MTU Aero Engines – Driven by visions of tomorrow

March 2021
Agenda

1. Our environment
2. Our track record
3. Our expertise
4. Your questions
We shape the future of aviation!
The geared turbofan reduces 75% of the noise footprint.

Nearly doubling the active fleet to **48,000 aircraft** by 2040.

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

~ **2 billion people** out of 7.6 billion have flown in an aircraft to date.

Fuel consumption per 100 passenger kilometers: **2.9 liters of kerosene**.
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 per year for more than 30 different engine types
- **Fiscal year 2020**: Revenue around € 4 billion, EBIT adj. € 416 million

**How we do it**

- **People**: Around 10,000 engine experts at 16 locations
- **Partnerships**: with all OEMs, airlines and the German Air Force (program shares from 5% up to 40%)
- **Technology**: 150 technology projects, 400 patents and 200 invention disclosure reports per year
- **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

* Basis: 30 December 2020

March 2021
© MTU Aero Engines AG. The information contained herein is proprietary to the MTU Aero Engines group companies.
The Geared Turbofan Is Setting New Standards

**Noise Footprint**

*Without Geared Turbofan*

Munich International Airport (MUC)

*With Geared Turbofan*

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

**MTU Contribution**

- High-speed low-pressure turbine
- High-pressure compressor

**Chosen for four Airframes**

- Airbus A320neo
- Airbus A220
- Embraer E2-Jets Gen2
- Irkut MC-21

Geared Turbofan reduces:
- Noise footprint by 75%
- Fuel consumption and CO₂-emissions by 16%
- NOₓ-emissions by 50%
MTU pursues a sustainable growth strategy in all of its business segments - based on stable and long-term customer relationships.
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

March 2021
© MTU Aero Engines AG. The information contained herein is proprietary to the MTU Aero Engines group companies.
MTU is an essential partner in the engine value chain

- Material suppliers*
- Engine component suppliers*
- Subsystem/module suppliers*
- Engine OEMs*
- Airframers*
- Airline operations

*selected market participants

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

<table>
<thead>
<tr>
<th>Commercial OEM business</th>
<th>Military OEM business</th>
<th>Commercial MRO business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of total revenues ~ 26 %</td>
<td>Share of total revenues ~ 12 %</td>
<td>Share of total revenues ~ 62 %</td>
</tr>
<tr>
<td>Balanced product portfolio in all thrust categories</td>
<td>European and U.S. engine programs</td>
<td>Services: maintenance, leasing and asset management</td>
</tr>
<tr>
<td>Decades of partnership with OEMs</td>
<td>Leading partner of the German Armed Forces</td>
<td>Direct customer business, partner of OEMs and airlines</td>
</tr>
</tbody>
</table>

MTU group fiscal year 2020:
Revenue € 3.977 billion / EBIT € 416 million
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.
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: CO₂ / NOₓ
- 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
- Temperature-resistant lightweight materials
- High-speed, highly efficient expansion system

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

March 2021
© MTU Aero Engines AG. The information contained herein is proprietary to the MTU Aero Engines group companies.
# New Concepts

<table>
<thead>
<tr>
<th>Evolutionary</th>
<th>Revolutionary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gen2 GTF</strong></td>
<td><strong>Water Enhanced Turbofan (WET) Engine</strong></td>
</tr>
</tbody>
</table>

- **Minimum 10% reduction in fuel burn resp. energy consumption, -10EPNdb noise (cumulated)**
- **Minimum 25% reduction in fuel burn resp. energy consumption, significant reduction of the climate impact, -80% NOₓ**
- **-100% CO₂ and NOₓ**

1) Compared to 1st generation
We boast about 10,000 innovative and competent engine experts

More than 60 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 300 apprentices at German locations

March 2021
© MTU Aero Engines AG. The information contained herein is proprietary to the MTU Aero Engines group companies.

*incl. scientists
With our locations worldwide we are close to our customers
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!
Thank you.

March 2021
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.