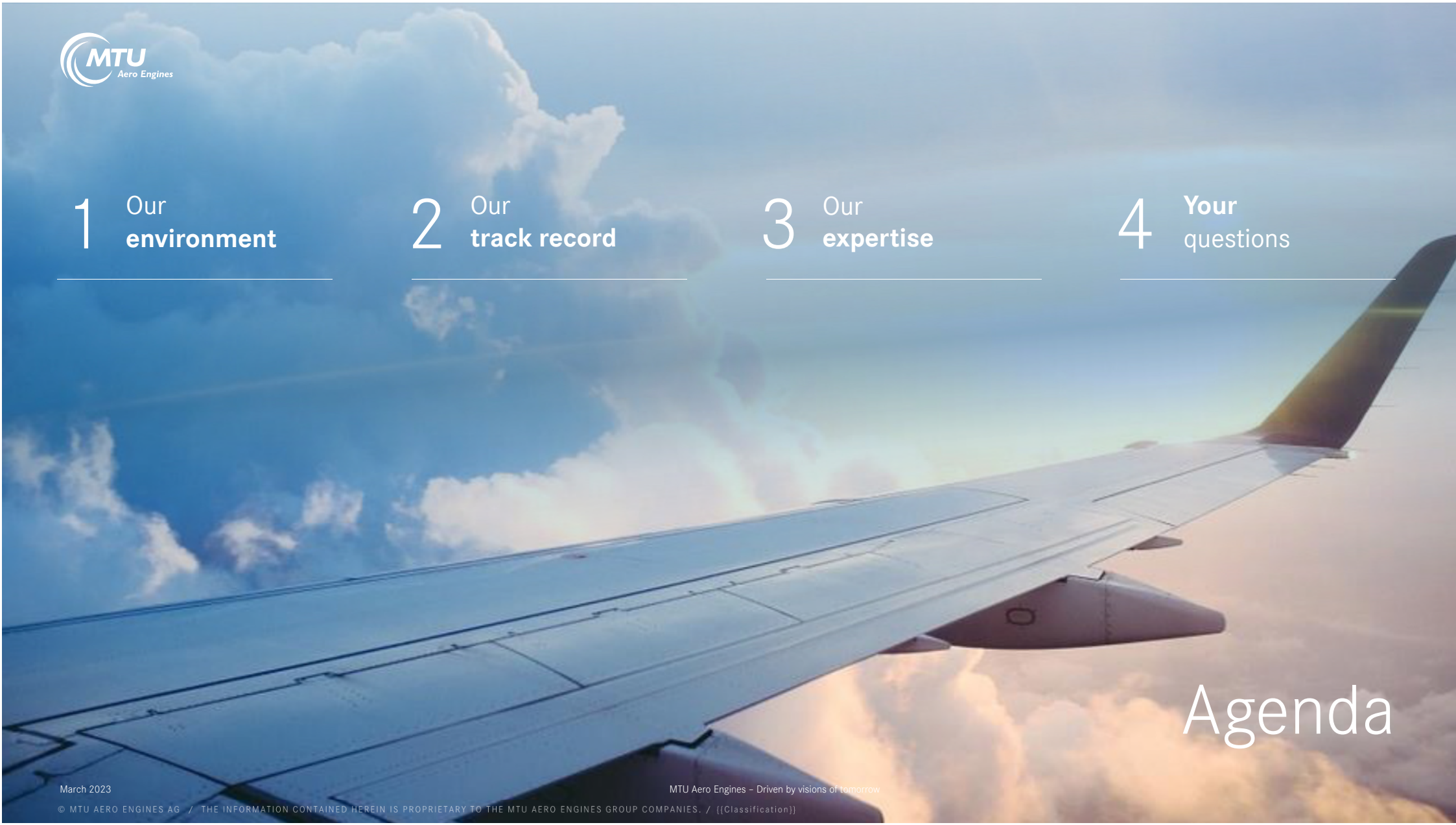
MTU Aero Engines – Driven by visions of tomorrow

March 2023



Agenda

1 Our **environment**

2 Our **track record**

3 Our **expertise**

4 **Your** questions

March 2023

MTU Aero Engines – Driven by visions of tomorrow

1 Our environment

We shape the future of aviation!

A passenger aircraft is made up of up to

6 million components

Fuel consumption per 100 passenger kilometers:

2.9 liters of kerosene

Nearly doubling the active fleet

to **48,000 aircraft** by 2040

~ 2 billion people

out of 7.95 billion have flown in an aircraft to date

The geared turbofan reduces

75% of the noise footprint

March 2023

MTU Aero Engines – Driven by visions of tomorrow

We shape the future of aviation!

What we do?

Design, development, production and **support of aircraft engines** in all thrust categories

Commercial business: 30% of aircraft have MTU technology on board

Military business: full system capability, for more than 80 years

Commercial MRO: worldwide leader in customized engine service solutions

MRO-Portfolio: 1.100+ Shop Visits p.a. for 30+ Engine types

Fiscal year 2023*: Revenue around € 6.3 billion, EBIT adj. € 818 million

How we do it

People: More than 12,000 engine experts at 18 locations

Partnerships: with all OEMs, airlines and the German Air Force (program shares from 5% up to 40%)

Technology: 300 technology projects, 2,675 patents and 700 inventors

Products: High-pressure compressor, low-pressure turbine, turbine center frame

Process: Lifetime Excellence (lifecycles from 25 to 50 years)

Culture: innovative and competent

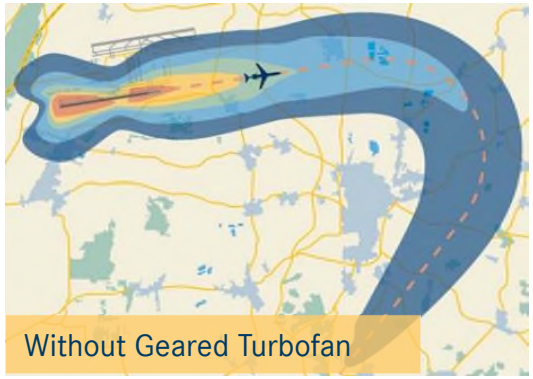
~tenfold** increase in share value since 2005

€ 4 billion invested in approx. 10 years

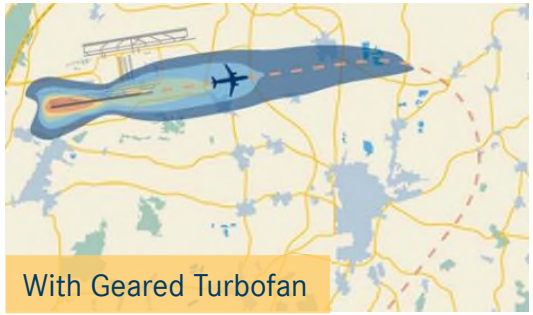
* Adjusted Values / ** Basis: Stock price March 30 2023

The Geared Turbofan Is Setting New Standards

Noise Footprint

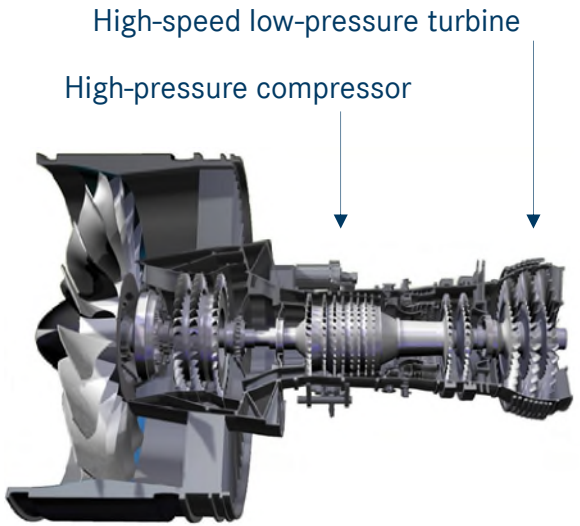


Munich International Airport (MUC)



Noise Simulation: Pratt & Whitney SEL Contour Source: Wyle Laboratories

MTU Contribution



Geared Turbofan reduces:
- Noise footprint by 75%
- Fuel consumption and CO_2-emissions by 16%
- NO_x-emissions by 50%

Chosen for three Airframes

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

Balanced portfolio

Benchmark competitiveness

Leading technology

Innovative culture

2 Our track record

Partners and customers appreciate MTU’s excellence

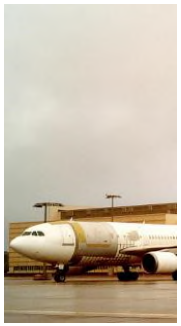
MTU looks back on many important names from the German industrial history – from 1934 to date

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
MTU Aero Engines is admitted to the DAX, Germany's primary stock index

Focus on **military** applications

Focus on **commercial** applications

MTU is an essential partner in the engine value chain

Material suppliers*	Engine component suppliers*	**Subsystem/module suppliers***	Engine OEMs*	Airframers*	**Airline operations**
CPP	senior Aerospace	KAWASAKI HEAVY INDUSTRIES, LTD.	GE Aviation	AIRBUS	
PCC	Hanwha Aerospace	IHI	Pratt & Whitney	BOEING	
ALCOA	MB AEROSPACE	MITSUBISHI HEAVY INDUSTRIES, LTD.	Rolls-Royce	EMBRAER	
ATI		MTU Aero Engines	SAFRAN	Gulfstream	
				DASSAULT AVIATION	
				BOMBARDIER	
				Cessna	
				COMAC	

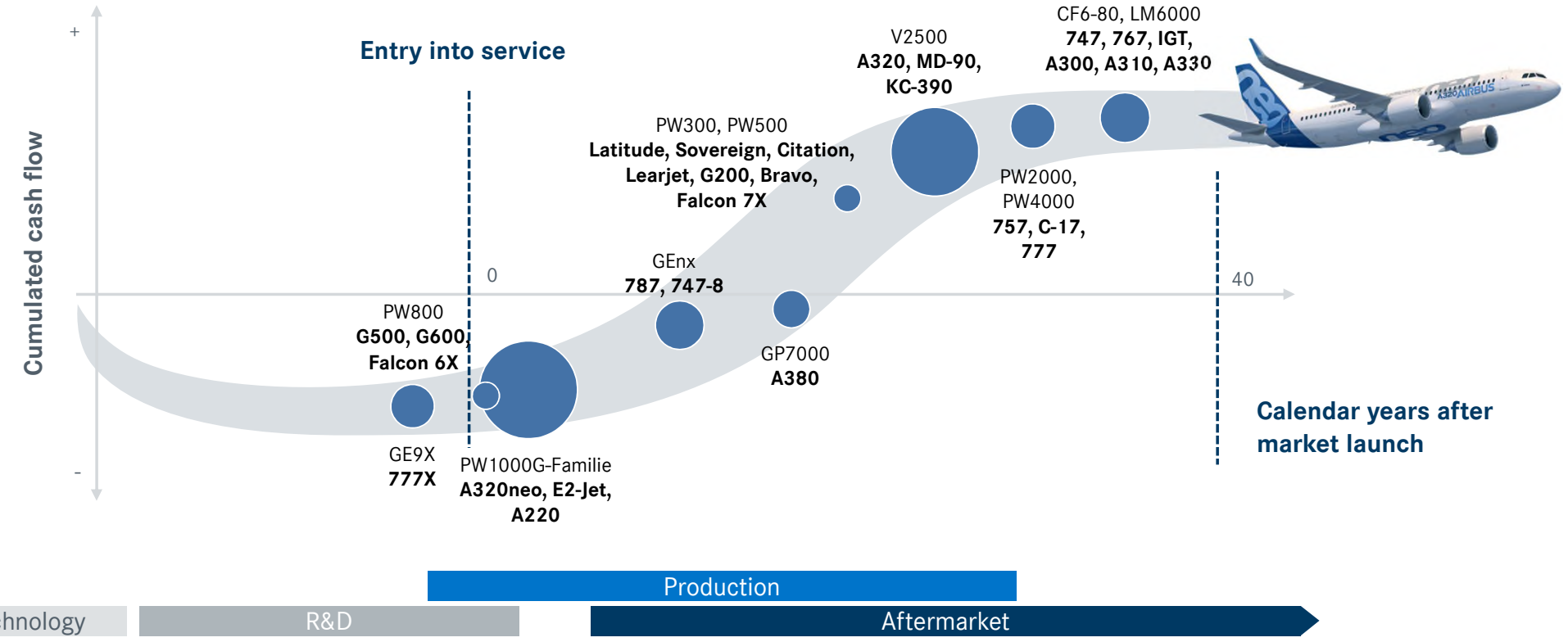
MRO

Engine MRO — MTU Maintenance

OEM market | **Aftermarket**

*selected market participants

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



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

Commercial OEM business

Share of total revenues ca. 26%

Balanced product portfolio in all thrust categories

Decades of partnership with OEMs

Military OEM business

Share of total revenues ca. 8%

European and U.S. engine programs

Leading partner of the German Armed Forces

Commercial MRO business

Share of total revenues ca. 66%

Services: maintenance, leasing and asset management

Direct customer business, partner of OEMs and airlines

MTU group fiscal year 2023*: Revenue € 6.3 billion / EBIT € 818 million

*Adjusted values

3 Our expertise

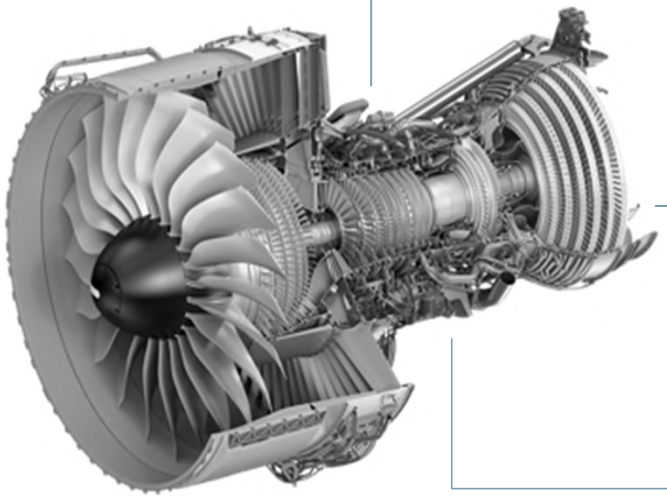
MTU possesses unique capabilities and has a wealth of know-how.

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

Engineering

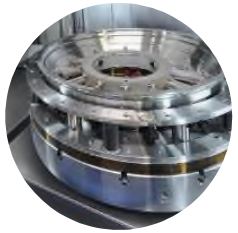
Manufacturing

Maintenance



High-pressure compressor (HPC)

Low-pressure turbine (LPT)



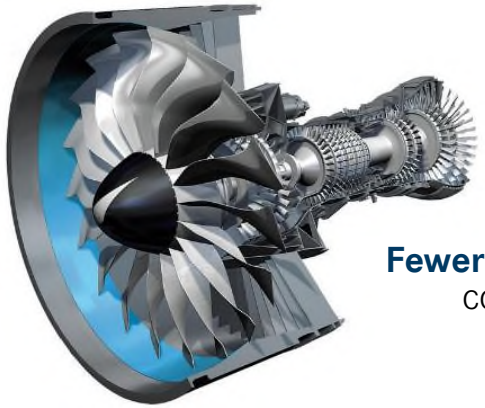
Turbine center frame (TCF)

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

1st generation geared turbofan - today

16%
reduction in fuel burn

Approx. 75%
reduction of the noise footprint



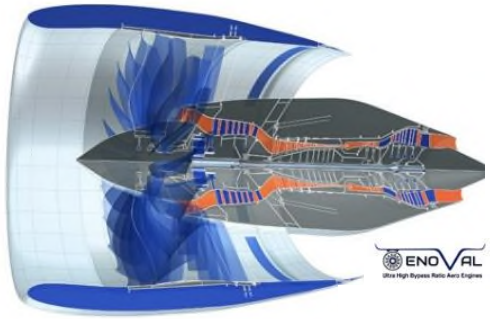
Fewer emissions
CO_2 / NO_x

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

2nd generation geared turbofan – EIS 2030+

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

10%
further reduction in fuel burn compared to 1st generation



-10EPNdb
noise (cumulated) compared to 1st generation

Temperature-resistant lightweight materials

High-speed,
highly efficient
expansion system

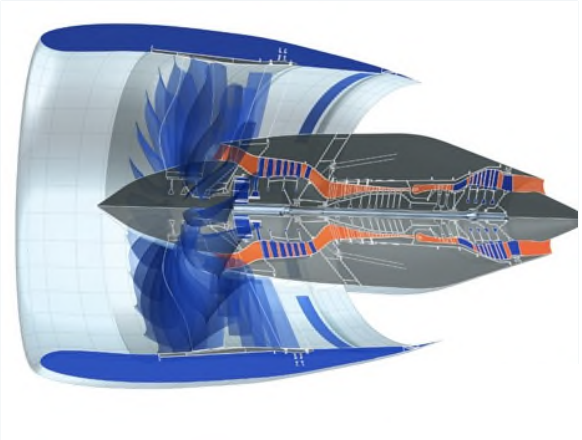
Source: P&W | * BPR = Bypass Ratio | ** OPR = Overall Pressure Ratio

New Concepts

Evolutionary

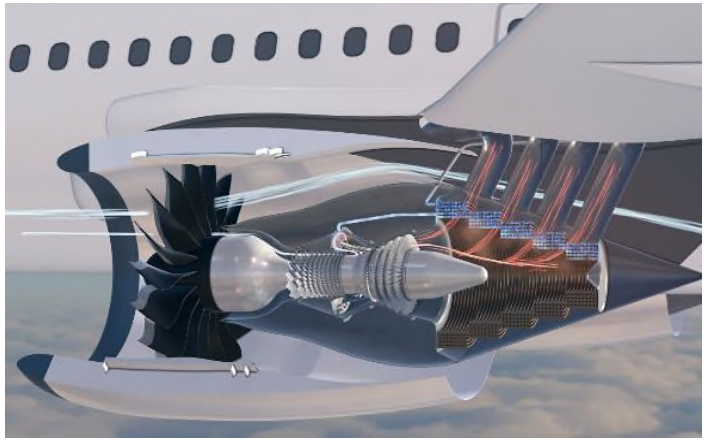
Revolutionary

Gen2 GTF



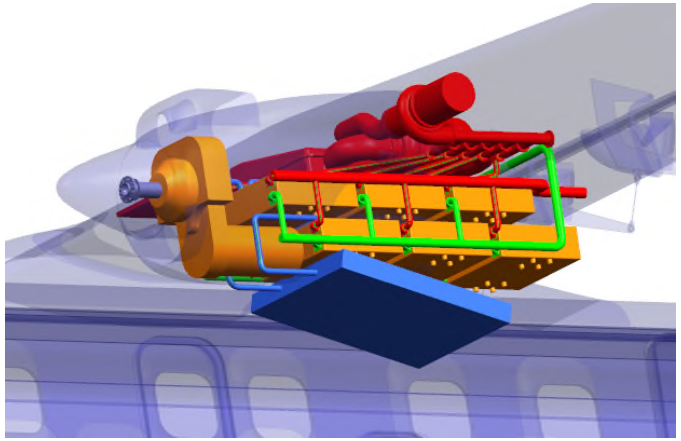
Minimum 10% reduction in fuel burn resp. energy consumption, -10EPNdb noise (cumulated) [1)]

Water-Enhanced Turbofan (WET)



Up to 20% reduction in fuel burn resp. energy consumption, significant reduction of the climate impact, -80% NO_x [1)] and contrails

Flying Fuel Cell™



-100% CO_2 and NO_x [1)] and further reduction of contrail formation => almost climate neutral

1) Im Vergleich zu heutigem GTF-Antrieb

We boast about 12,000 innovative and competent engine experts




Approx. 55
different nations
work under the umbrella
of MTU Aero Engines

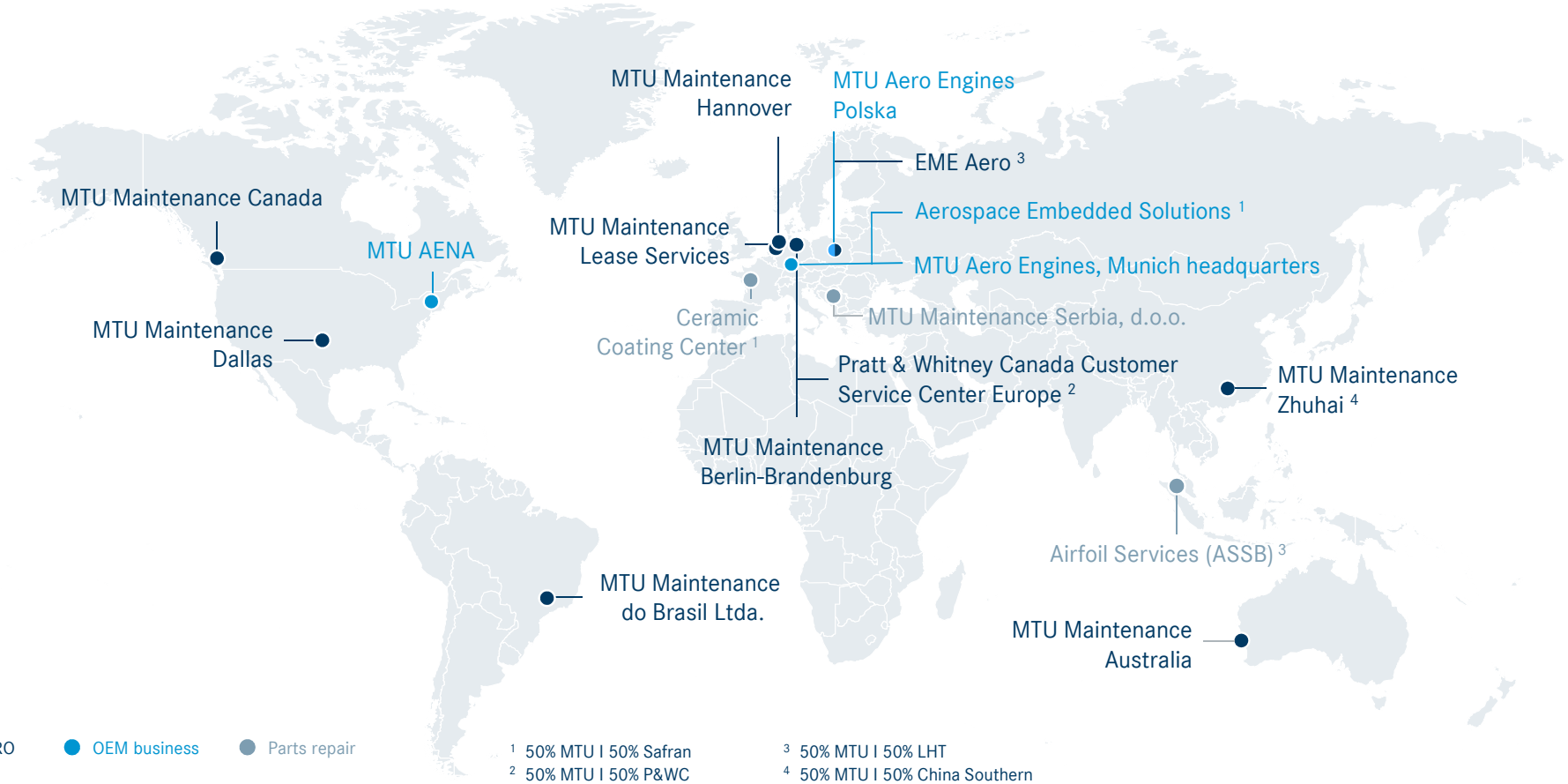
Approx. 14 years
is the average job tenure
of MTU's workforce
(in Germany)

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

More than 350
apprentices at
German locations

*incl. scientists

With our locations worldwide we are close to our customers



1 50% MTU I 50% Safran
2 50% MTU I 50% P&WC
3 50% MTU I 50% LHT
4 50% MTU I 50% China Southern

March 2023

4
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!

March 2023

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