



The Power of Flight

2019 Paris Air Show

June 15, 2019

CFM International Media Briefing

Today's speakers



Sébastien Imbourg

Executive Vice President
CFM International



Gaël Méheust

President and CEO
CFM International



Allen Paxson

Executive Vice President
CFM International

An extraordinary achievement ...



Thanks...

...a billion.

CFM56 engines are a remarkable blend of technology and craftsmanship. With these engines, our 600+ operators around the globe have achieved something extraordinary: one billion engine flight hours. Together, we have changed the world. Thank you.

www.cfmaeroengines.com

CFM International is a 50/50 joint company between GE and Safran Aircraft Engines

Extraordinary together



Industry is still strong...



Consumers will still spend 1% of GDP on air travel...

\$899 billion



Revenue Passenger Kilometers forecasted to grow

5%



Average load factor is at a record high, above

80%



On watch ...

Fuel costs... ~25% of op cost

Trade tariffs... impact on cargo

~\$28*
BILLION
AIRLINE NET
PROFIT
PROJECTED FOR
2019

**Source: IATA June 2019 Economic Forecast*



Backlog is solid... 7+ years of production



15,500+ engines total backlog (CFM56 & LEAP)



17,600+ total LEAP orders/commitments (w./spares)



\$8.7
billion U.S. value at list price



LEAP production on schedule at Airbus & Boeing...



MET PRODUCTION TARGET AGAIN IN 2018...
... AND FINISHED ANOTHER RECORD YEAR



2,100+ total

engines planned by year end 2019

→ **1,800+ LEAP** engines

→ **380+ CFM56** engines



**...uninterrupted
deliveries since April 2016**

LEAP fleet in service... nearly **5 million** engine flight hours

LEAP-1A

EIS AUGUST 2016

1.5+ million cycles

3.1+ million flight hours

44 operators

10+ hours average per day

433 aircraft in service



96%
Flown Days

**UTILIZATION
ADVANTAGE:**

6%

Fleet statistics are for engines



LEAP-1B

EIS MAY 2017

617,000+ cycles

1.8+ million flight hours

60 operators

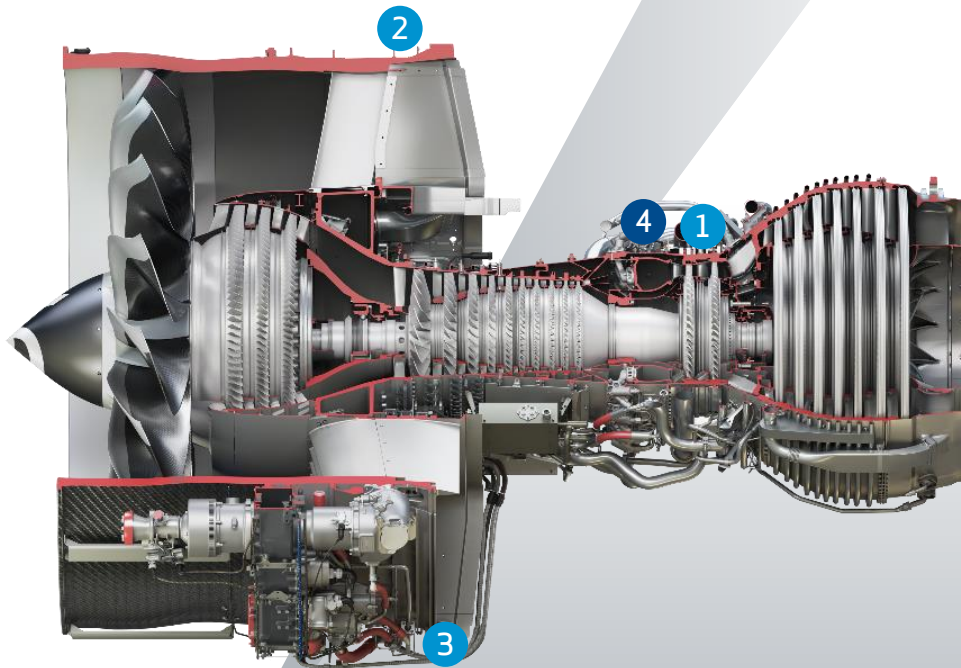
10+ hours average per day

389 aircraft in service

Update on LEAP Fleet ...



- ✓ LEAP-1A Starter Air Valve
- ✓ LEAP-1B LPT disk
- ✓ LEAP-1A HPT Stage 2 Disk
- ① LEAP-1A/-1B HPT Thermal Barrier Coating Loss
- ② LEAP-1A/-1B Fuel leaks
- ③ LEAP-1B Radial Drive Shaft
- ④ LEAP-1A / -1B Fuel Nozzle carbon build-up



Boeing 737 MAX Return to Service...

Taking a two-phased approach to supporting customers

Proactive Maintenance:



- Proper preservation
- Completing time-sensitive tasks
- Pulling forward planned maintenance

Return to Service:



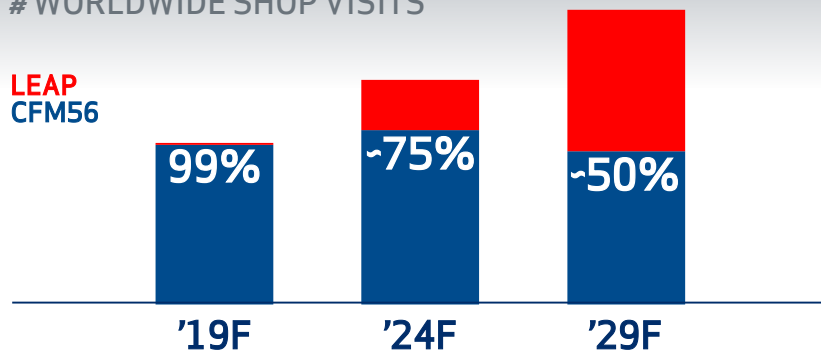
- Performing de-preservation
- Validate data links
- Complete return to service check list



...now we're focused on CFM Services & Support

WORLDWIDE SHOP VISITS

LEAP
CFM56



+38,000 CFM engines in service in 2025

60% of CFM56 w/ **no SV**; **30%** one SV only

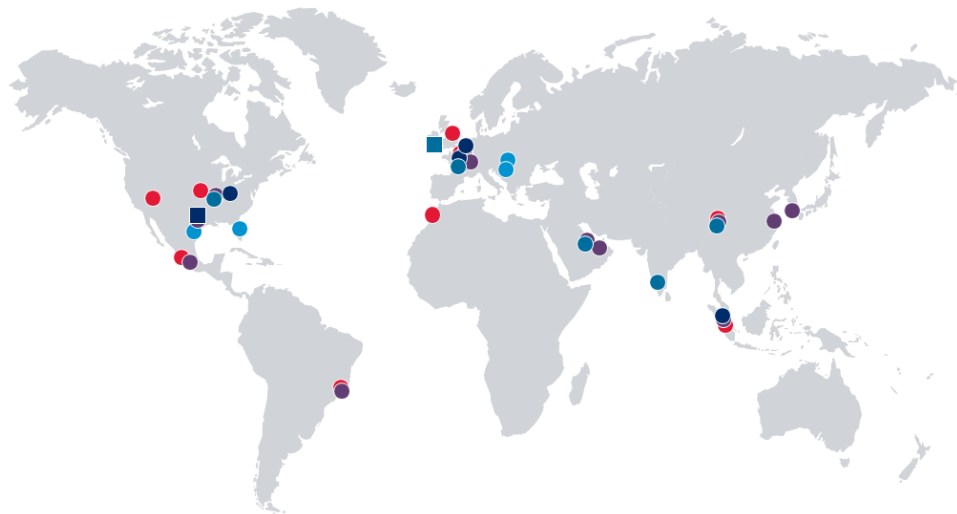
Peak CFM56 shop visits at **3,000+**

1,000 LEAP SV projected around 2025

Open MRO model ... based on CFM56

18 CFM MRO sites by year-end

More third-party shop being added



Technology roadmap ... ready for the future



Aerodynamics

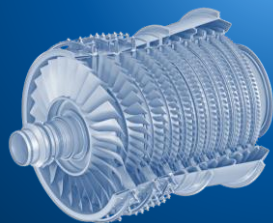
Highest compressive ratio & lowest fan blade count

Compressive efficiency

22:1

HP Compression Ratio

18^{Fan}
Blades



Materials

Ceramics, Carbon Fiber, Additive, Powder Metal, TiAl

Light weight, high temperature, durable

1/3

Weight

HPT Shroud

2x

Strength

Turbine Nozzle

20%

Less Cooling



Architecture

Conventional, unconventional, ducted, and unducted

Aircraft integration, reliability & efficiency

~10% lower fuel burn



~15% lower fuel burn

Hybrid Electric



The LEAP engine... delivering what we promised



ENVIRONMENTAL PERFORMANCE



Lower noise & emissions



15+% better fuel
efficiency

BEST-IN-CLASS ASSET UTILIZATION



Product reliability



Predictive
maintenance



World-class support

PRODUCTION



On schedule



Robust Supply Chain

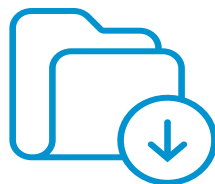
In the media...



Access to photos, releases, and this presentation



<https://www.cfmaeroengines.com/parisairshow-2019-downloads/>





Thank you!

cfmaeroengines.com/parisairshow-2019

CFM agreement with IATA; open, competitive MRO model



Addresses **concerns** expressed by airlines on CFM aftermarket policies

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Primary outcome is improved **transparency** and assurance of non-discrimination

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Agreement signed July 31, 2018, effective February 28, 2019

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Scope includes: commercial and technical support policies etc.

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Reinforces CFM's differentiation as **open/competitive** MRO support model



The Power of Flight