 14-20*

Very high overall pressure ratio
OPR 60+ **
within the highly integrated compressor system

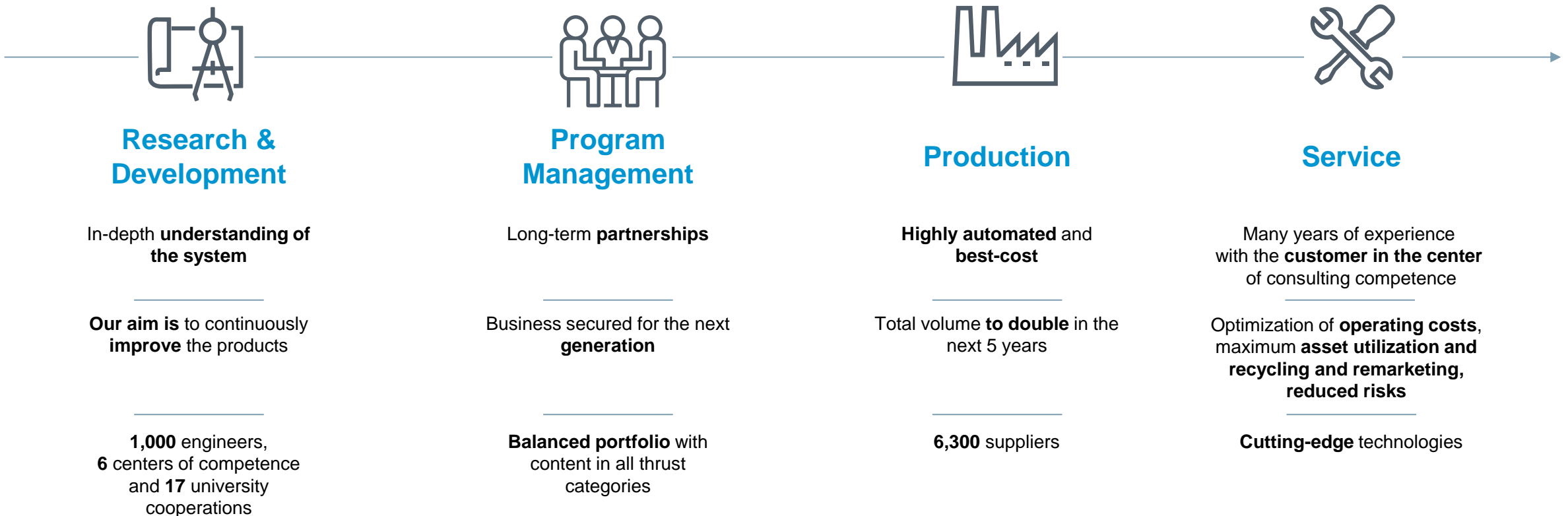
Temperature-resistant lightweight materials

High-speed, **highly efficient** expansion system

Source: P&W | * BPR = Bypass Ratio | ** OPR = Overall Pressure Ratio

We deliver on time, in the right quality and at reasonable costs - digitalization opens up further potential for MTU, sustainability is our core principle

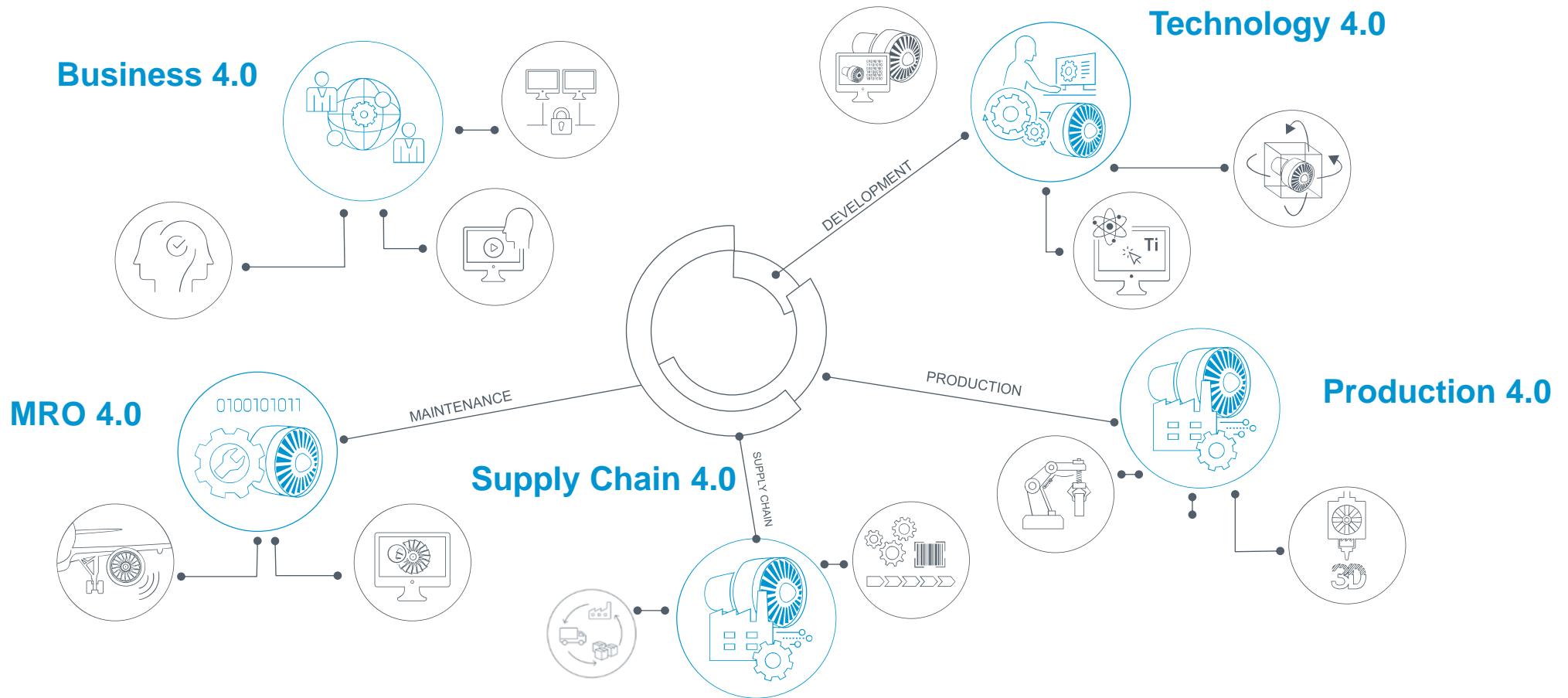
Processes



Sustainability & digitalization

As a technology leader, MTU uses digitalization primarily to further optimize processes and tools, i.e. to continuously increase efficiency and reduce costs

Digitalization



As a company, we take responsibility for our products, employees, customers, the environment and our society

Sustainability



**Product
responsibility**



**Responsibility
toward employees**



**Environmental
protection**



**Sustainable
business practices**



**Commitment to
society**

We create sustainable partnerships – an essential prerequisite for MTU’s long-term success

Research & Development

- 6 centers of competence
- 17 cooperations with universities
- National and EU research projects
- Technology network

- ✓ Risk minimization
- ✓ Increase in efficiency
- ✓ Complementary technology

Production

- 6,300 suppliers
- Long-term partnerships
- Double sourcing

Programs

- Pratt & Whitney
- General Electric
- Rolls-Royce, Safran, Avio, ITP
- Air forces

- ✓ Risk minimization
- ✓ Increase in efficiency
- ✓ Complementary technology
- ✓ Revenues/market access

Service

- Airline customers
- OEM networks
- Airline joint ventures
- External vendors
- Sumitomo
- Air forces

We boast more than 10,000 innovative and competent engine experts



More than 60
different nations
work under the umbrella
of MTU Aero Engines



Approx. 20 years
is the average job tenure
of MTU's workforce
(in Germany)



Approx. 80%
of the total
workforce are
engineers or technicians*



350
apprentices at
German locations

We are innovative and competent

customer-oriented

committed

reliable

high-tech

connected

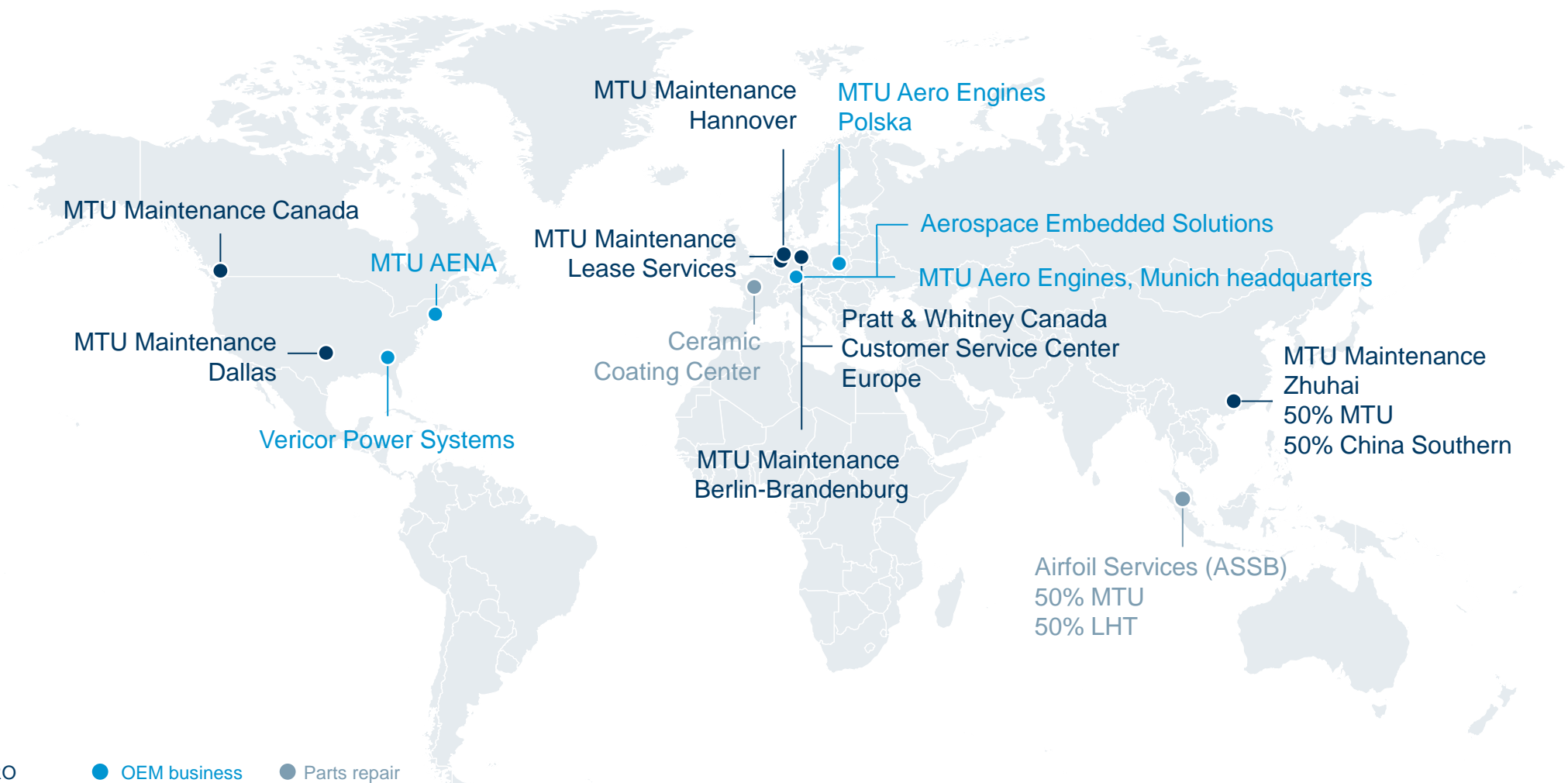
sustainable

results-oriented

excellent

efficient

With our 14 locations worldwide we are close to our customers



● Engine MRO ● OEM business ● Parts repair

For questions relating to...

...our **company**



...our **commercial engine business**



...our **commercial service portfolio**



...our **military engine business**



...our **military service portfolio**



...our **technological expertise**



...the **sustainability** of our products



...our **financial figures**



...**job opportunities** at MTU



Click the relevant icon for more information





Let's shape the future together!





Thank you.

July 2018



Proprietary Notice

This document contains proprietary information of the MTU Aero Engines AG group companies. The document and its contents shall not be copied or disclosed to any third party or used for any purpose other than that for which it is provided, without the prior written agreement of MTU Aero Engines AG.