



Welcome to Langenhagen

Investor & Analyst Day 2019

Agenda – MTU Investor & Analyst Day 2019

Time	Event	Speaker
11:15 – 11:25	Welcome	Thomas Franz , VP Investor Relations
11:25 – 11:45	Market environment	Reiner Winkler , Chief Executive Officer
11:45 – 12:35	Technology roadmap Extension of production facilities Working capital management Outlook Q & A	Lars Wagner , Chief Operating Officer
12:35 – 13:30	Lunch	
13:30 – 14:30	Market success in OEM and MRO Key growth drivers Outlook Q & A	Michael Schreyögg , Chief Program Officer
14:30 – 15:20	Financials Capital structure management Guidance 2020 Q & A	Peter Kameritsch , Chief Financial Officer
15:20 – 15:50	Executive summary Q & A	Reiner Winkler , Chief Executive Officer
15:50 – 16:10	Coffee break	
16:10 – 17:30	Shop tour	Shop tour guides

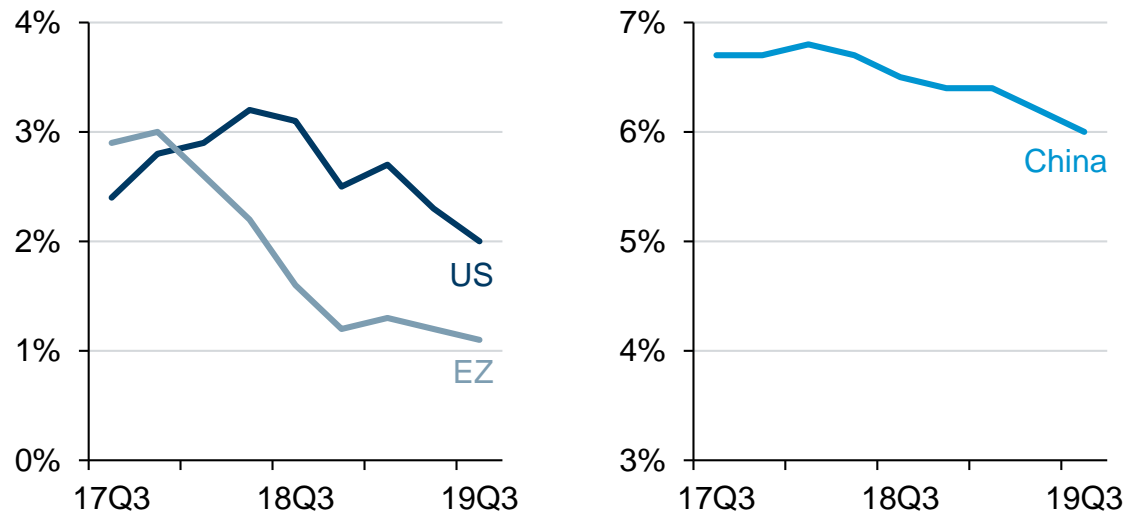


MTU's market environment

Reiner Winkler | Chief Executive Officer (CEO)

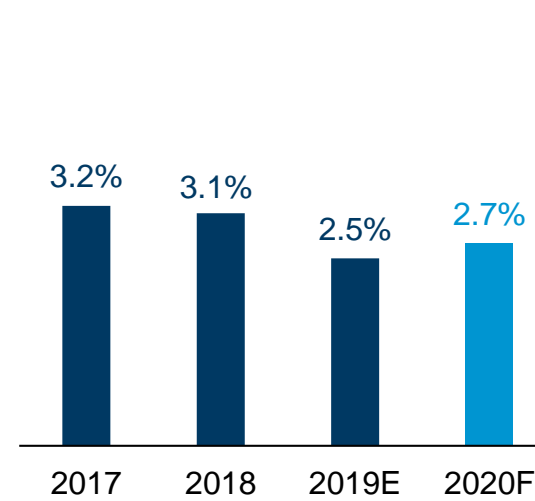
Slow down in world economy in 2019 but positive outlook for 2020

GDP growth of top 3 economies (y-o-y)

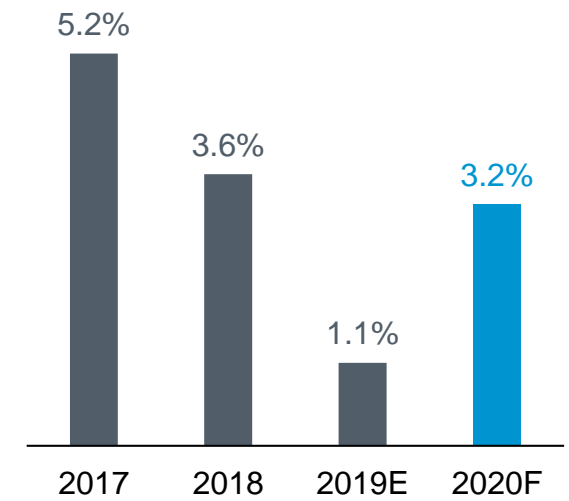


- Strong US growth but softening, US yield curve inverted
- Eurozone in a downturn since 2018
- China's growth is moderating, partly because of the trade war, no fast resolution expected

Global GDP growth



Global trade growth

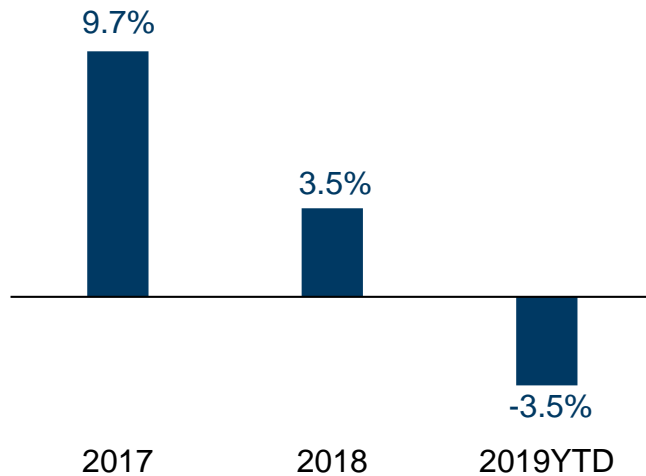


The IMF acknowledges risks but expects a pick-up in growth in 2020 based on a recovery in the emerging markets that have been underperforming in 2019

Source: OECD, International Monetary Fund (IMF)

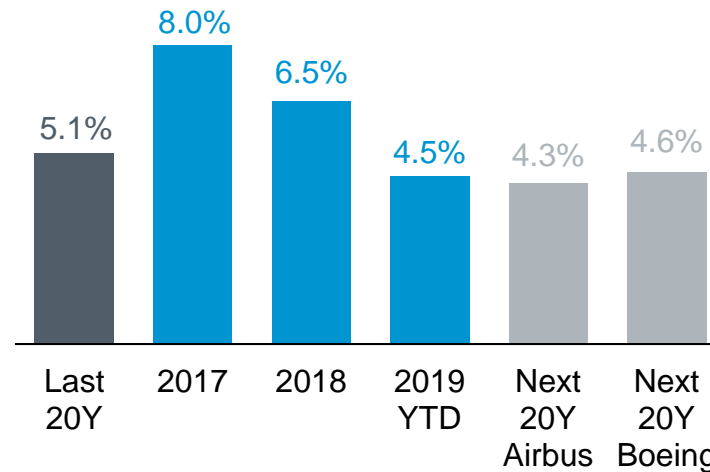
Freight traffic and oil are a concern but passenger demand remains strong

Global freight traffic growth



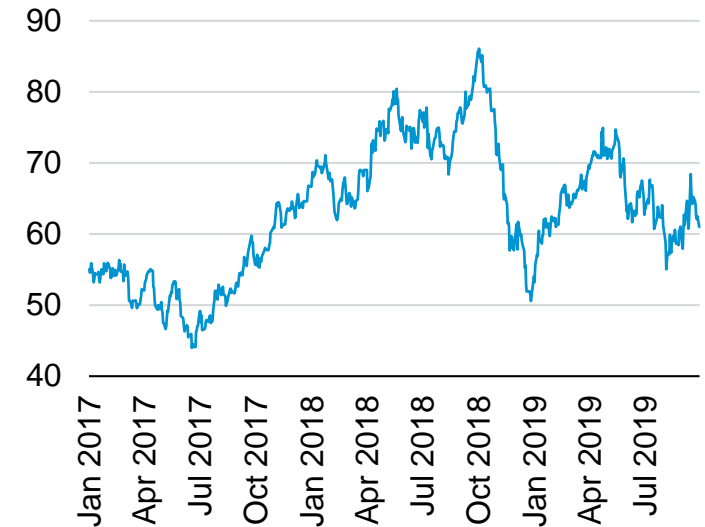
Freight traffic (10% of commercial fleet) experiencing negative growth in 2019 (Jan-Sept.)

Global passenger traffic growth



Passenger traffic growth (90% of the commercial fleet) has moderated but remains robust and in line with historical and OEM forecasts

Oil price (Brent)

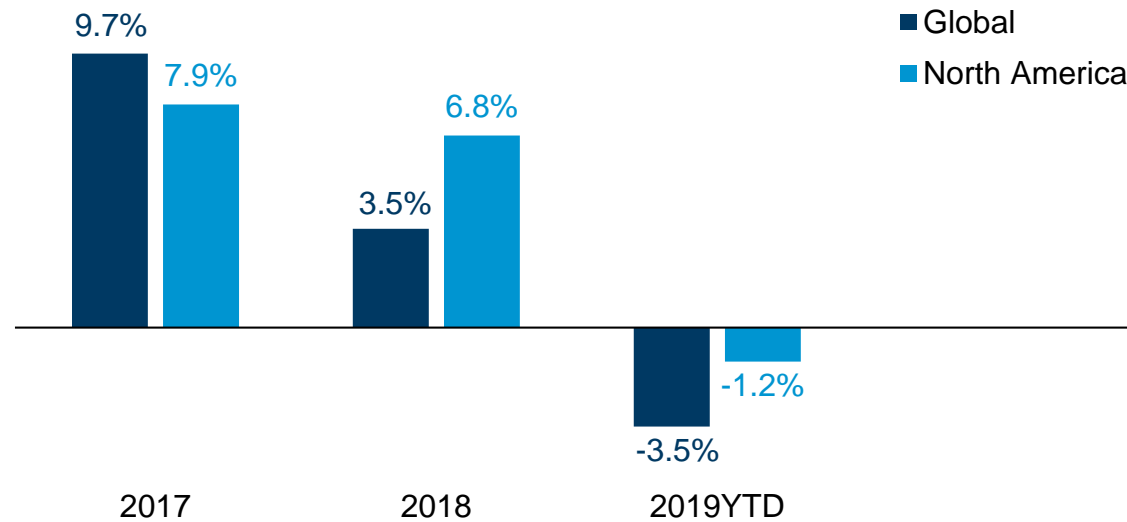


Oil price volatility increased by geopolitics in the Middle-East

Source: IATA, Airbus, Boeing

Global freight traffic is slowing down but North America is most influential to MTU

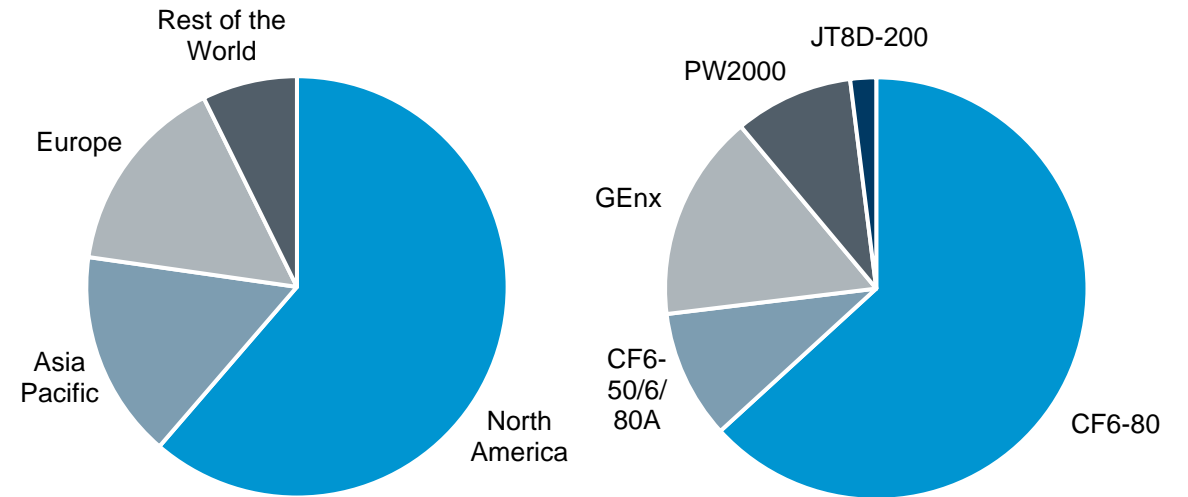
Freight traffic growth



- North American freight traffic has only started to moderate this year and less dramatically than the global metric
- Operators such as FedEx, UPS, Atlas Air or more recently Prime Air are benefiting from the continued e-commerce boom and the relative strength of the US economy

Source: IATA, Cirium Fleets Analyzer

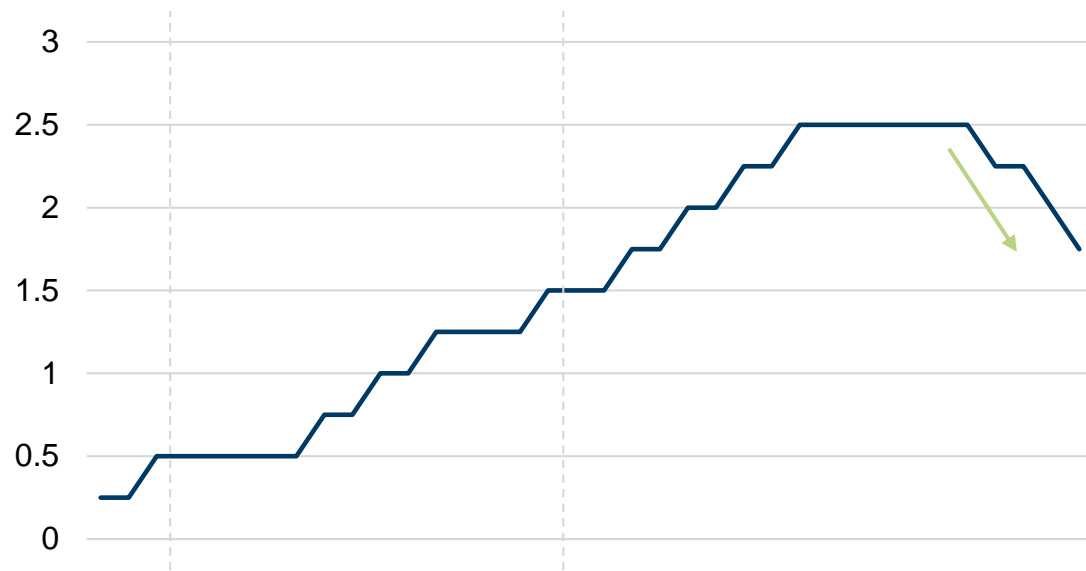
MTU fleet in cargo service – 2,200 engines



The large majority or ~ 60% of the 2,200 engines encompassed by MTU programs and powering freighter aircraft are operating in and out of North America

Softening of economic growth offer several silver linings

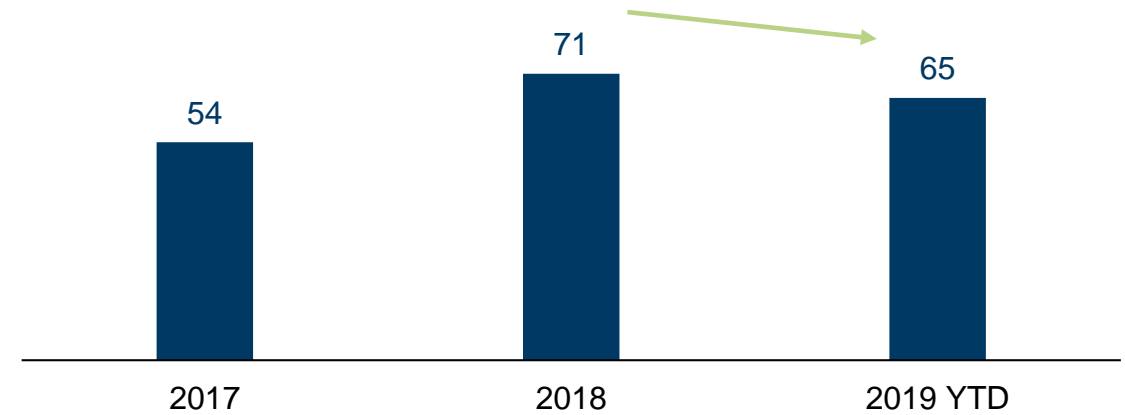
US interest rates



US interest rates are being reduced, supporting the OE backlog as well as emerging markets (weaker USD cushioning USD-denominated debt)

Source: OECD, The Economist intelligence Unit

Oil price



- The current slowdown is keeping energy prices and supply disruptions in check while US shale oil continues to limit oil prices, benefiting the aftermarket
- Following several years of production ramp-up, we see signs of moderation, which could additionally offer potential relief to the supply chain in terms of capacity and pricing of procured parts as well as support the aftermarket

MTU revenues have returned to above-average growth following short periods of decline

Global GDP, traffic and MTU revenue growth 2000-2017

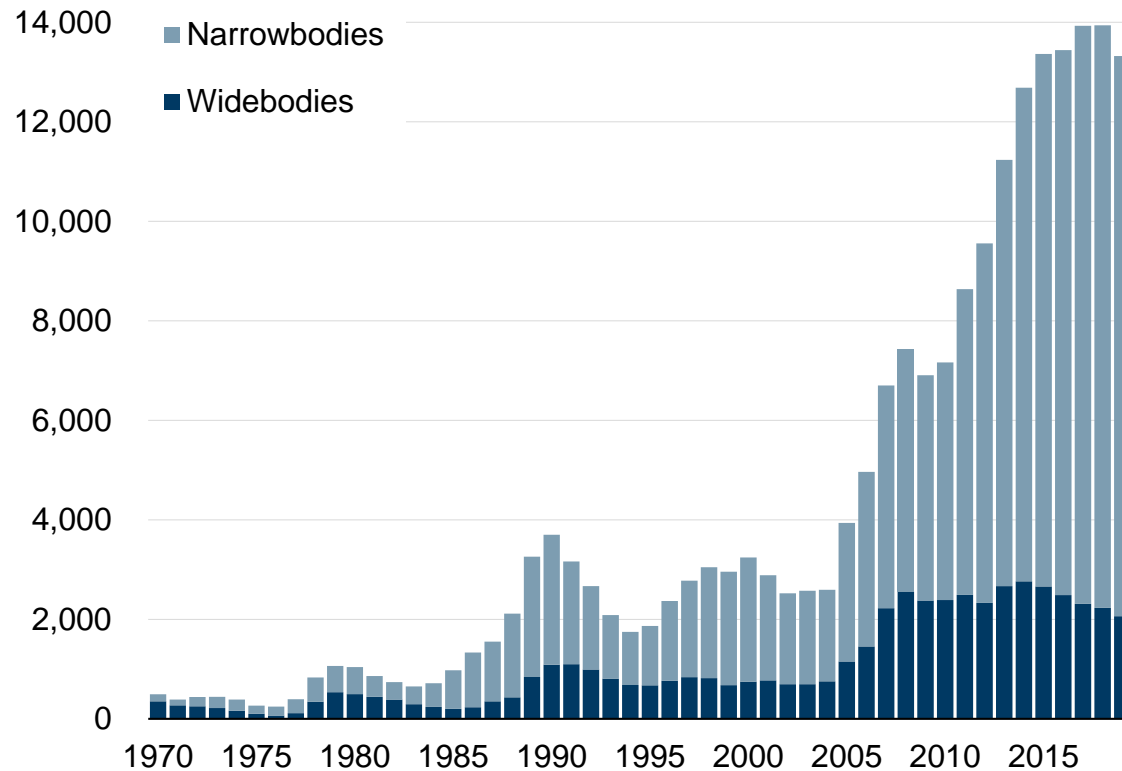
	CAGR
MTU revenues \$	6.5%
RPK	4.9%
GDP	2.5%

- Strong underlying travel demand growth with almost twice the growth rate as GDP growth. This development is expected to continue as the middle-class and urban dwellers go on growing in emerging markets
- MTU revenues (organic) outperformed traffic due to continued investment in new high-growth programs and simultaneous expansion of MTU's program share
- Experience from previous crises has shown that traffic demand and in turn MTU's revenues (organic) have always rebounded and, after short periods, returned to above average growth

High visibility and positive fundamentals for OE over the short to medium term

Backlog at historically high level, 8 years of production

Aircraft on order

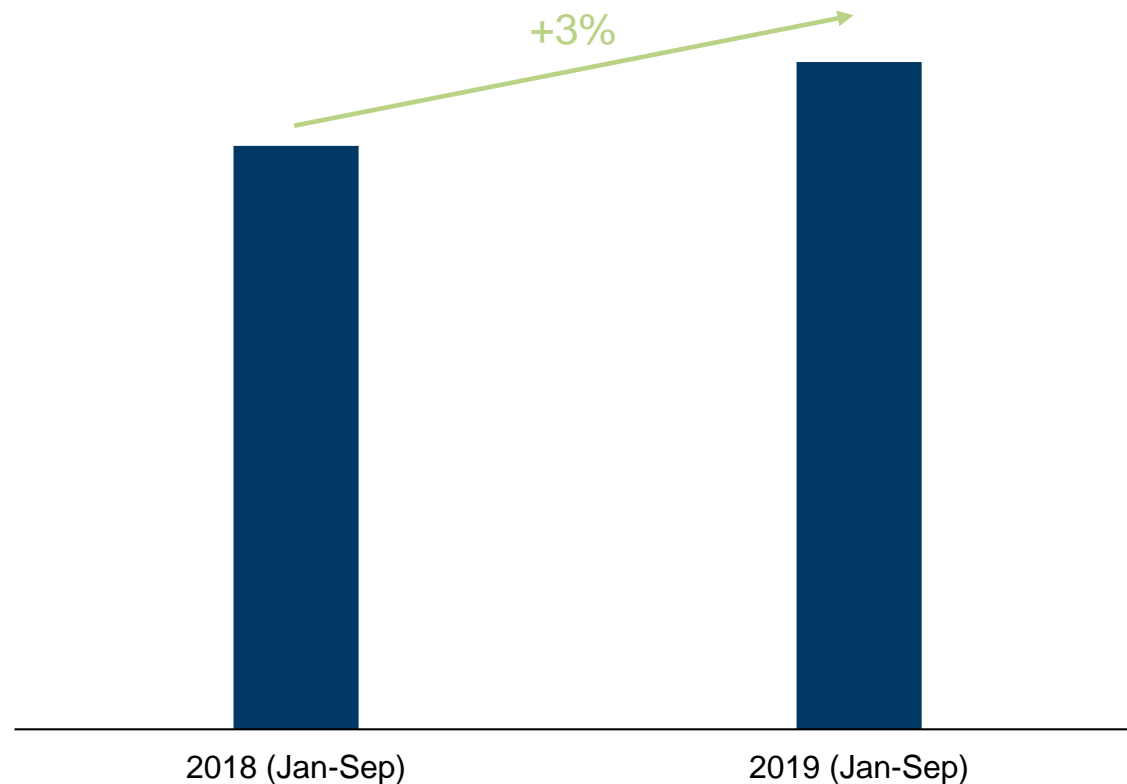


Source: Cirium Fleets Analyzer

- Growing production capacity is turning backlog into deliveries (now 8.1 years of production compared to 8.6 last year)
- High OE visibility remains, despite lower order intake in 2019
- Fundamentals remain strong for OE:
 - Interest rates are easing, in turn supporting financing and helping emerging markets dependent on USD-denominated debt
 - Oil price volatility is a reminder that new equipment is the best fuel-hedging instrument
 - Longer term, current environmental pressures put a premium on fuel efficiency
- MTU will benefit from narrowbodies' 85% backlog share reflecting airlines' shift to smaller aircraft on medium haul routes

Aftermarket growth remains robust in 2019

Flight hours of MTU programs



Source: Flightradar 24

28 November 2019

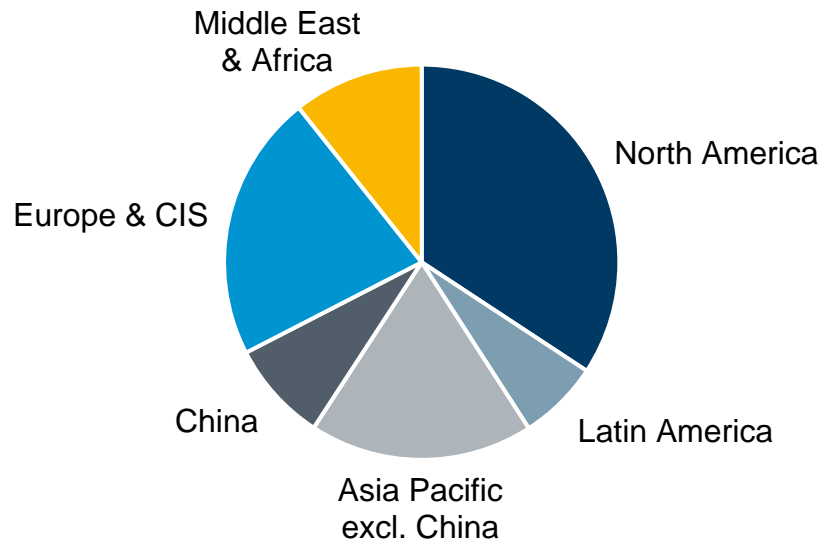
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A number of factors continue to support aftermarket demand for MTU programs

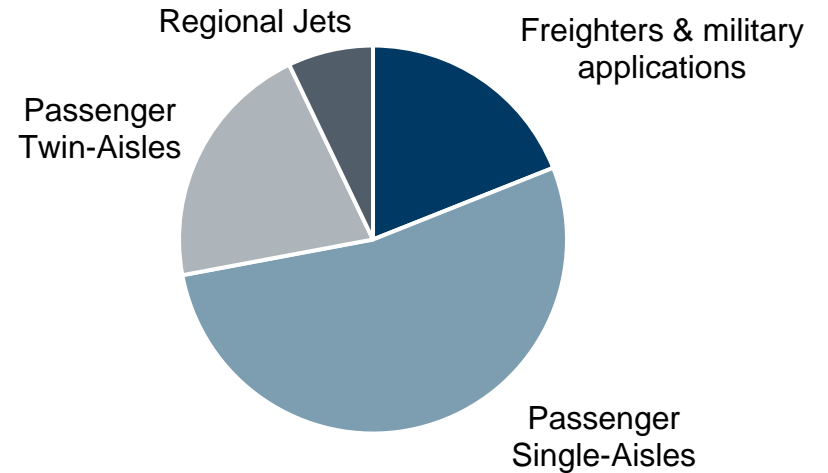
- Parked fleet and retirements in relation to the fleet remain at an all time low (park rate at 6.3%, retirement rate at 2.7%)
- Passenger traffic growth is robust (the main driver)
- North American freight growth is not immune to but apparently less affected by the current trade conflicts
- Oil price is subject to supply disruptions but remains well under 90\$ with economics acting as a downward pressure at present
- Some of MTU's aftermarket programs are benefiting from continued robust traffic demand as well as a number of temporary technical issues on competing programs

MTU's activity is diversified geographically and structurally across fleet

In service fleet and orders relevant to MTU by region and market segment (22,900 engines)



MTU's portfolio is geographically well balanced with a strong footprint in fast-growing Asian market as well as currently resilient North American market



Structurally, MTU's portfolio is also well balanced:

- Very strong presence in the fast-growing single-aisle market
- Participation in leading engine programs in the other 3 segments

Source: Cirium Fleets Analyzer, spare engines are excluded

A diversified fleet will support MTU in facing current market risks

Mitigation through fleet and backlog in programs relevant to MTU



Trade conflicts

Escalation in 2019 (US-China, Japan-Korea, US-EU, Brexit)

US freight traffic less affected
Brexit mitigation in place at MTU
Limited impact of US tariffs



Economic slowdown

US, Eurozone and China are affected

Traffic outlook remains positive
Positive impact on interest rates and oil price

MTU fleet geographically diversified with strong presence in resilient US and China



Oil price uncertainty

Key MTU programs (V2500, GTF, GP7000, GENx) are fuel efficiency leaders

Higher fuel prices support MTU backlog, lower fuel prices MTU's mature fleet



Climate impact

Rising awareness for climate impact, mainly concerning CO₂ emissions

MTU is committed to climate targets

We are committed to ambitious goals to reduce CO₂ emissions



Reduction of emission and noise levels

Our objective is to cut aircraft engine **CO₂ emissions** by up to **40%** and noise emissions by as much as **65%**.

Ambitious technology agenda CLAIRE

MTU is compliant with strategic industry goals such as **SRIA** (Strategic Research and Innovation Agenda) and **IATA** (International Air Transport Association) **Flightpath 2050**.

Sustainable aviation fuel

MTU is strongly advocating the introduction of **sustainable kerosene**, for example, through its work in the Bauhaus Luftfahrt think tank and in the Aviation Initiative for Renewable Energy in Germany (**aireg**) association.



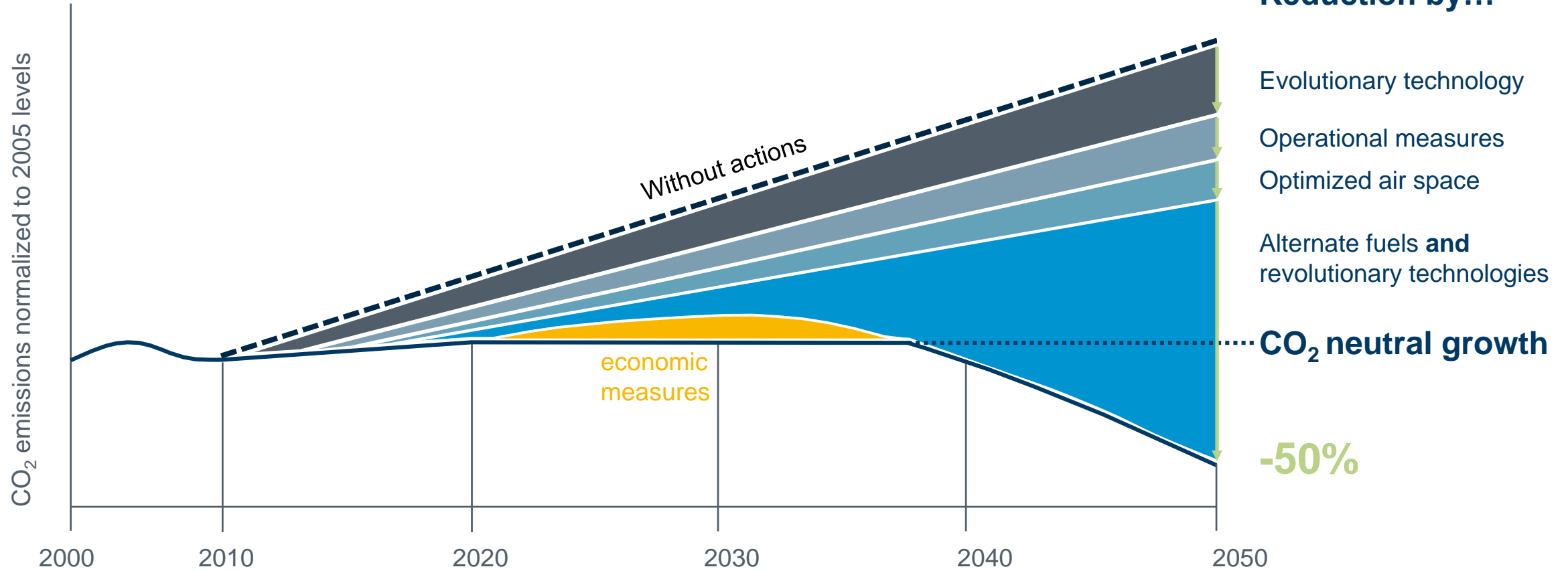


MTU's technology roadmap

Lars Wagner | Chief Operating Officer (COO)

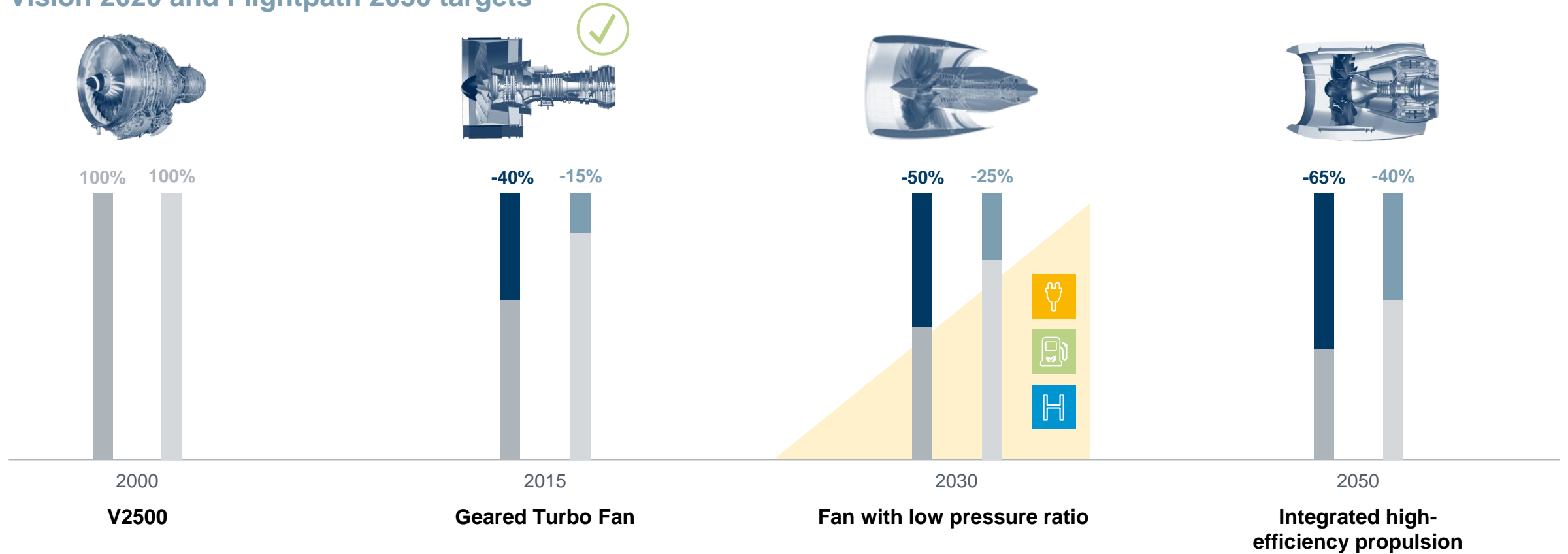
Our motivation

IATA Flightpath 2050



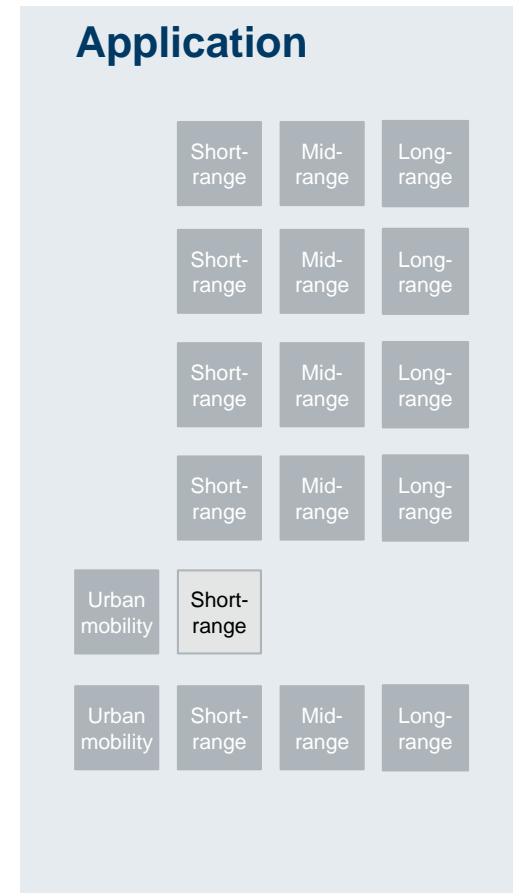
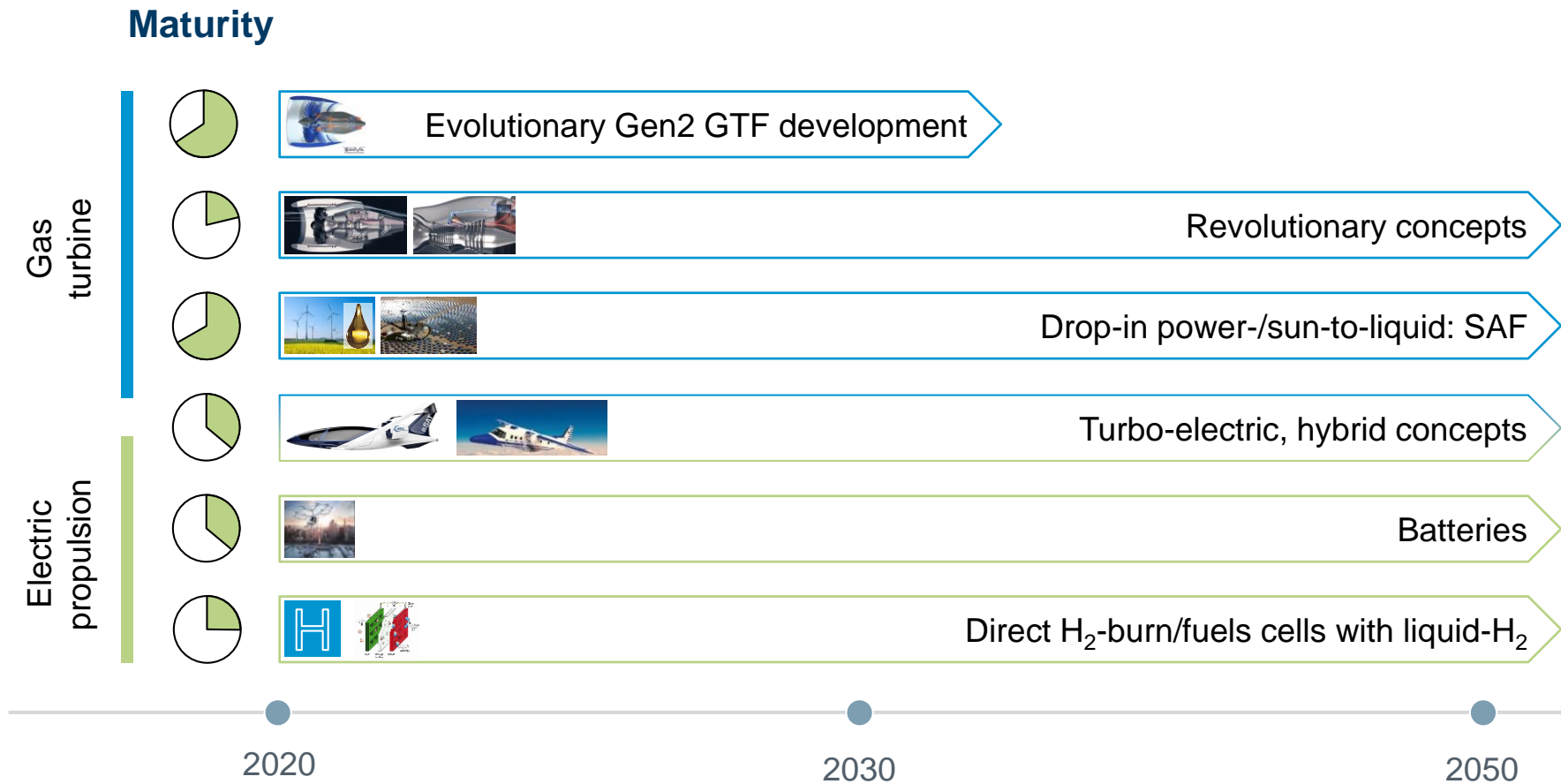
MTU's approach CLAIRE | Clean Air Engine

Vision 2020 and Flightpath 2050 targets

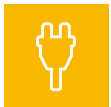
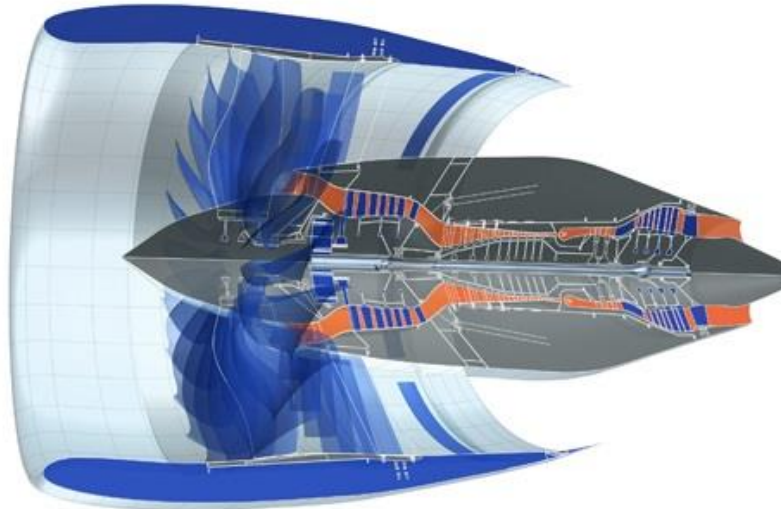


● Δ Noise reduction in % ● Δ CO₂-reduction in % ● Increase in alternate fuels

Our approach



GTF Gen2 concept for 2030+



Increase in electrical
components

Targets

- -10% fuel
- -10% dB noise

Further CO₂ reduction by:



Drop-in fuels
Sustainable aviation fuels SAF



Hydrogen

New European Fighter Engine – NEFE

Military technology development

Targets

- Long range
- High mission flexibility
- Low observability
- High availability
- Low operation costs

- First prototype 2031+
- EIS 2040+



Key enabler

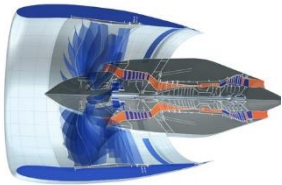
- Variable cycle engine technology
- “World class” components
- High-temp, low-weight materials
- Integrated aircraft/engine heat management
- Fully digitalized design and aftermarket processes

Safran and MTU are committed to jointly developing a new fighter engine

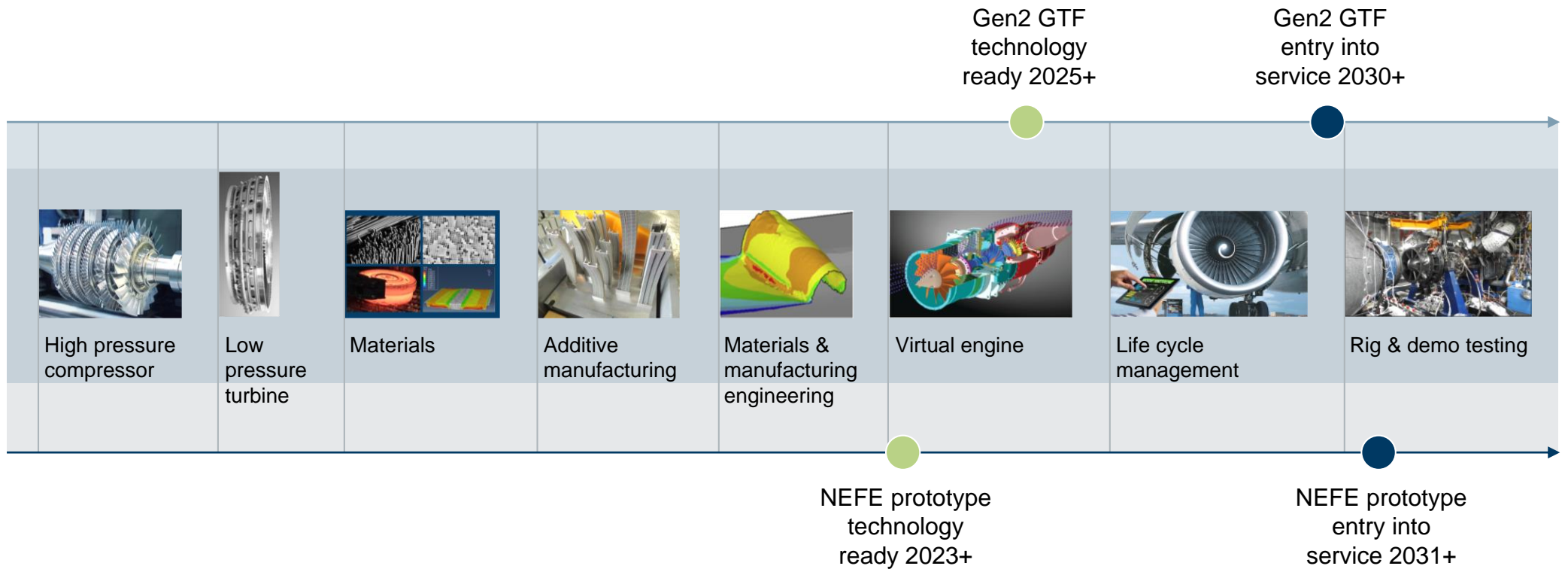
Key synergies: technical, competences and technology funding

Commercial and military technology development

Commercial



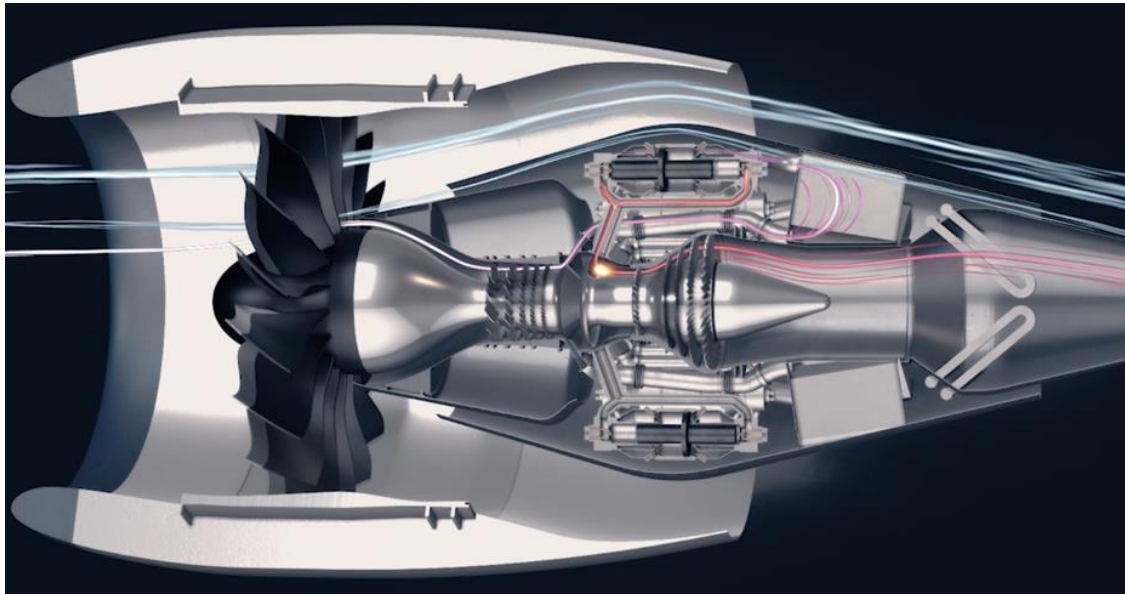
Military



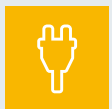
Significant synergies between commercial and military technology development achievable

Revolutionary concepts

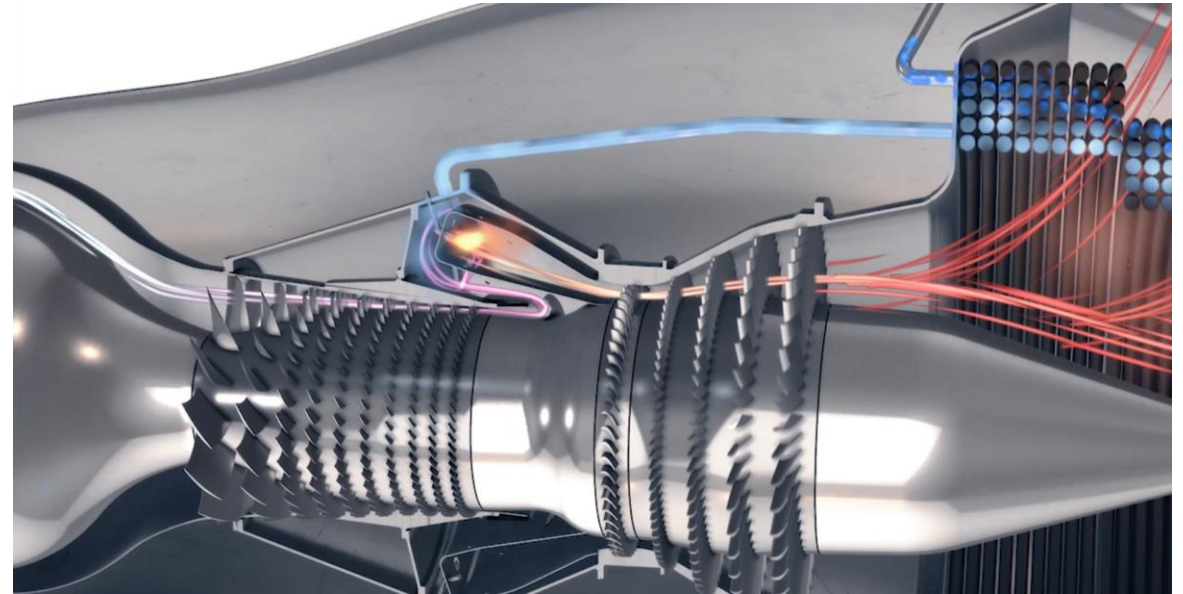
Composite cycle (turbine and piston)



-12% fuel burn



STIG cycle (steam ingestion)

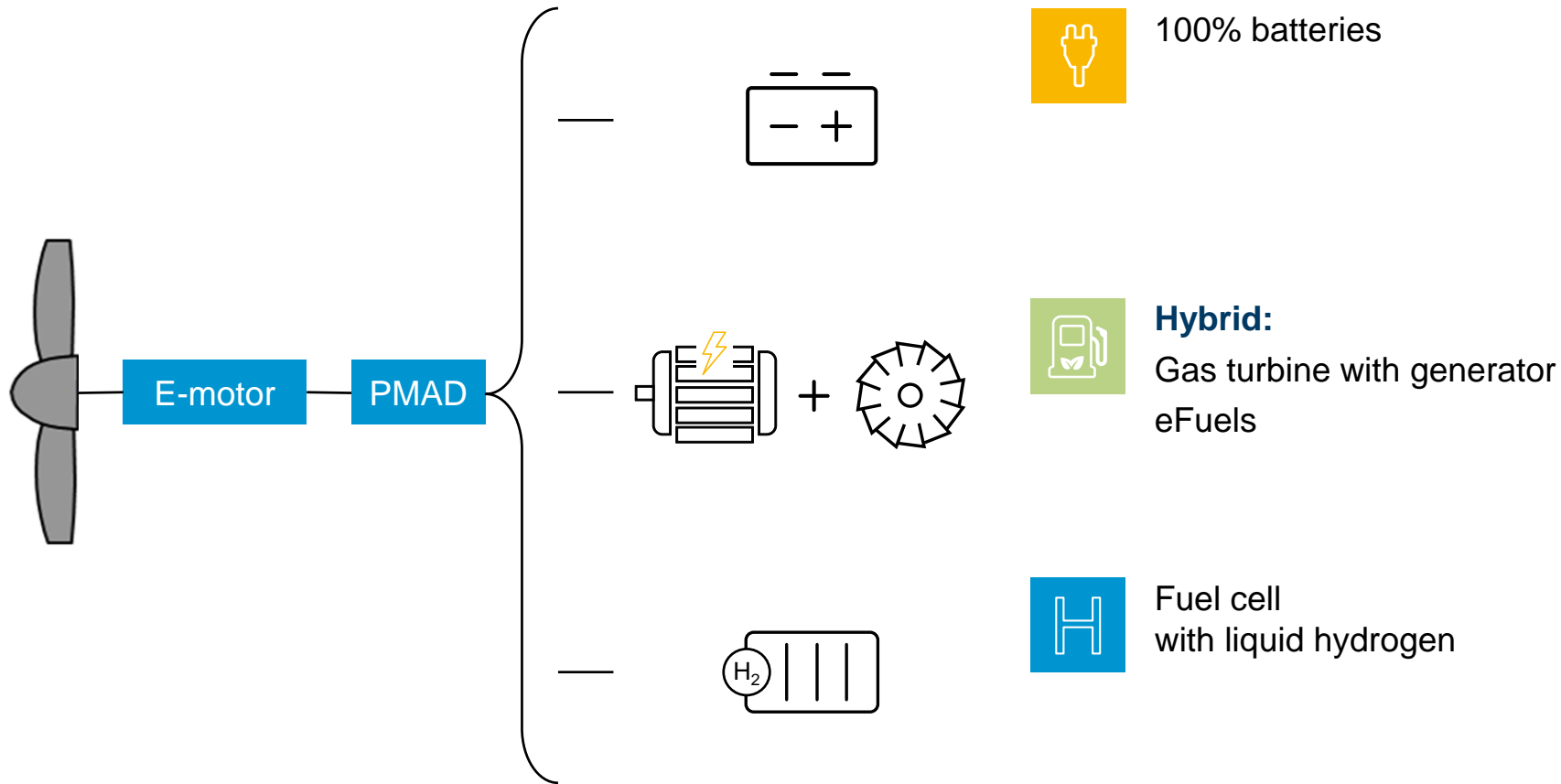


-20% fuel burn



Revolutionary concepts

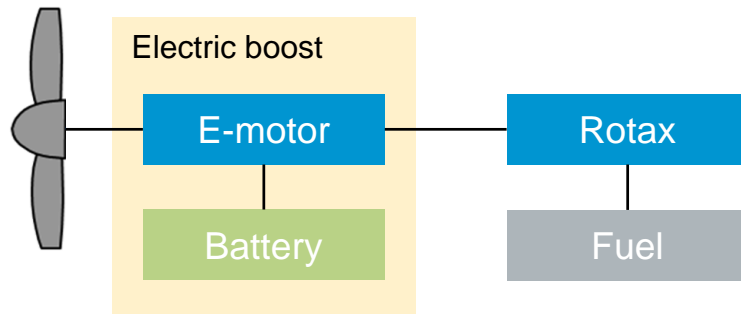
(Hybrid-) electric propulsion



PMAD: power management and distribution

Propulsion concepts for emission free flying

Participation e.SAT (Schematic)



Characteristics

Project plan

- Development of a 5-seat box wing flight taxi
- Electric architecture with ROTAX piston engine
- Low-noise fan

Partners

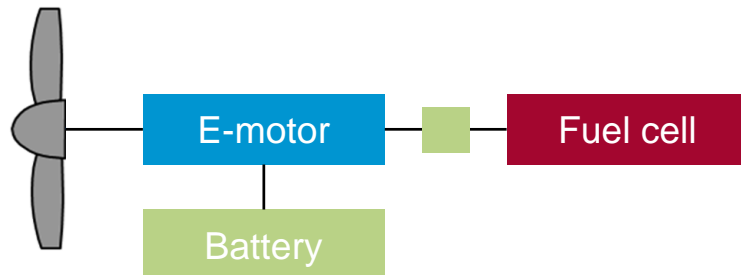
- e.SAT and e.SAT Powertrain GmbH
- RWTH Aachen, MTU, ...

Schedule

- Final design freeze Q1/2021
- Permit to flight Q4/2021
- EIS Q1/2023

Propulsion concepts for emission free flying

Participation DO228hep (Schematic)



Characteristics

Project plan

- Proof of concept for electric propulsion
- Potential integration of fuel cell

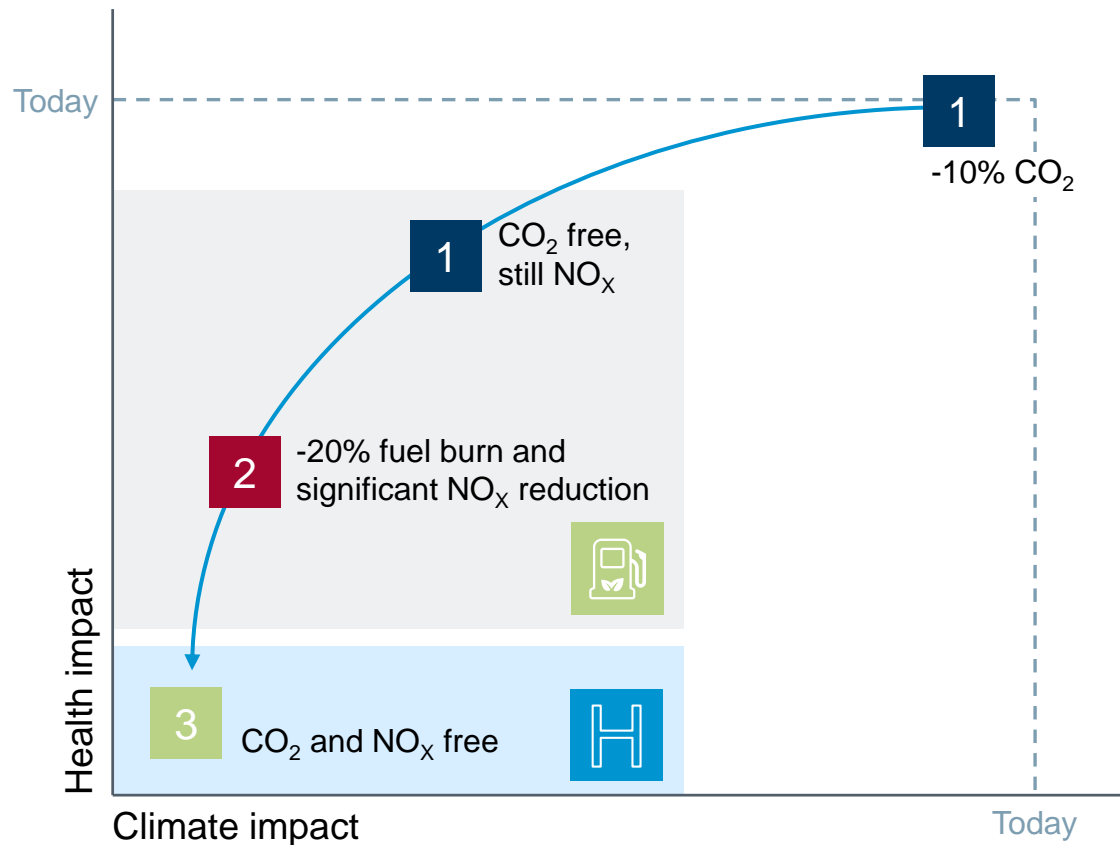
Partners

- DLR

Schedule

- Flight test 2021

Our potential contribution

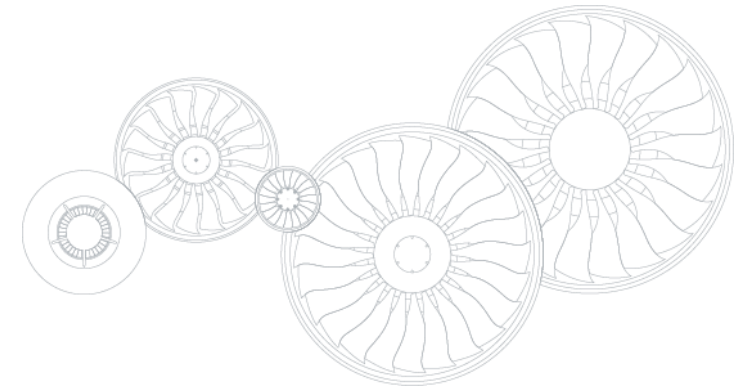


- 1 Next generation GTF**
Low FPR¹, high BPR² and OPR³ as well as lean burn combustor
- 2 Revolutionary engine concepts**
Higher efficiency, reduced NO_x and GHG⁴ (STIG)
- 3 Emission free flying**
Fuel cell with LH₂⁵ (commercial aircrafts) and battery-electric propulsion (small aircraft only)
- Drop-in sustainable aviation fuels SAF⁶**
Renewable and to a large extent CO₂ free (PtL⁷ and StL⁸)
- Liquid hydrogen**

¹ Fan pressure ratio, ² Bypass ratio, ³ Overall pressure ratio, ⁴ Greenhouse gas, ⁵ Liquid hydrogen, ⁶ Sustainable aviation fuels, ⁷ Power to liquid, ⁸ Sun to liquid



Expansion of production facilities

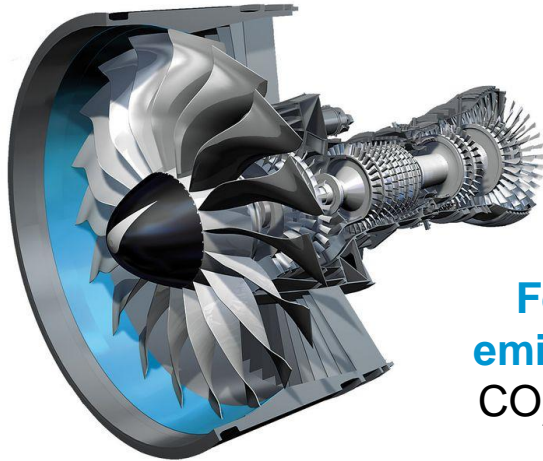


Geared turbofan engines are setting new economical standards – and are a key driver of our production ramp-up

First geared turbofan (GTF) engine generation

~16%
reduction in
fuel burn

~75%
reduction of the
noise footprint



**Fewer
emissions**
CO₂ / NO_x

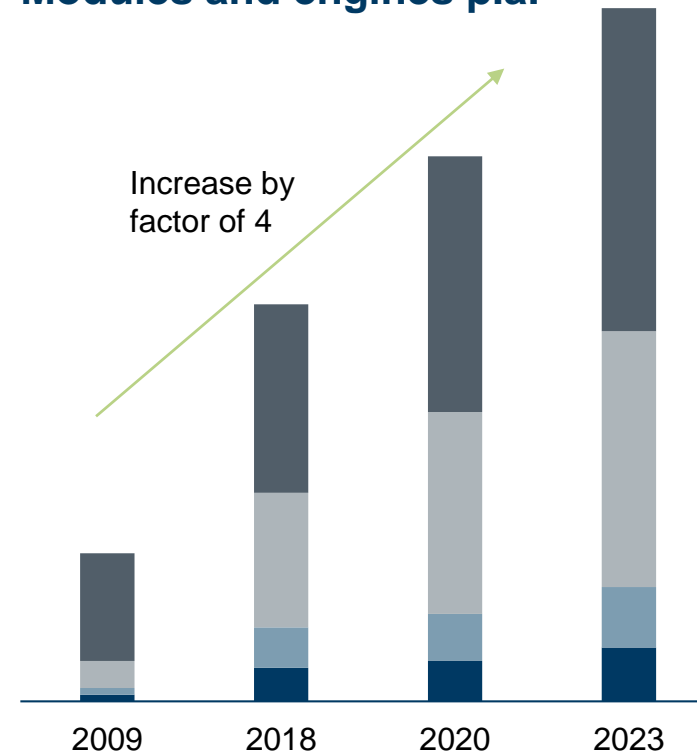
MRO cost savings

25% fewer stages, 45% fewer blades,
lower operating temperature

Source: P&W

Production ramp-up within one decade

Modules and engines p.a.



Low-pressure turbine



High-pressure compressor



Turbine center frame



Engine assembly



Automation in engine manufacturing

Why we constantly increase our level of automation



Reduction of costs

- Increased operating times
- Higher automation level
- Separation of man and machine
- Optimized space utilization



Better process stability and quality

- Less manual interference
- Process data management

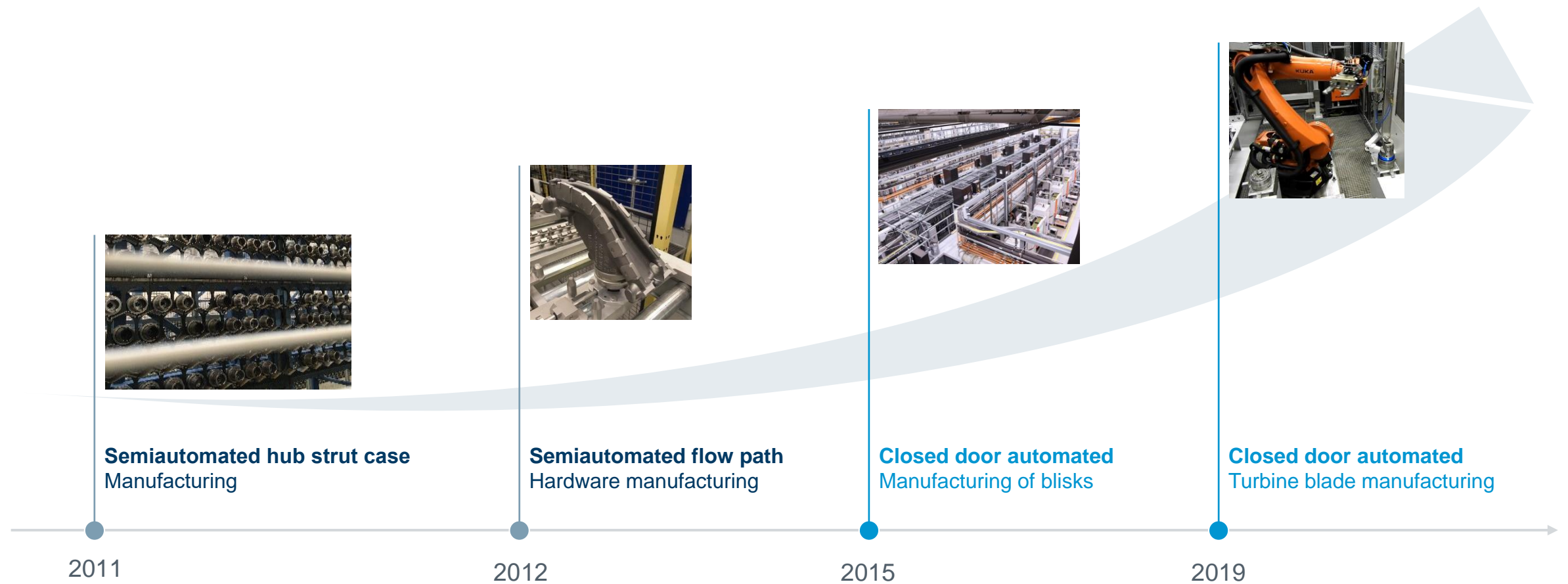


Reduction of turnaround time and working capital

- Fewer workplace rotations
- Fewer interruptions
- Higher transparency and controlling possibilities
- Increased reliability

Utilization of ramp-up

MTU as role model for automation in aero engine manufacturing



Closed door automated manufacturing of blisks

Manufacturing 4.0



Main features

- Fully automated system
- IT-controlled eco-system for autonomous parts and tool flow management
- Production of 4,000 blisks per year



-25%



+40%



-30%

Closed door blade manufacturing

Manufacturing 4.0



-20%



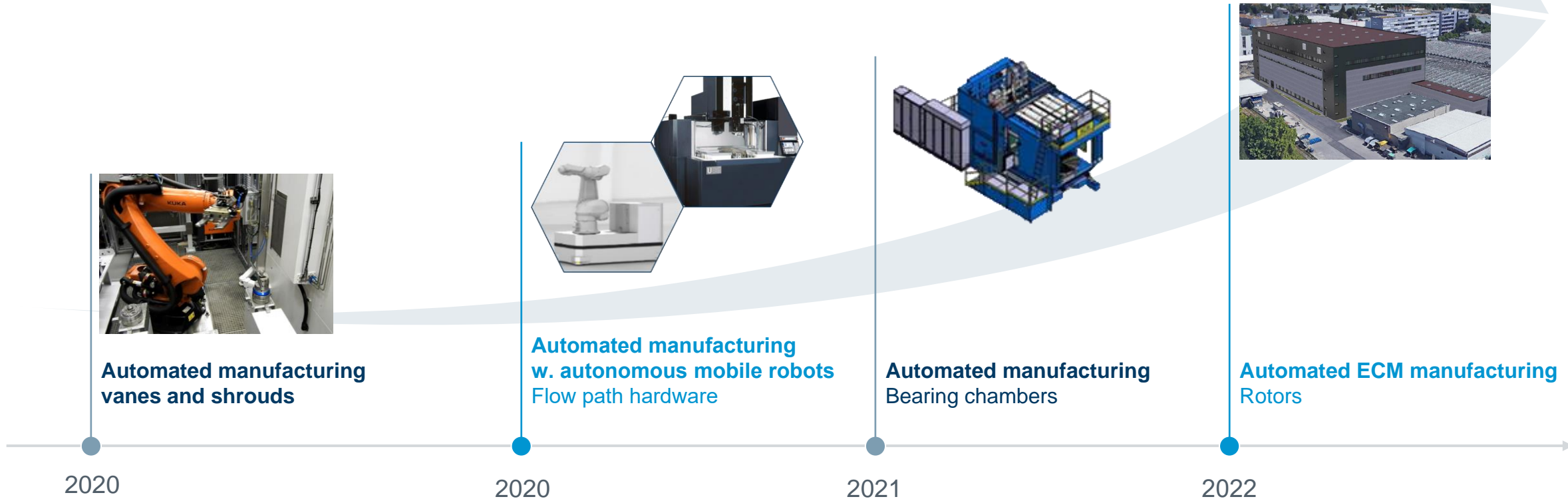
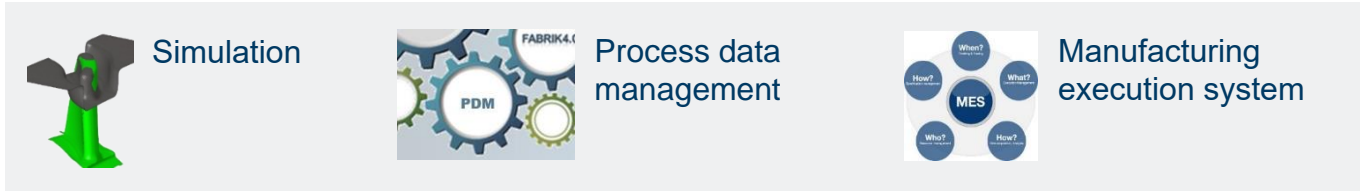
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Main features

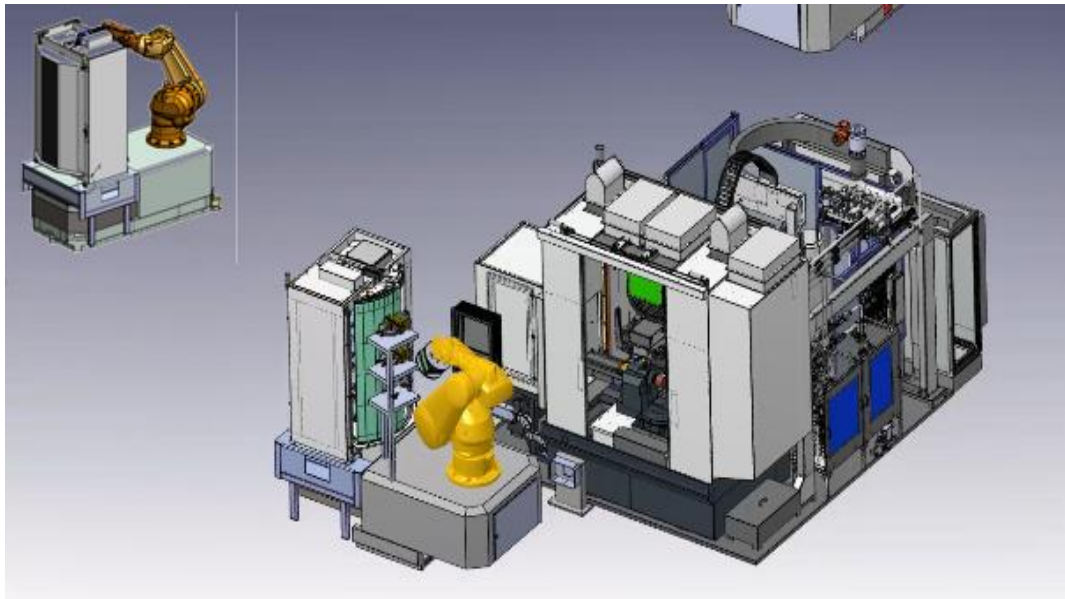
- Fully-automated system
- IT-controlled eco-system for autonomous parts and tools flow management
- Offset correction for individual geometry and adjustment of NC-programs → continual high quality
- Production capacity 7,000 hours per year and machine
- Lot size one

Our next steps in automation



Autonomous mobile robots

Manufacturing 4.0



-30%



+++



-80%

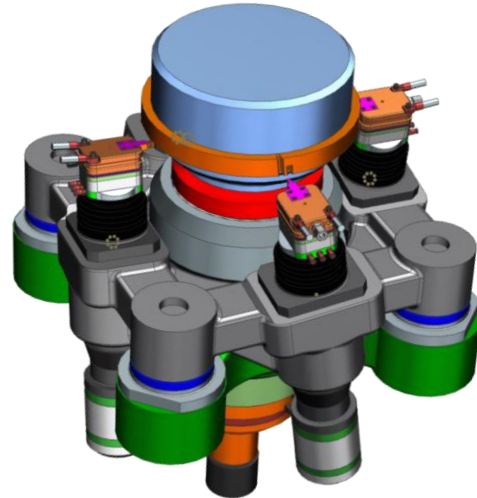


Main features

- Fully-automated system
- Eco-system of freely moving robots for autonomous storage, parts and tool management
- Offset correction for individual geometry and adjustment of NC-programs → continual high quality
- No dedicated storage necessary
- Overall production capacity of 160,000h per year
- Lot size one

Electro chemical machining

Manufacturing 4.0



Main features

- Dissolving material from workpiece by electrochemical process (electrolysis)
- Replacement of two processes (broaching and edge rounding)
- Improved surface quality at lower cost



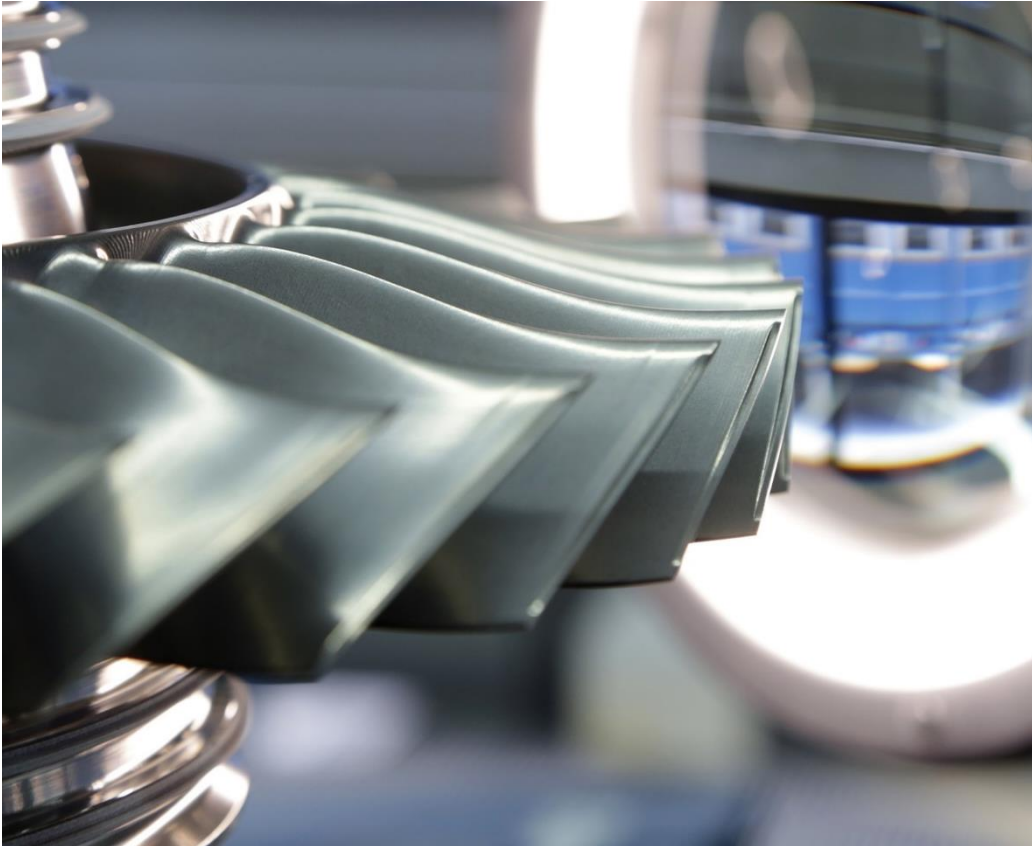
-50%



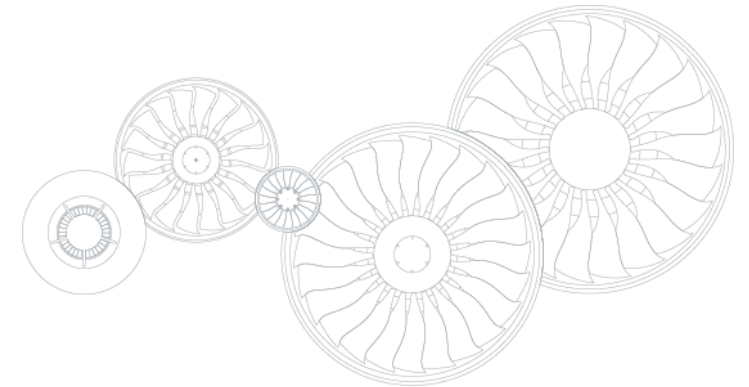
+30%



-20%



Working capital management



Working capital management

MTU established a center of competence for working capital management

Enabler

Flexibility

Response time

Forecast accuracy

Digitalization

Short term: Big data analysis

- Daily visualization on digital dashboards
- Big data analysis of all parameters

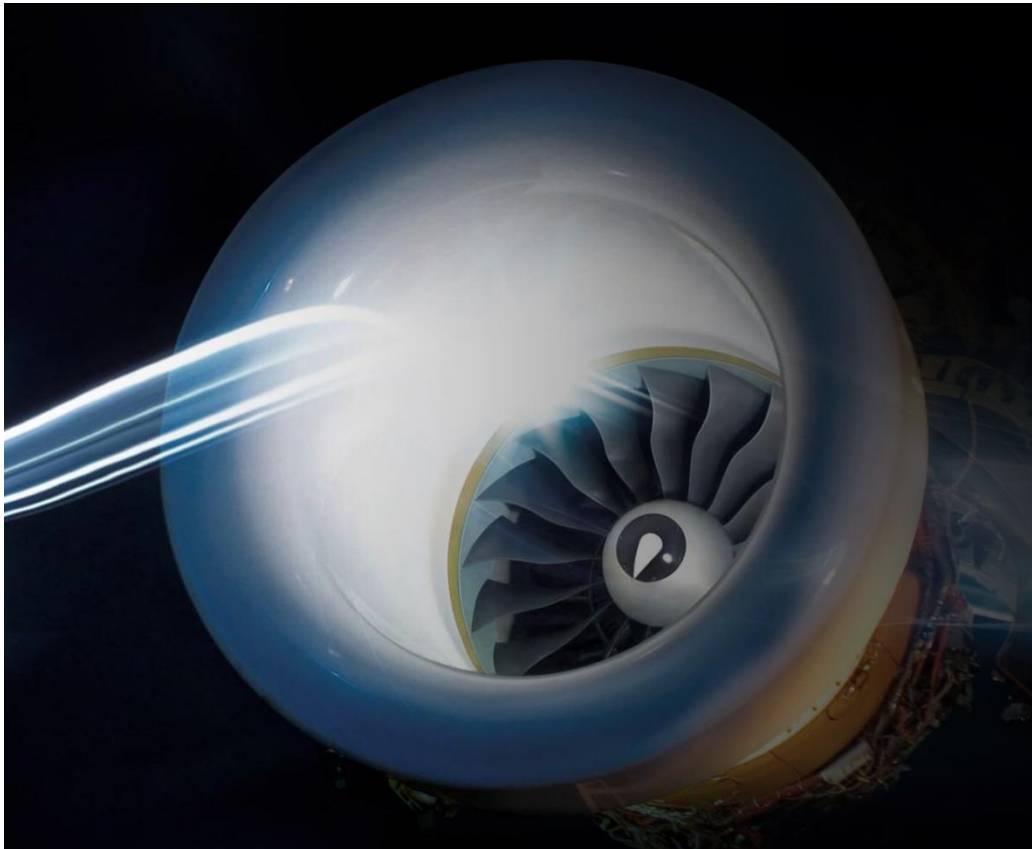
Mid-term: Exception management

- Material management by exception
- Automatically proposed adjustments

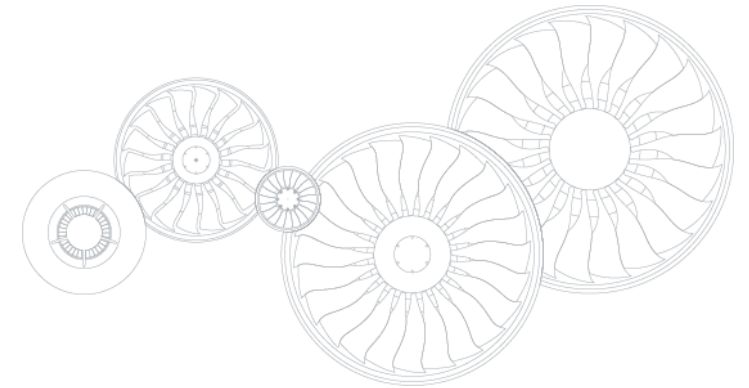
Long-term: AI-disposition

- Pattern recognition and deviation forecast
- Adjustments carried out automatically





Outlook



Outlook



Technology roadmap

- We have **promising** commercial and military **technology** in the pipeline
- **Revolutionary concepts** including **fuel cells** with **(hybrid-)electric** drive train enable **emission reduced/free** flying in the long run



Production extension + automation

- **Automation** and **Industry 4.0** are key to utilizing possibilities in production **ramp-up**
- We will **double** our **automation level** by 2030 to further improve cost efficiency, turnaround time and stability

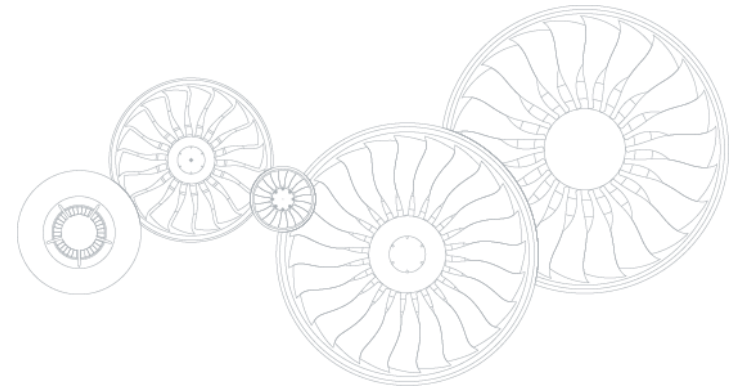


Working capital management

- The newly created **center of excellence** focusses on significant **working capital improvement**
- New **digital tools** support a **50% reduction** in **lead-time** mid-term



Q & A



Lunch Break

Presentation continues at 13:30 CET

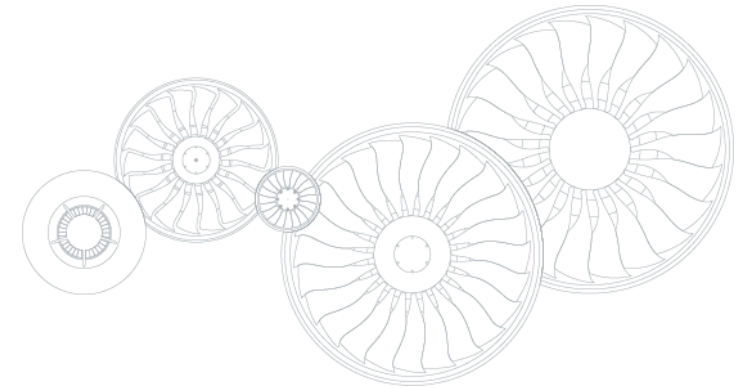


Market success in OEM and MRO businesses

Michael Schreyögg | Chief Program Officer (CPO)



Positive market trends in all business segments



Solid growth in new civil aircraft deliveries over the next 20 years

Positive market environment for the aviation industry



**20-year annual
GDP growth 2.7%**



**20-year annual RPK*
traffic growth 4.5%**



**20-year annual global
fleet growth 3.7%****



**20-year new aircraft
deliveries 46,000****

Solid new aircraft delivery over the next 20 years

**14,500
Business jets**

**6,100
Regional aircraft**

**30,900
Narrowbodies**

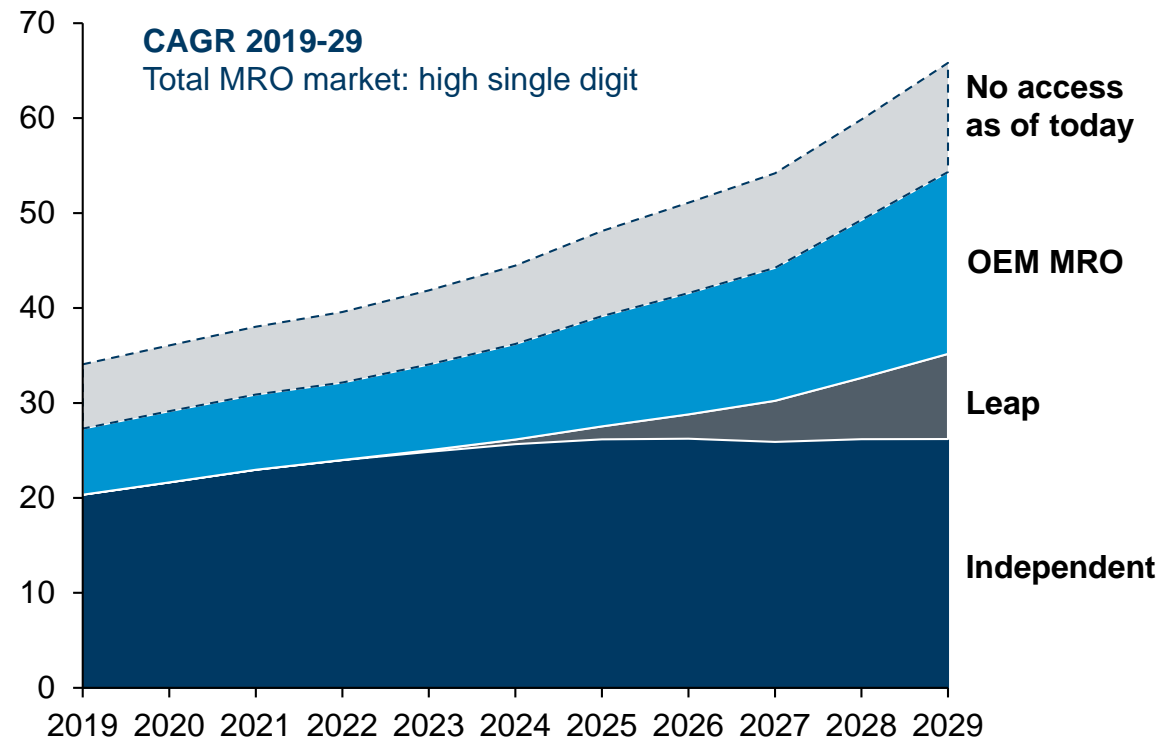
**9,000
Widebodies**

*Revenue passenger kilometres **Total commercial a/c (widebody, narrowbody, regional aircraft)

Total commercial engine MRO revenues will double over the next 10 years

Worldwide MRO market

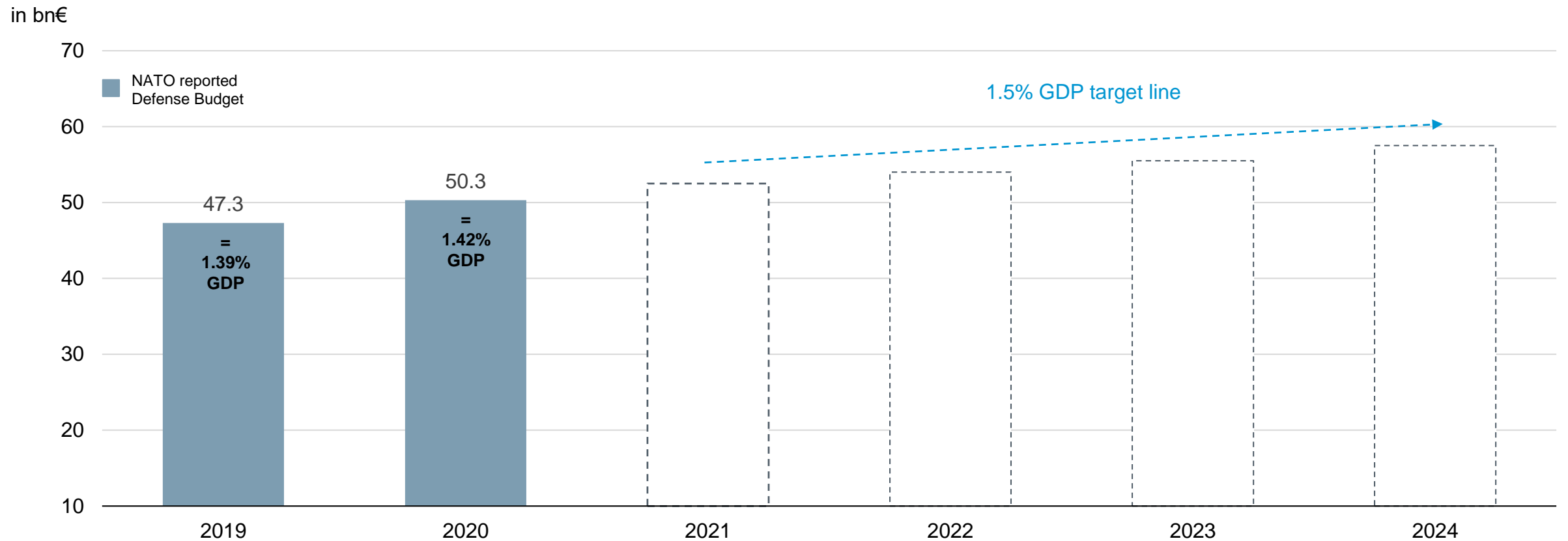
MRO revenues
(in bn US\$)



- Total MRO revenues will grow from ~ US\$ 34 bn today to US\$ 66 bn by 2029
- MTU's MRO market coverage maintains at ~80%
- OEM MRO is growing the strongest driven by new engine platforms

Source: MTU strategic planning 2019 (dynamic), SV for commercial engines (w/o bizjet or military)

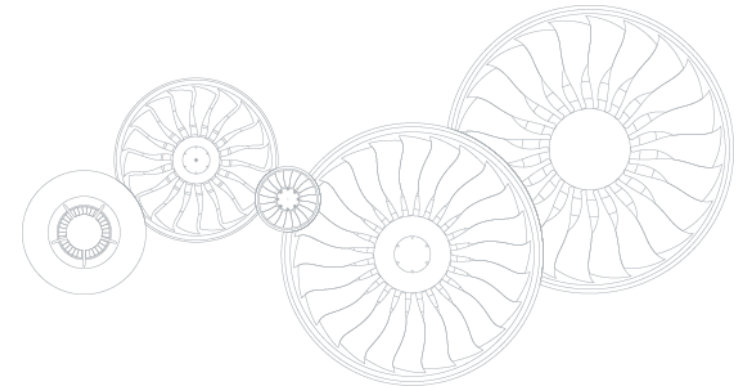
Military outlook – German defense budget expected to increase by 6.2% in 2020, reaching 1.42% of GDP



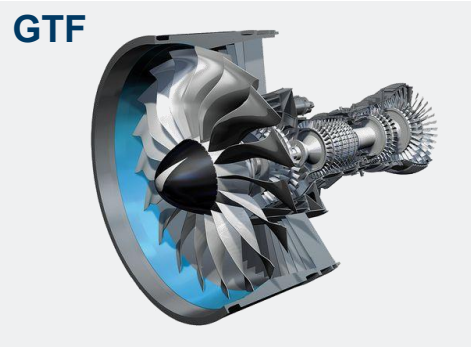
Source: Süddeutsche Zeitung Nov 18, 2019 13:29 Uhr Nato, 2021 – 2024: 1.5% GDP target line – Jane’s Def. Budget Forecast 05/2019; Press release “Zeit online” 10/2019



MTU's key growth drivers



The number of GTF powered aircraft is steadily rising



A320neo
EIS Jan 25, 2016



A220-100
EIS Jul 15, 2016



A220-300
EIS Dec 14, 2016



A321neo
EIS Sep 7, 2017



E190-E2
EIS Apr 24, 2018



E195-E2
EIS Sep 12, 2019

GTF – 10,000 orders and commitments, 80+ customers worldwide, 5 aircraft platforms

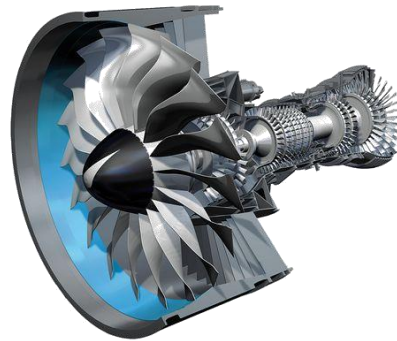


600+ aircraft
in service



40+
operators

GTF



4 million +
flight hours



200 million +
passengers



280 million +
gallons of fuel saved



2.7 million +
metric tonnes of
CO₂ avoided



Up to 75%
smaller noise
footprint

Source: Pratt&Whitney

MTU participates in the large business jet scene – the segment with the strongest growth and the highest revenues in the business jet market



- Gulfstream G500/G600 >10,000 flying hours accumulated
- Mach 0.9 – fastest jets in their category
- Dassault's Falcon 6X EIS expected in 2022
- PW800 engines use common core GTF concept for A220 and Mitsubishi SpaceJet aircraft
- Long and ultra-long range business jet will make up ~ 40% of total business jet deliveries in the next 10 years
- MTU's business jet revenues to triple over the next 10 years

PW800



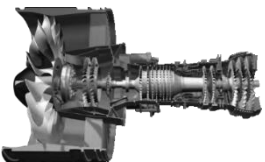
60M US\$ listprice
for large bizjet

The regional jet market will be dominated by the GTF – market share to increase to 90%




- GTF exclusive powerplant for all 3 new RJ platforms
- A220 gained order momentum since Airbus stepped in
- Boeing's 80% stake into Embraer expected for 2020
- Mitsubishi SpaceJet expected to enter into service in 2020

GTF



*incl. firm orders, options, Lols, purchase rights



Total order book of
~ 4,500 engines*

PW1100G-JM powering the A320neo will be the key revenue driver in coming years

Airbus A320neo / PW1100G-JM / EIS 2016

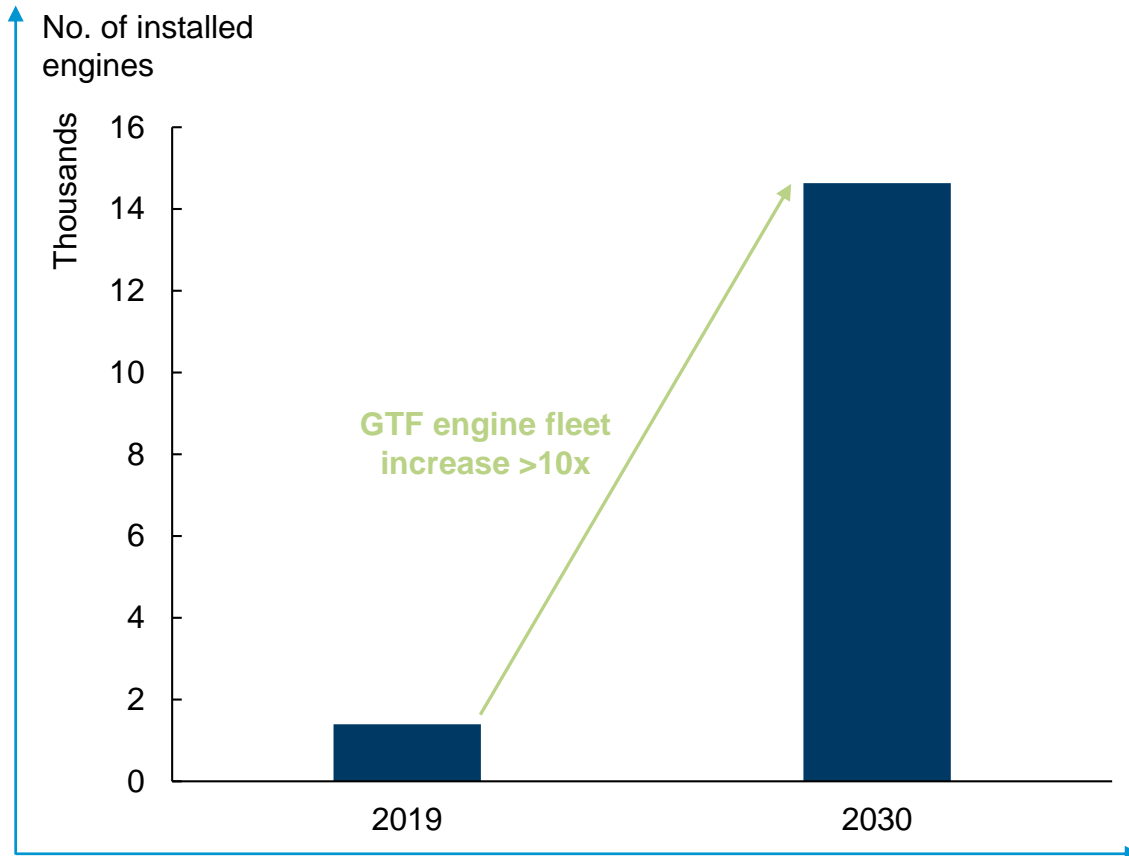


PW1100G-JM



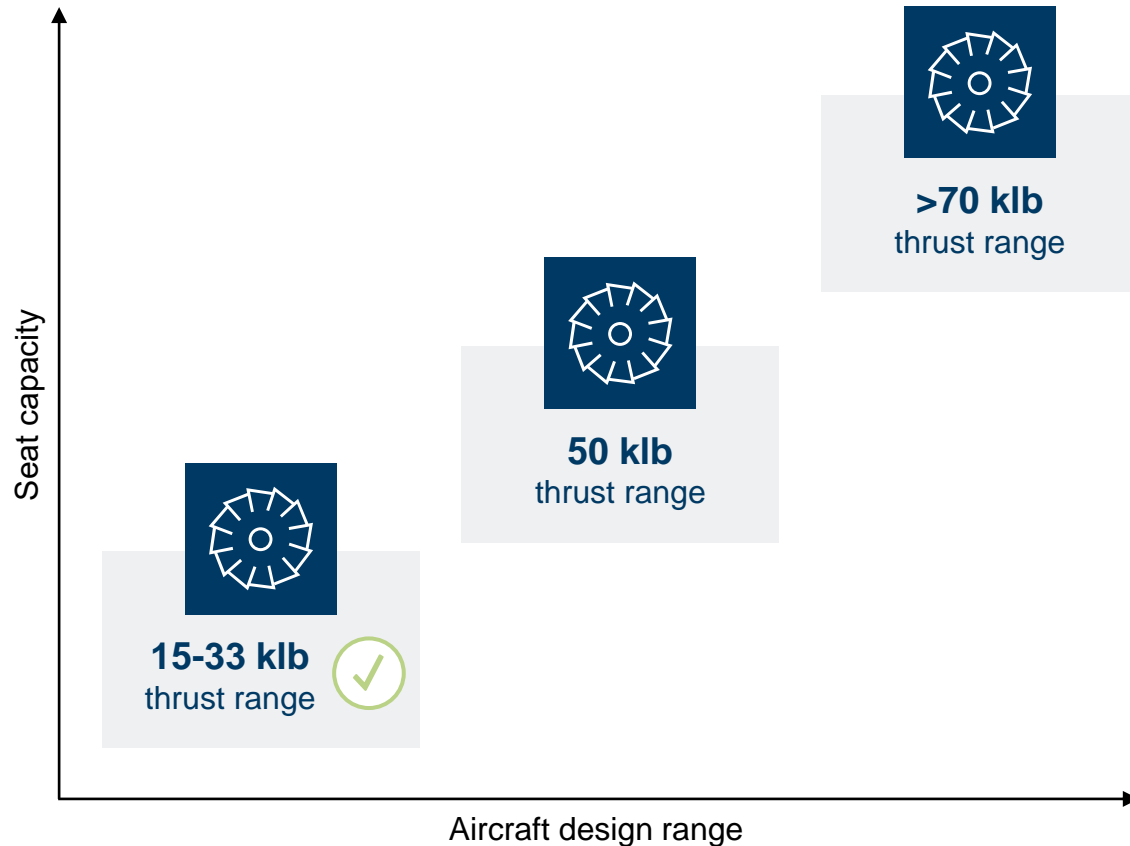
- PW1100G-JM (A320) covers roughly 55% of total GTF order book
- >500 A320neo and A321neo equipped with GTF delivered
- Benefits in fuel, noise and emission proven since 1st flight hour
- Increased thrust level especially beneficial for increased take-off weight A321XLR, available in 2022
- A321LR, XLR have potential to stimulate market demand further


GTF installed base growing – GTF engine fleet to increase to ~ 15.000 in 2030



- Strongest driver is A320neo GTF engine
- Annual production rate at >1,300 GTF engines by the middle of the next decade
- Upside potential from NGSA 2030+

The GTF will lead the industry's engine architecture for the next decades



- GTF concept used on regional and narrowbody platforms 
- Flexibility to be extended to higher thrust levels
- Technology roadmap is in place
- Further innovations and flight experiences makes the GTF a preferred choice for potential new aircraft platforms
- NMA would be a welcome opportunity for scaling up to GTF higher thrust levels
- NGSA requires further efficiencies

GTF industrialization – cost structure optimized and reliable output achieved



Blisk manufacturing, Munich

- High degree of automation
- Production cost optimized
- Annual capa. of 4,000 blisks



MTU Maintenance, Hannover

- PW1100G-JM MRO readiness achieved in 2016



GTF assembly line, Munich

- 30% of all A320neo GTFs
- Output one GTF engine per day



EME Aero, Poland

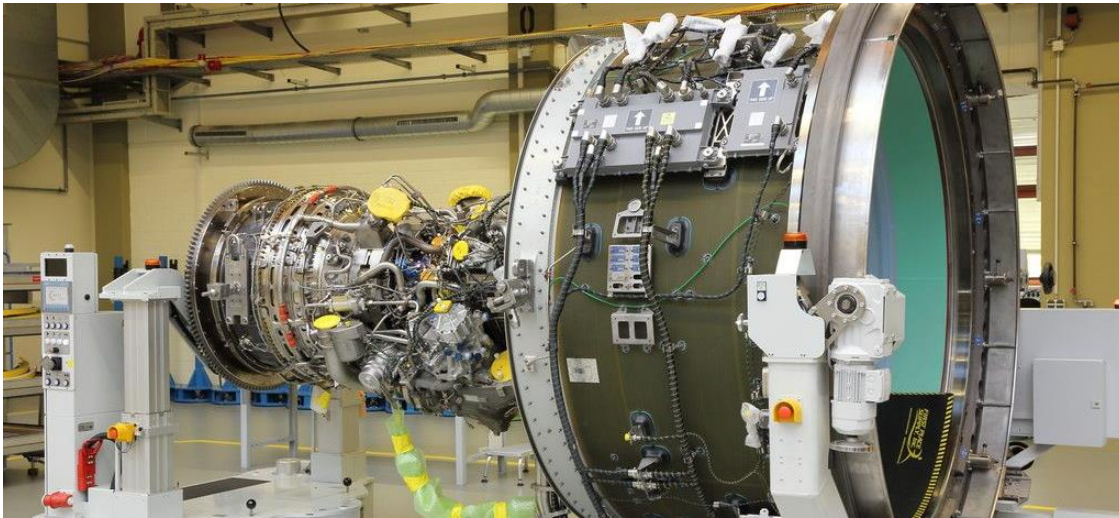
- Most efficient GTF MRO shop worldwide
- Operation start Dec 2019



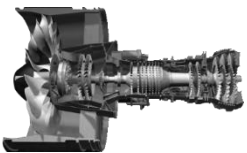
MTU Aero Engines Polska, Poland

- Lower labour cost
- Mid-tech work

Managing GTF challenges requires additional shop visits



PW1100G-JM engine



Limited durability (on-wing time) and technical issues especially under severe environmental conditions (e.g. India)

Nov. 2019: Indian regulator action for GTF engines

- Technical issues have been addressed
- New design available and has been implemented for new engines since Q1 2019
- Retrofit program of the in-service PW1100G-JM engines started mid-2019
- Speed up of retrofit schedule by additional shop visits and spare parts needs

Reliability of GTF continues to improve

EJ200 with attractive national and international growth potential



EJ200



Program highlights:

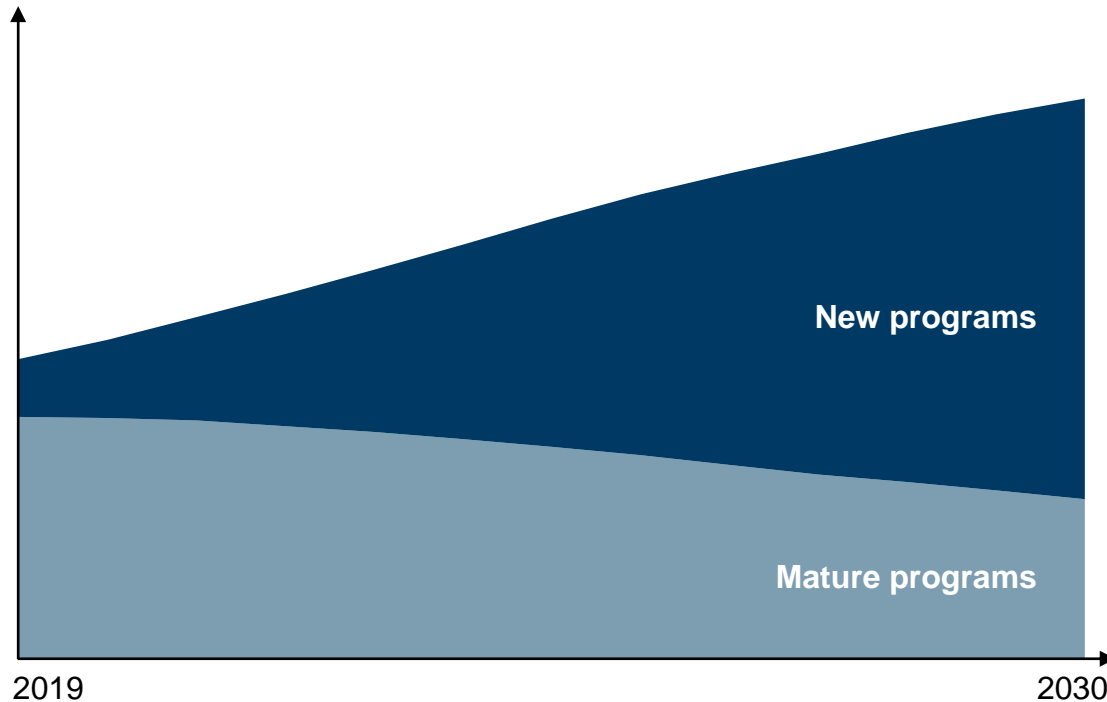
- Over 1,300 EJ200 sold
- >1,000,000 engine flight hours accumulated
- Replacement of tranche 1 → decision expected in 2020
- Replacement of Tornado fleet – competition F/A-18 → decision expected in 2020
- Long-term evolution study started to investigate growth potential of EJ200 engine to fit the requirements of future EF-missions (e.g. as replacement for Tornado)
- Eurofighter (with EJ200 engine) will be a major component in any future European combat air system

EJ200 engine remains key revenue driver

MTU's profitable spare parts business is secured by mature and new engine programs

Unabated flight hour demand secures spare parts revenue growth

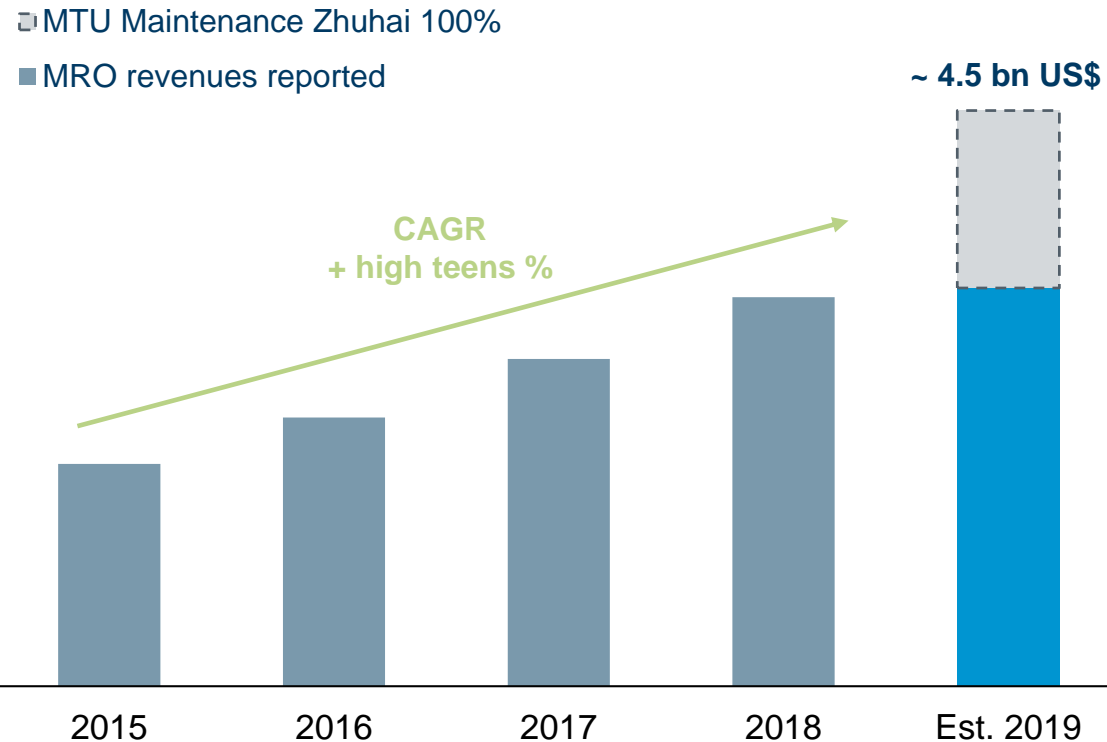
No. of flight hours



- V2500 key spare parts revenue driver with high visibility
- CF6-80C/E – high portion of freighter application will result in solid spare parts contribution
- High visibility of PW2000 aftermarket due to its military and civil application
- GP7000 spare parts secured for next years
- GENx young engine program with a high installed fleet and still growing
- GTF first spare parts expected beginning of 2020; future key revenue driver next to V2500

Long-term growth of spare parts revenue assured

MRO revenues significantly outperformed the market



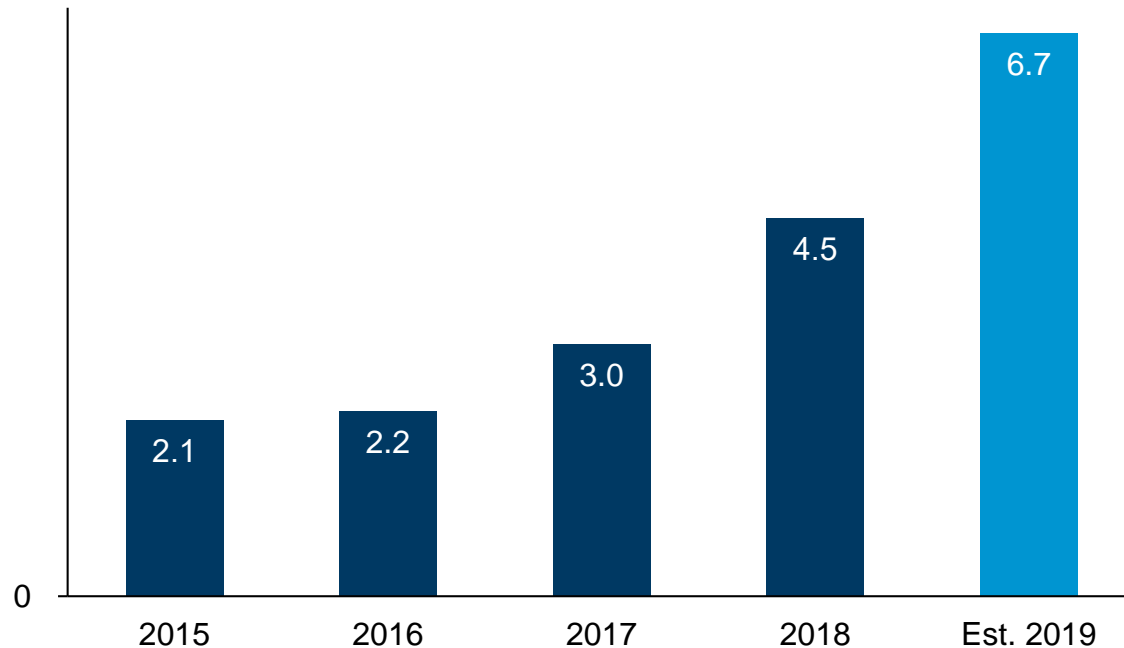
Highlights

- Market approach via independent MRO and OEM-MRO partnerships
- Largest engine maintenance portfolio worldwide
- Broad, diversified customer base
- Strong position in growth platforms
- Current narrowbody engines have not yet reached their shop visit peak
- Future growth mainly driven by new engine platforms

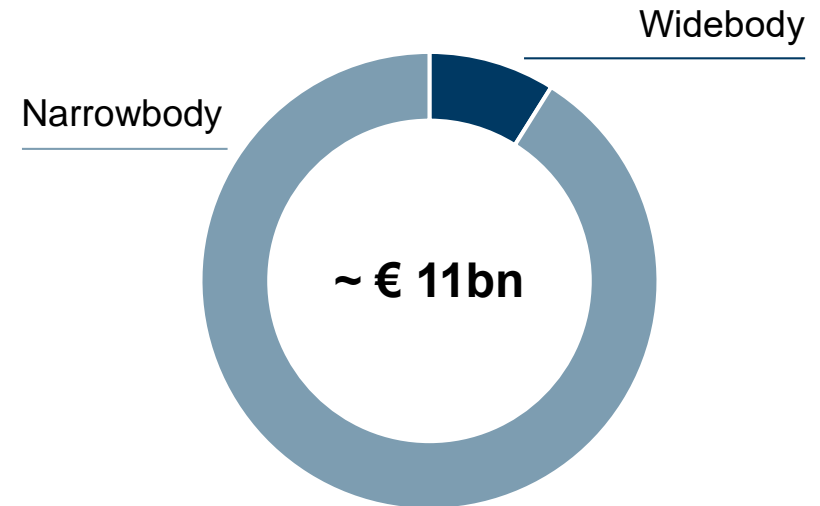
MTU very well positioned to benefit from future growth in the MRO market

Independent MRO and OEM-MRO cooperation are the basis for future growth

Independent MRO campaign wins 2015-2019
(in bn US\$)



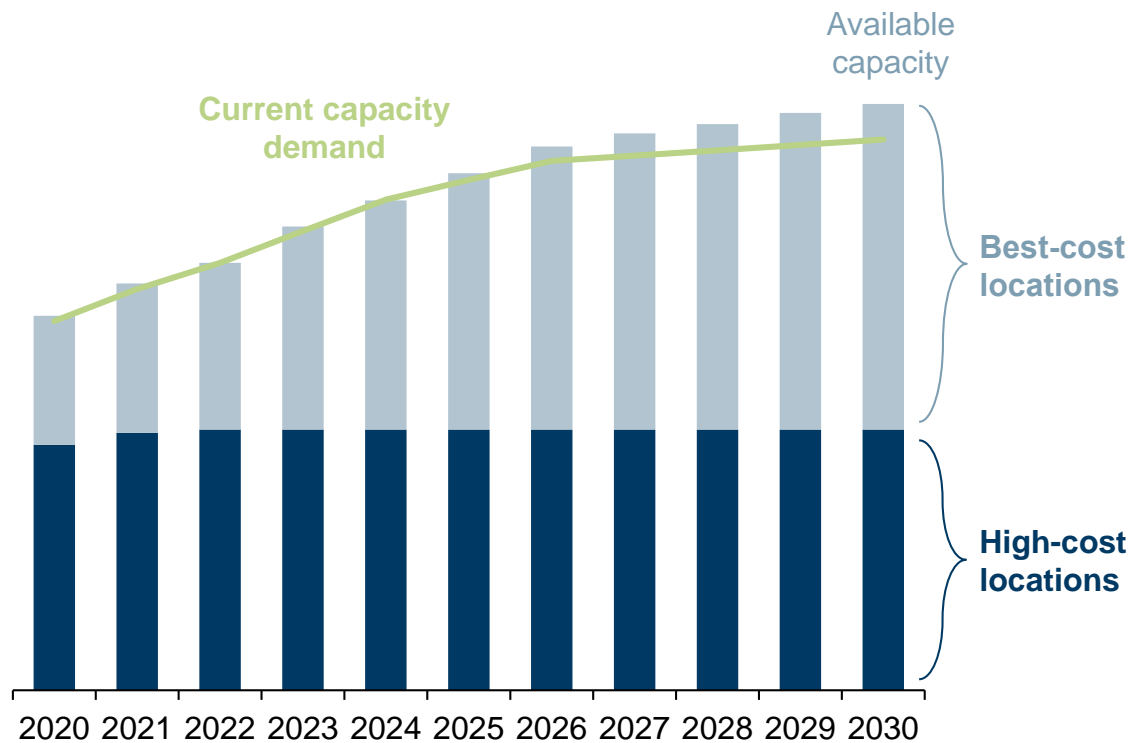
OEM-MRO cooperation order book as of
30th September 2019



Independent MRO business very successful in winning new campaigns
OEM-MRO cooperation secures access to new engine platforms

Increasing demand requires capacity expansion primarily in best cost countries

Capacity demand vs. available capacity



Highlights

- Rising demand for mature and new engine programs
- Short-term: full capacity utilization at existing locations
- Mid to long term: increase capacity and repair capabilities at best cost locations
- Strengthen partnerships with China Southern, Lufthansa Technik

Capacity share in best cost countries will increase from ~30% to ~50%

Key expansion projects support future profitable growth

EME Aero

- Most efficient GTF MRO shop worldwide
- JV with Lufthansa Technik
- Operational begin in Dec 2019



MTU Maintenance Zhuhai

- Prolongation of JV until 2051
- LEAP repair licenses
- 2nd expansion → ~ 450 SV
- Long-term expansion concept under development



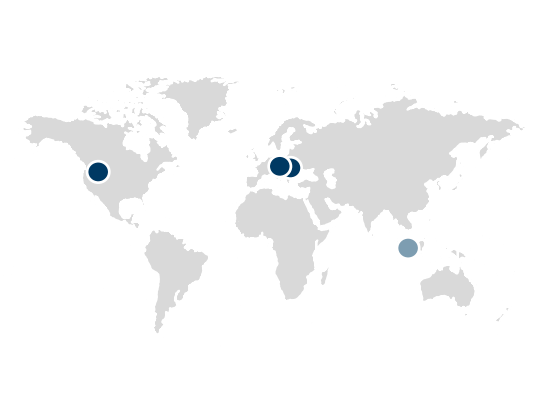
MTU Maintenance Serbia

- New parts repairs shop
- Capacity 400,000 repair hours
- Operational begin 2022



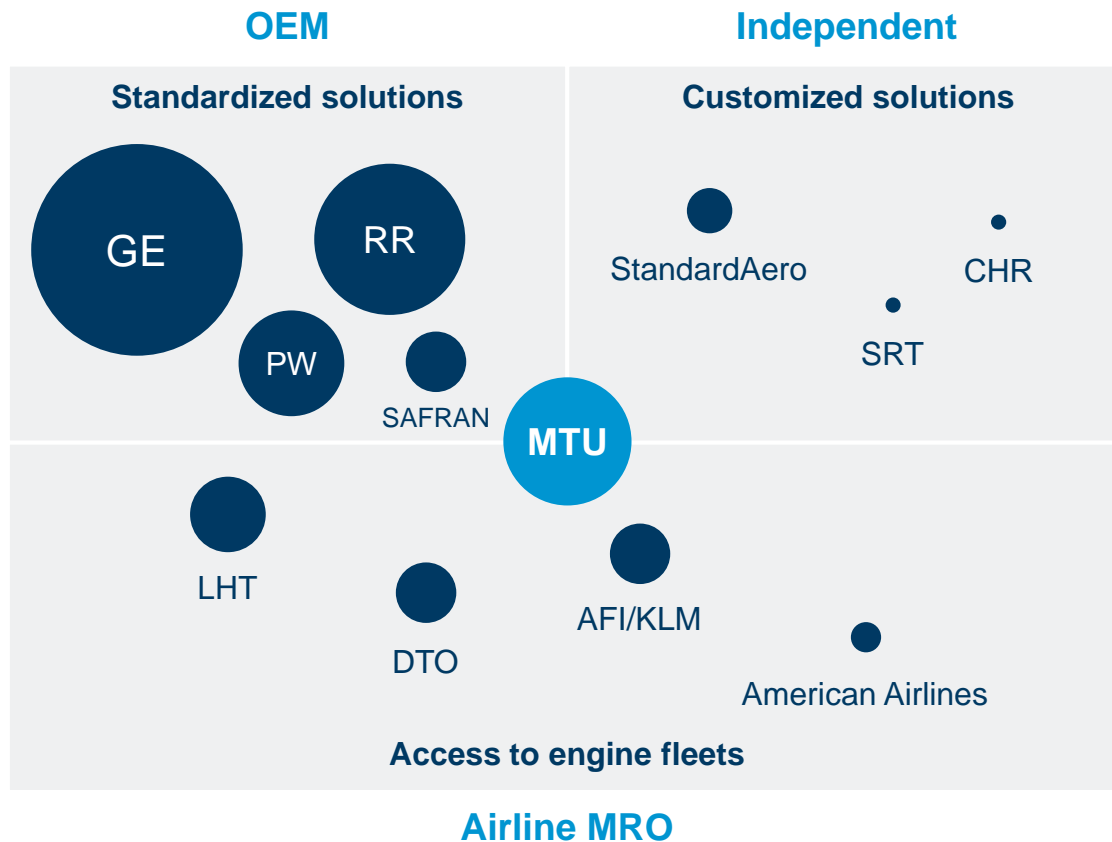
Other MRO expansions

- MTU Maintenance Hannover
- MTU Maintenance Berlin
- ASSB Malaysia
- MTU Maintenance Canada



MTU achieves an advantageous position compared to its competitors by covering all market segments

Competitive MRO landscape



MTU's strengths

- Well positioned in all market segments as a unique selling point
- Technological know-how from the OEM segment creates high level of trust among independent airline customers
- Customized MRO solutions and asset management
- Continuous innovative product and service development
- High quality standards
- Financial strength and willingness to invest in long-term contracts and partnerships

MTU Maintenance offers intelligent solutions over the entire engine lifecycle

PERFORM^{Plus}

New engines

More flight hours at lower cost with customized MRO



MOVE^{Plus}

Sunset engines

Maximized value with effective end-of-life asset management

Mature engines

Reduced cost with smart strategies

Solutions for lessors

Cost-efficient risk mitigation with portable MRO

SAVE^{Plus}

VALUE^{Plus}

Further development of customized solutions strengthens MTU position in the MRO market with strong competitive advantages

MRO technology roadmap focusses on more efficient processes, automation and digitalization in the OEM-MRO and independent MRO businesses

Repair & automation technologies

- Provide essential repair technologies for future products
- Increase degree of shop automation by 20%
- Reduce repair development costs by means of process simulations

Life-cycle management

- Introduce comprehensive on-/near-wing services incl. repairs
- Establish capabilities for target-based workscoping thanks to engine condition monitoring and shop visit data
- Implement process for life-cycle cost management

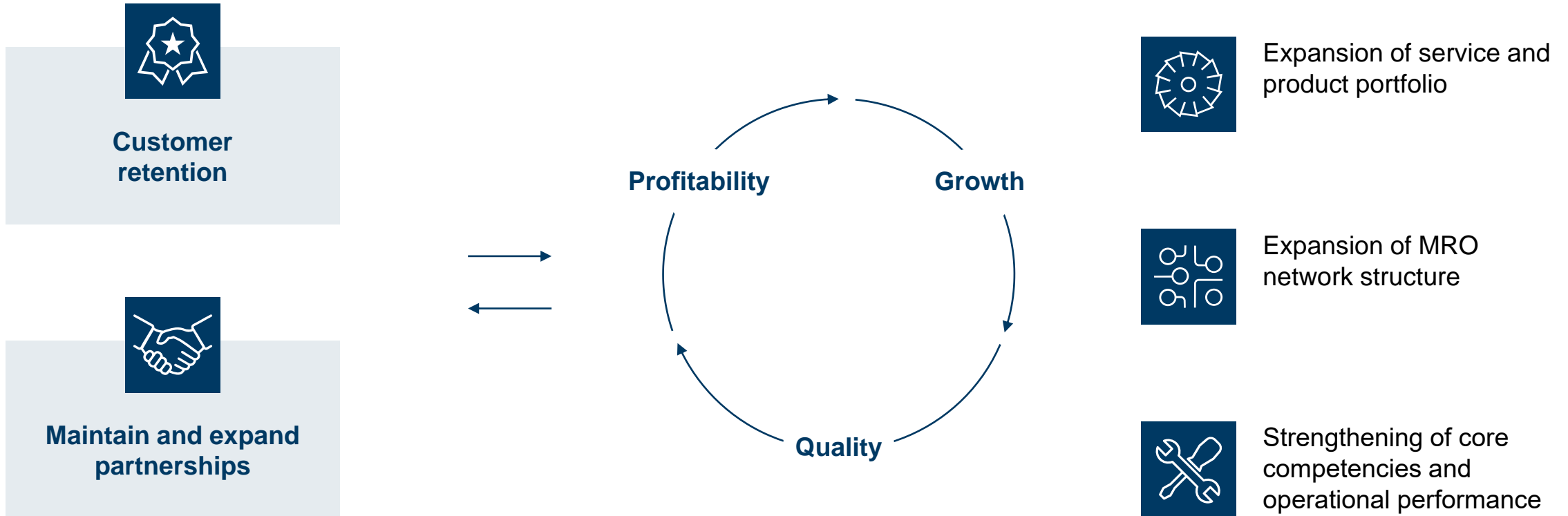
Intelligent MRO processes

- Develop and leverage technologies to foster innovative MRO processes, driven by their impact on value chain
- Collect, produce and treasure smart MRO data as a basis for future developments and improvements



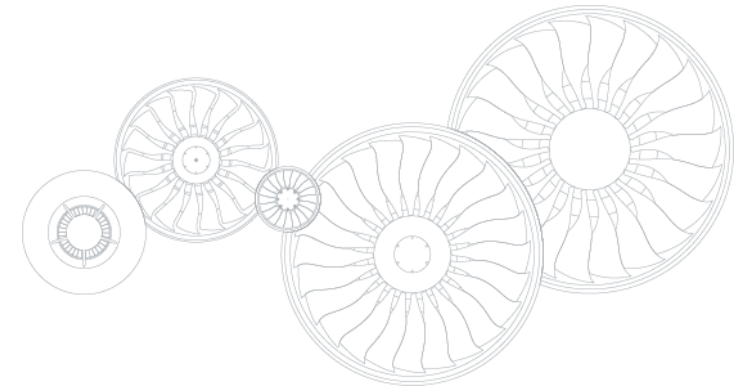
Future profitable growth requires balanced management of operational and strategic aspects

Operational and strategic aspects





Outlook for the next decade



MTU's growth story will continue in the future

Commercial OEM

- 25% program share targeted for the next generation of GTF engines
- Upside potential driven by new aircraft platforms



Military OEM

- Next European Fighter Engine (NEFE) key for future growth
- EJ200 production secured over the next decade



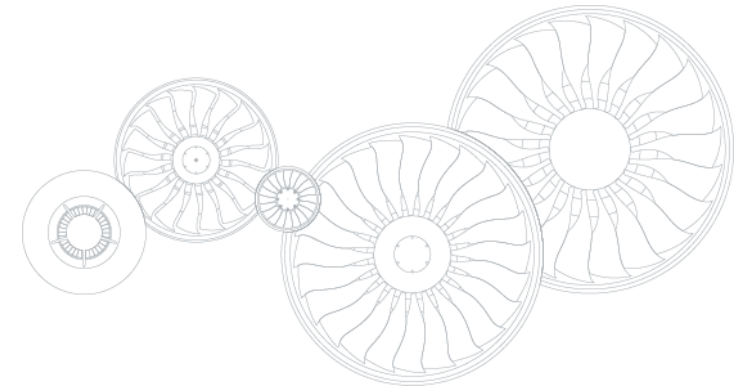
Commercial MRO

- Development of product portfolio
- Active fleet management
- Increase of best cost operations to 50%
- Well positioned in Asia to capture future market growth
- MRO revenues expected to double within the next 10 years





Q & A





Financials

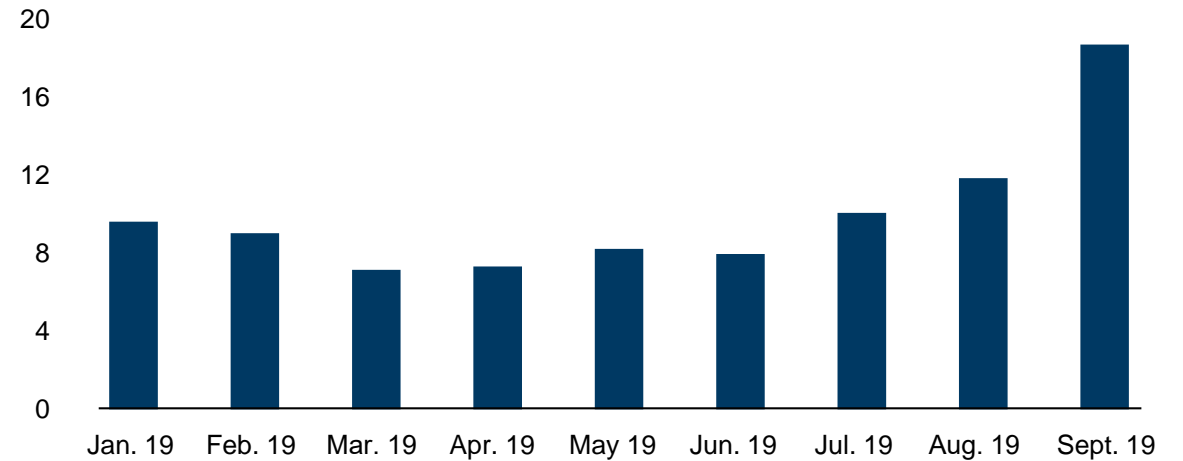
Peter Kameritsch | Chief Financial Officer (CFO) | Chief Information Officer (CIO)

MTU included in german large cap index DAX

MTU share price development [Jan.-Sept. 2019; +53.5%]



MTU trading volume [Jan.-Sept. 2019; in million shares]



AUG 2019

DAX composition was tested end of August

- Rank by Market Capitalization #24 with ~13bn €
- Rank by 12 Month Trading volume was #35

SEPT 2019

On 23 September, MTU replaced ThyssenKrupp in the DAX index

Source: OECD, The Economist intelligence Unit

MTU included in German large cap index DAX



Better reputation

DAX is the German blue chip index

More visibility

- Broader press coverage
- Higher public recognition
- Reputation on labour market

Higher trading volume

- Money in DAX ETFs 10x MDAX
- Money in DAX Futures/Derivatives 40x MDAX
- More active funds with DAX as benchmark

IFRS16 implementation

New IFRS standard for lease contracts

- All lease contracts to be recognized in the balance sheet as right-of-use assets/lease liabilities
- Operating expenses decrease while finance costs increase
- Lease payments to be shown in financing cash flow compared to operating cashflow in IAS17

MTU is impacted by IFRS16 mainly in the following aspects

Engine Leasing
117M €

Real Estate
17M €

others
3M €

Changes through applying IFRS 16 (leases)

Balance sheet as of 01.01.2019

Right-of-use assets/ net-investment +128M €	Equity +1M €
	Lease liability +127M €

Balance sheet as of 30.09.2019

Right-of-use assets/ net-investment +137M €	Equity -8M €
	Lease liability +145M €

P/L 9M2019

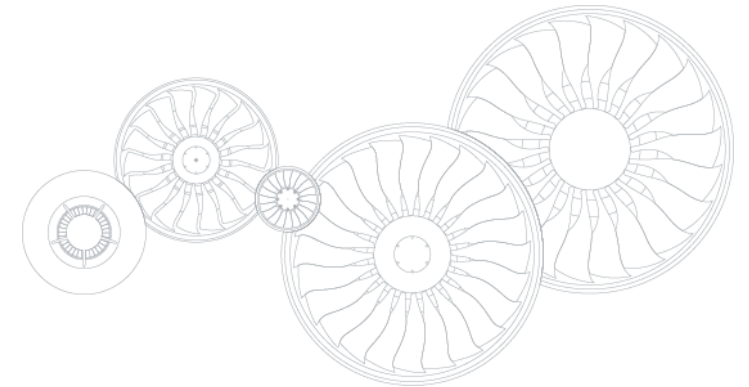
Revenues:	-15M €
EBIT:	+1M €
EBITDA:	+28M €
Financial result: of which FX	-9M € -6M €
P/L Sum	-9M €

Cash flow statement 9M2019

Operating CF:	+29M €
Investing CF:	0M €
FCF:	+29M €
Financing CF	-29M €



Capital structure management



Key capital structure considerations

Position at 30.06.2019

Equity ratio ~30% and 52m shares

Net debt/EBITDA ~ 0.9

Investment grade rating from Fitch (BBB)
and Moody's (Baa3)

Targets

No new equity

Net debt/EBITDA will be in range between 0.5-1.5

Keep investment grade rating

Maintain flexibility for investment in new programs or organic growth opportunities

Increasing shareholder returns

Convertible bond May 2016

1. **Nominal value** 500M €
2. **Maturity** 7 years, May 2023
3. **50% conversion premium** leads to a conversion price of ~125€ per share
4. Possible execution of **Issuer Call** from June 2020



Assessment

- Convert deeply in the money
- Market value at ~ 1bn €
- Nearing date for Issuer Call feature increases risk of early conversions

Risk for dilution of up to 4M Shares

First step

Convertible transaction Sept. 2019

Issue of new convertible bond

1. **Nominal value** 500M €
2. **Maturity** 7.5 years
3. **Issue price** 103% and 0.05% coupon implying -0.34% yield to maturity
4. **55% conversion premium** leads to a conversion price of 378€ per share
5. **Conversions** excluded until September 2024



Market reception

- Orderbook already closed 3 hours after announcement
- Orderbook oversubscribed by factor 2.5
- High quality investors, 55% long-only and 45% hedge funds

**Placement of 500M € convertible bond
in highly favourable market conditions!**

First step

Convertible transaction Sept. 2019

Offer for partial repurchase of convertible bond 2016

1. **Nominal value** up to 275M €
2. **Payment** with proceeds of convertible bond 2019
3. **Repurchase** of ~ 2.2M underlying shares
4. **Offered incentive** in the range of 0.25 to 1.00%



Market reception

- Repurchase offer was well received with orderbook of ~ 400M €
- Assignment based on the lower end of the incentive range at 0.25%
- After initial spike share price reaction neutral

First step

Convertible transaction Sept. 2019

Dilution risk reduced and postponed

Potential conversion
before transaction

Potential conversion
after transaction



Market reception

- Convertible refinancing seen as credit positive by Moody's
- Extension of debt and maturity profile and re-striking seen positively
- Negative yield on new convertibles further strengthens MTUs interest coverage

Conclusion

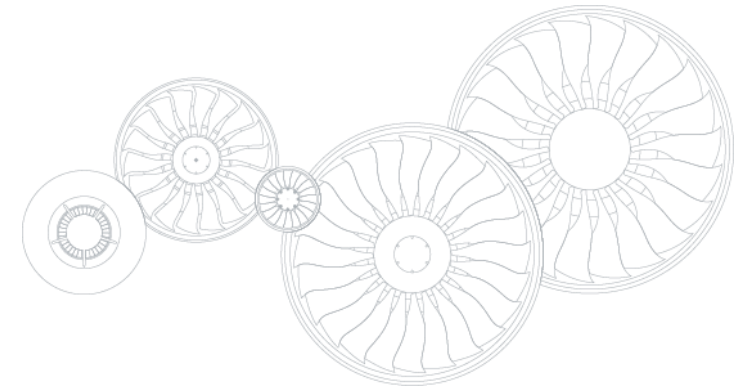
Capital structure management

1. No need for new equity as **FCF further improves**
2. **Management of dilution** remains a key item on the agenda
3. **Dividend payout ratio** towards 40% of net income adjusted
4. MTU has a well **diversified refinancing profile**
5. **Balanced leverage ratio of net debt/EBITDA** around 0.5-1.5 grants flexibility for business development and shareholder returns

MTU's financial strength gives us flexibility for business development opportunities and higher shareholder returns



Guidance 2020



The year 2020

Sustainable growth path confirmed

- Further ramp of GTF volumes
- Ongoing strong growth of aftermarket (Com. Spares & MRO)
- Military business to stabilize on higher level
- Working capital to grow less than revenues



- Total OE losses to stabilize despite continuous ramp-up



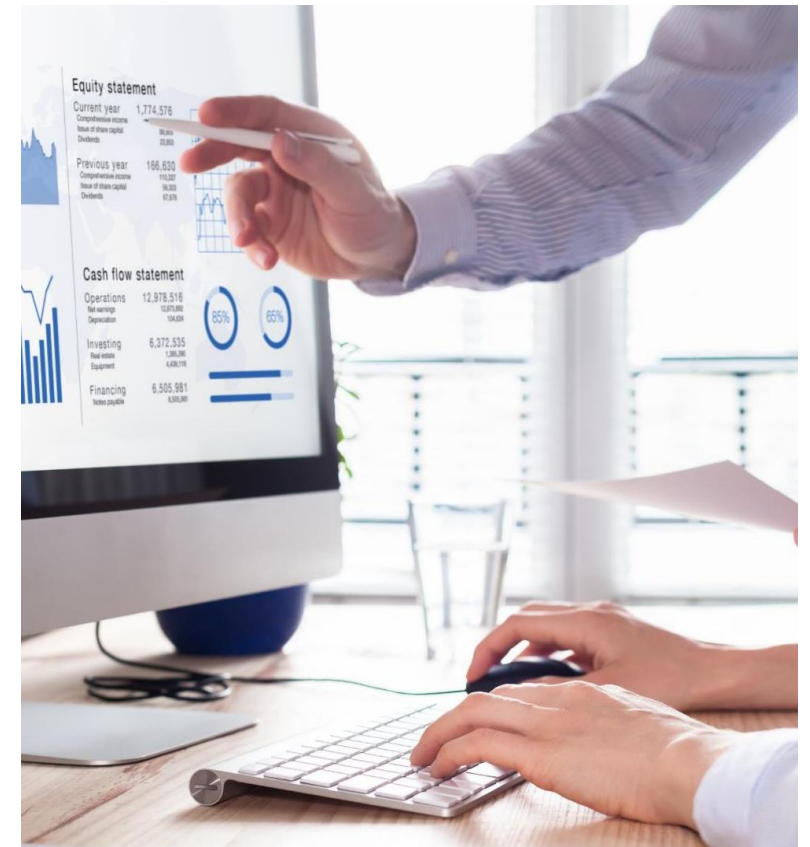
- Investment in efficiency gains and capacity ramp-up in both segments high
- Launch of invest in new parts repair site in Serbia
- Acceleration of GTF Retrofit-SVs



The year 2020: Further growth of EBIT adj. and Free Cashflow

2020 main drivers

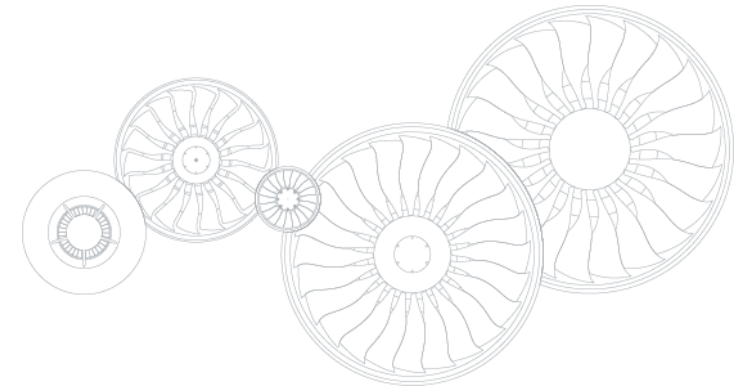
Military	stable	→
Commercial OE	Up high single digit	↑↑
Commercial Spares	Up mid to high single digit	↑↑
Commercial MRO	Core MRO up high single digit Acceleration of GTF-Retrofit program under evaluation	↑↑
EBIT adj.	High single digit growth	
CCR*	~ 70%	

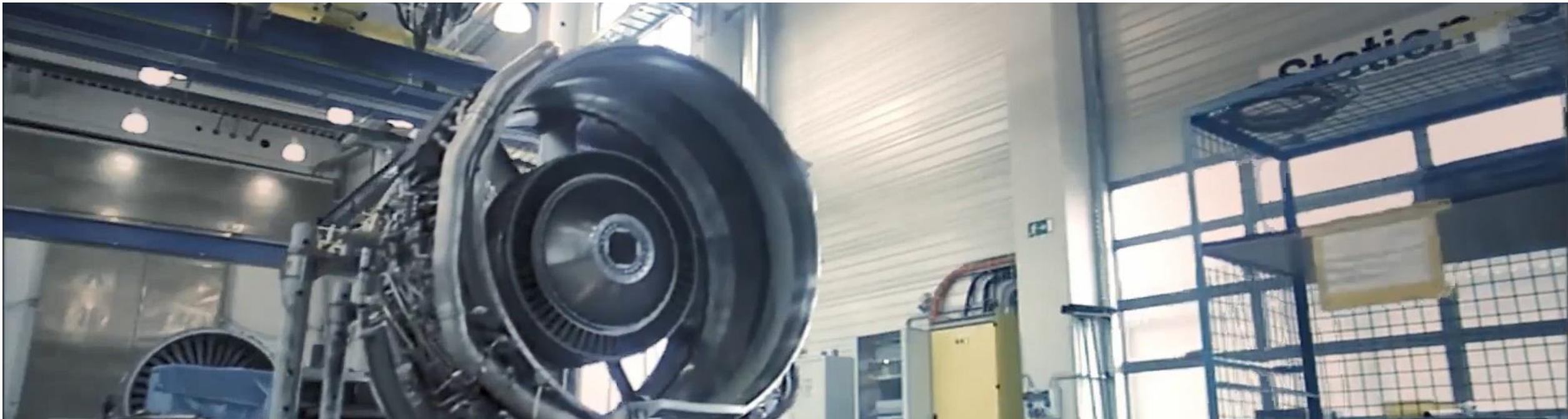


*) Cash Conversion Rate = Free Cashflow/Net Income adj.



Q & A

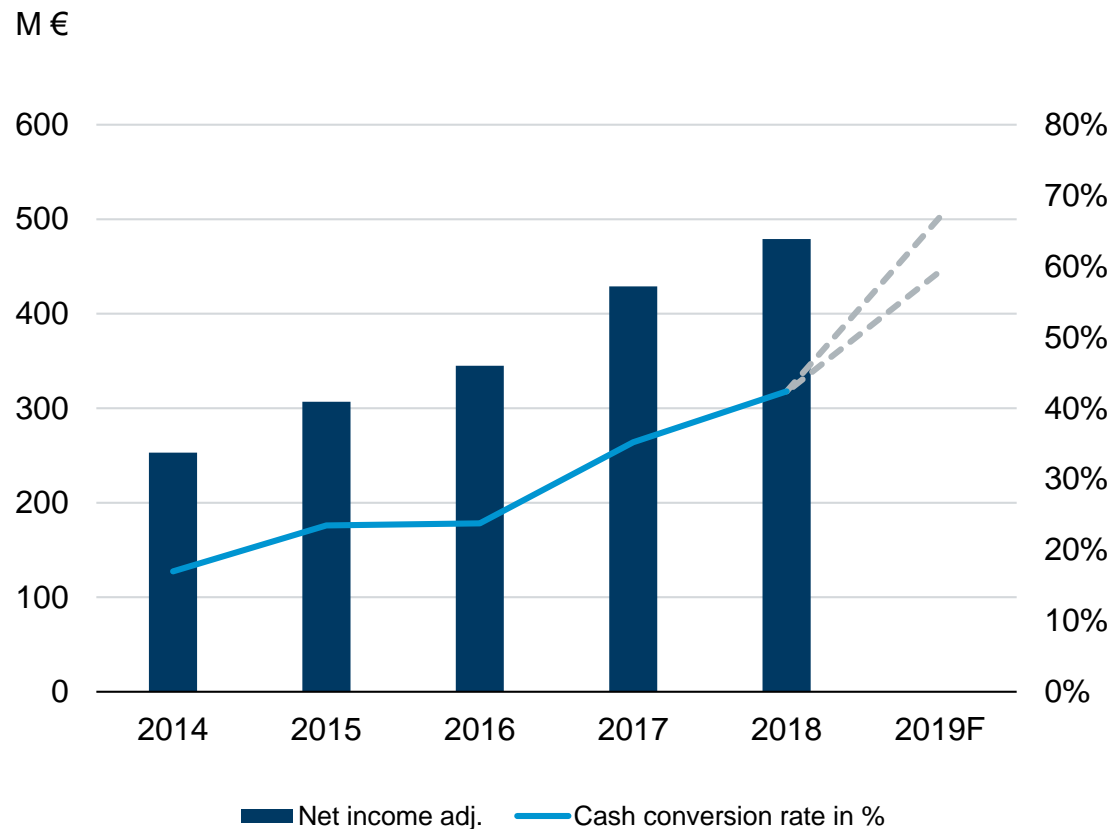




Executive Summary

Reiner Winkler | Chief Executive Officer (CEO)

MTU Aero Engines – lifetime excellence



Broad know-how and portfolio

- 150 technology projects, 400 patents and 200 invention disclosure reports per year
- 30% of aircraft have MTU technology on board

Growing MRO business

- >1,000 shop visits per year for over 30 different engine types

Technological expertise

- Promising commercial and military technology in the pipeline
- Revolutionary concepts including fuel cells enable emission reduced or even emission free flying in the long run

High barriers to entry

- High technology expertise and substantial up-front investment required
- Long term contracts

Long established partnerships

- With all engine OEMs, airlines and the German Air Force
- MTU is an essential partner in the engine value chain

MTU's technological excellence and established partnerships build the foundation for long-term success



“ MTU's financial strength makes it a reliable long-term partner ”

“ MTU has a sound technological basis and provides operational excellence ”

“ Very high level of quality performance ”

“ No need to worry about MTU's delivery performance – allows us to focus on others ”

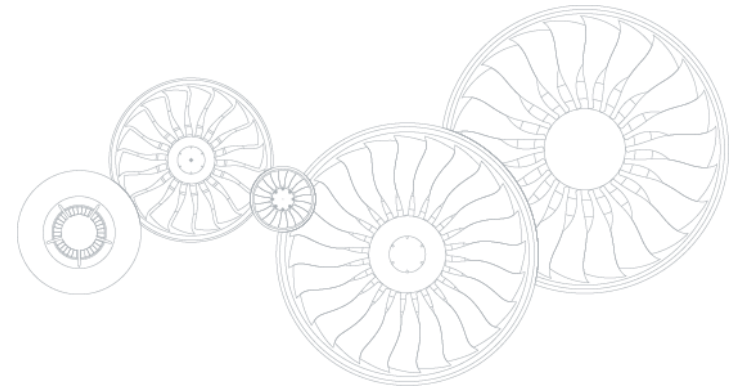
“ Trust, competence and reliability are the attributes that make MTU essential for the German Airforce ”

MTUs road into the 2020s

1	Continued huge demand drives new engine deliveries	<ul style="list-style-type: none"> • GTF delivers game-changing economic and environmental performance • GTF engine fleet to increase to 15,000 in 2030
2	MTU's expected ongoing engine fleet utilization secures aftermarket	<ul style="list-style-type: none"> • V2500s peak still ahead • New programs accelerating into early 2020s
3	Leading German and European industry partner in defence	<ul style="list-style-type: none"> • NEFE secures long-term growth
4	Key expansion projects support profitable MRO growth in future	<ul style="list-style-type: none"> • Customer focused approach secures strong independent business growth • New engine access secured by OEM-MRO cooperation • MRO revenues to double in 10 years
5	Clear strategy towards a Clean Air Engine	<ul style="list-style-type: none"> • GTF Gen2 concept for 2030+ • Revolutionary concepts • Concepts for emission free flying
6	MTU's financial strength grants flexibility for business development and shareholder returns	<ul style="list-style-type: none"> • 30%+ equity ratio • Well-diversified refinancing profile



Q & A





Thank you!

Cautionary Note Regarding Forward-Looking Statements

Certain of the statements contained herein may be statements of future expectations and other forward-looking statements that are based on management's current views and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in such statements. In addition to statements that are forward-looking by reason of context, the words "may," "will," "should," "expect," "plan," "intend," "anticipate," "forecast," "believe," "estimate," "predict," "potential," or "continue" and similar expressions identify forward-looking statements.

Actual results, performance or events may differ materially from those in such statements due to, without limitation, (i) competition from other companies in MTU's industry and MTU's ability to retain or increase its market share, (ii) MTU's reliance on certain customers for its sales, (iii) risks related to MTU's participation in consortia and risk and revenue sharing agreements for new aero engine programs, (iv) the impact of non-compete provisions included in certain of MTU's contracts, (v) the impact of a decline in German or other European defense budgets or changes in funding priorities for military aircraft, (vi) risks associated with government funding, (vii) the impact of significant disruptions in MTU's supply from key vendors, (viii) the continued success of MTU's research and development initiatives, (ix) currency exchange rate fluctuations, (x) changes in tax legislation, (xi) the impact of any product liability claims, (xii) MTU's ability to comply with regulations affecting its business and its ability to respond to changes in the regulatory environment, (xiii) the cyclical nature of the airline industry and the current financial difficulties of commercial airlines, (xiv) our substantial leverage and (xv) general local and global economic conditions. Many of these factors may be more likely to occur, or more pronounced, as a result of terrorist activities and their consequences.

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