2025 Fleet & MRO Forecast

Asia Pacific Focus | AWIN Market Analysis

Preliminary

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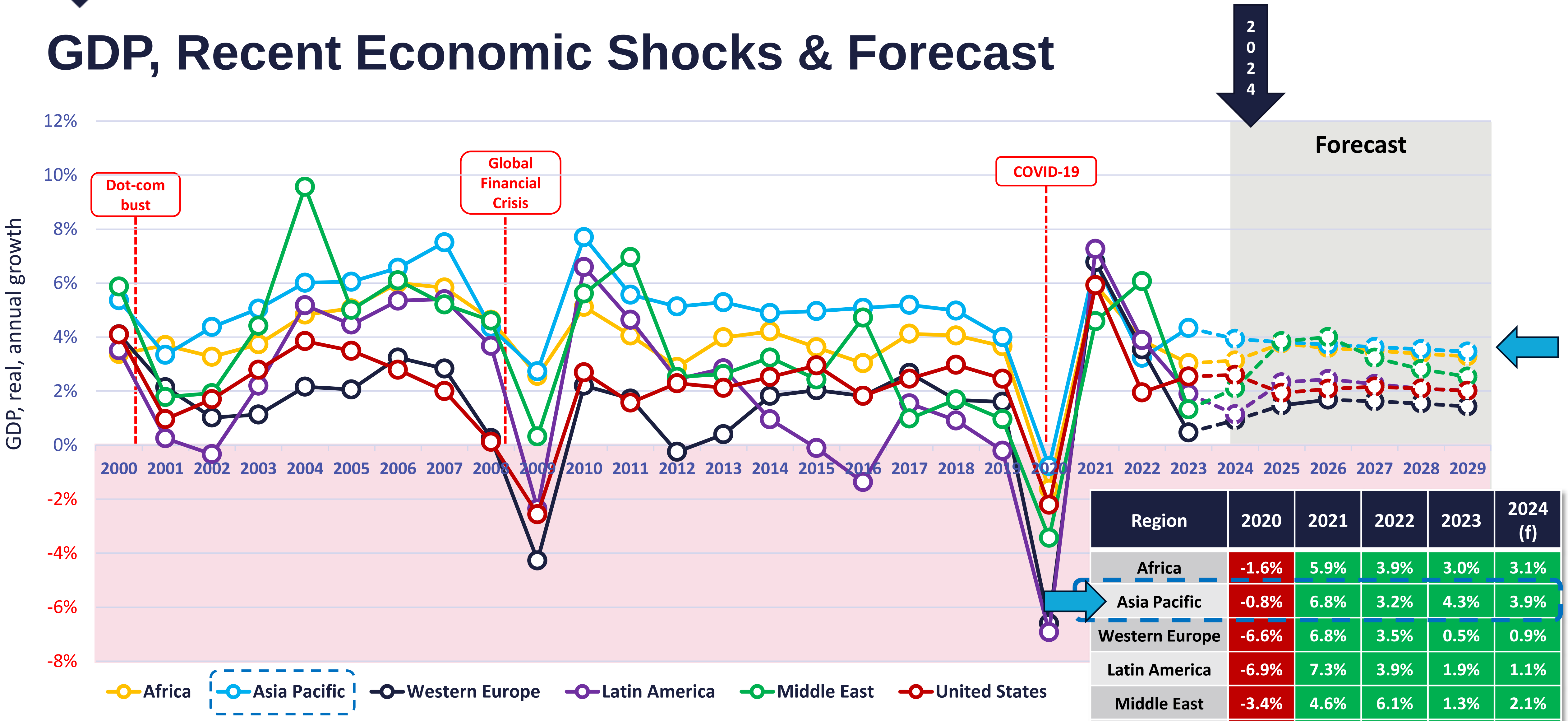
Aviation Week Intelligence Network

September 2024

COMMERCIAL
2025
FORECAST
OUTLOOK

Commercial Market Trends, Drivers & KPI

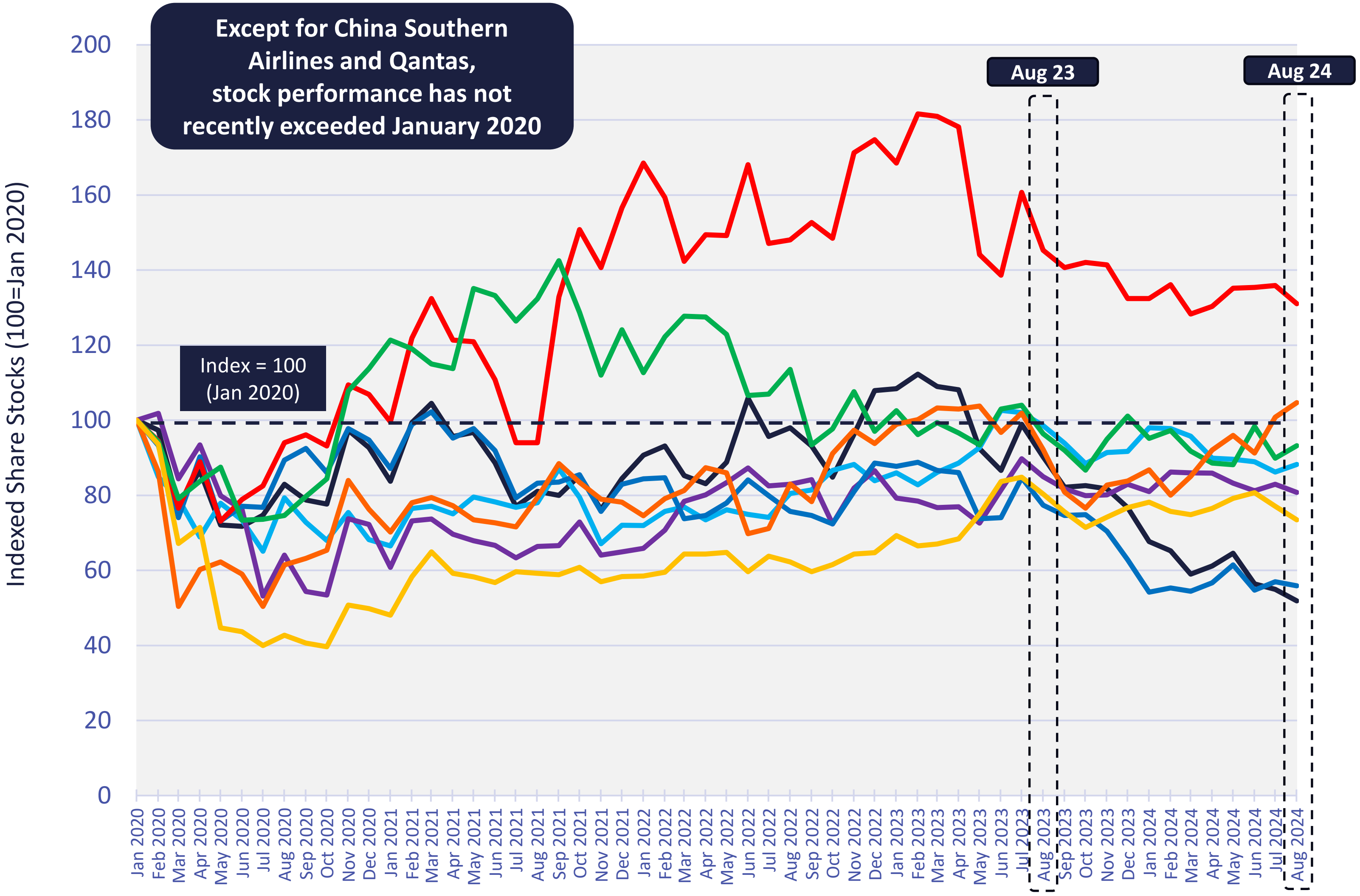
GDP, Recent Economic Shocks & Forecast



Region	2020	2021	2022	2023	2024 (f)
Africa	-1.6%	5.9%	3.9%	3.0%	3.1%
Asia Pacific	-0.8%	6.8%	3.2%	4.3%	3.9%
Western Europe	-6.6%	6.8%	3.5%	0.5%	0.9%
Latin America	-6.9%	7.3%	3.9%	1.9%	1.1%
Middle East	-3.4%	4.6%	6.1%	1.3%	2.1%
United States	-2.2%	5.9%	2.0%	2.5%	2.6%
World	-3.1%	6.5%	3.1%	2.7%	2.7%

Source: Oxford Economics Ltd (20 August 2024 update)

Leading Asian Airlines - Stock Prices



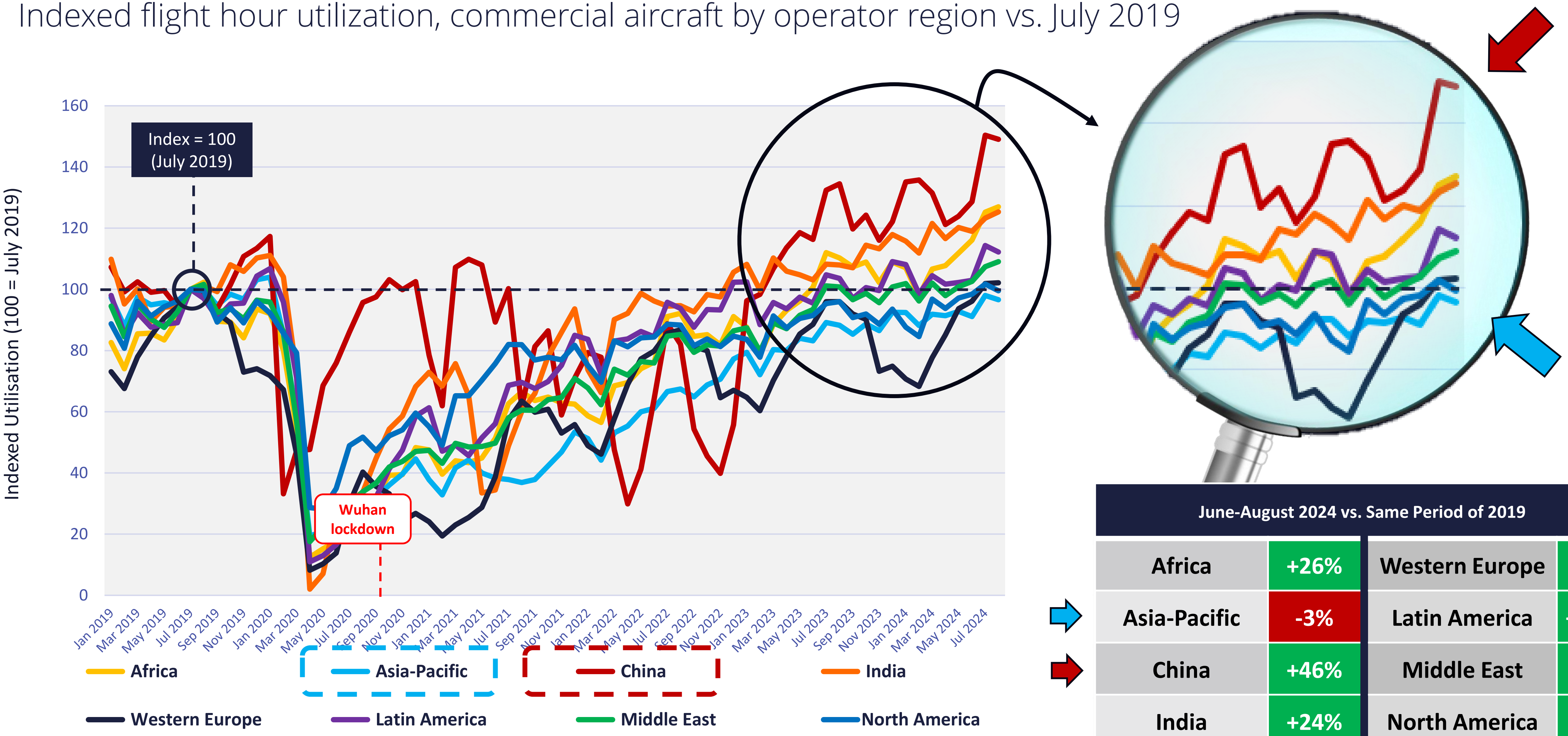
	Year-on-Year Change			
		30-Aug-24	31-Aug-23	Change
	AIR CHINA	3.34	5.81	-42.5%
	ANA	2,945.50	3,290.00	-10.5%
	CATHAY	7.95	8.36	-4.9%
	中國東方航空 CHINA EASTERN	2.00	2.77	-27.8%
	中国南方航空 CHINA SOUTHERN	5.70	6.32	-9.8%
	KOREAN AIR	22,050.00	22,800.00	-3.3%
	QANTAS	6.71	5.91	+13.5%
	SINGAPORE AIRLINES	6.28	6.87	-8.6%

Note: Figures in local currency.

Source: Yahoo! Finance

Utilization Change – Region

Indexed flight hour utilization, commercial aircraft by operator region vs. July 2019



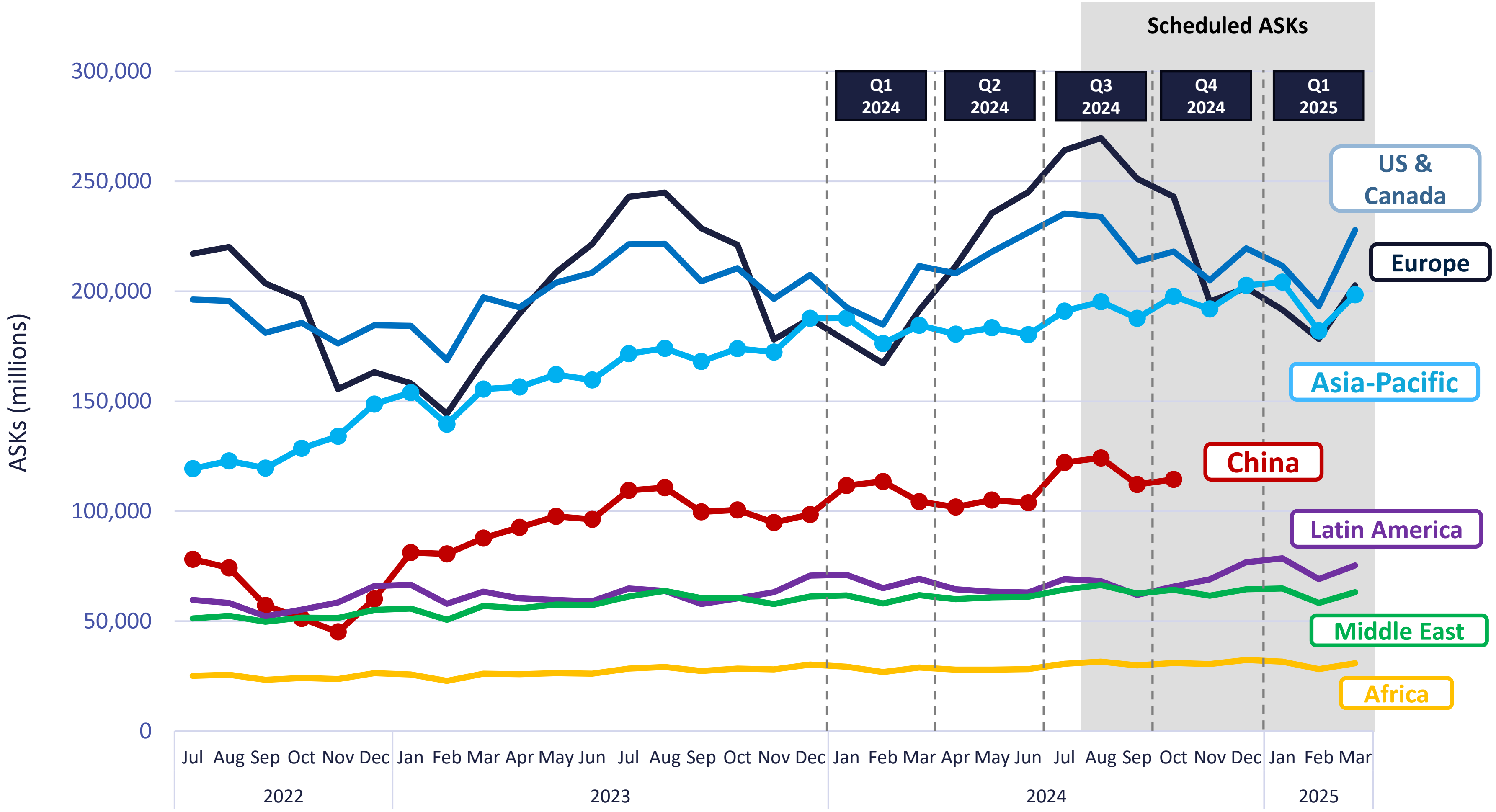
June-August 2024 vs. Same Period of 2019			
Africa	+26%	Western Europe	+2%
Asia-Pacific	-3%	Latin America	+15%
China	+46%	Middle East	+8%
India	+24%	North America	+1%

Source: Tracked Aircraft Utilization (TAU), Aviation Week Intelligence Network, Copyright 2024.

Scheduled & Historic Available Seat Kilometers (ASKs)

Scheduled airline capacity by region (as of 5 Sept 24)

ASM ROUTE DEVELOPMENT CONSULTANTS



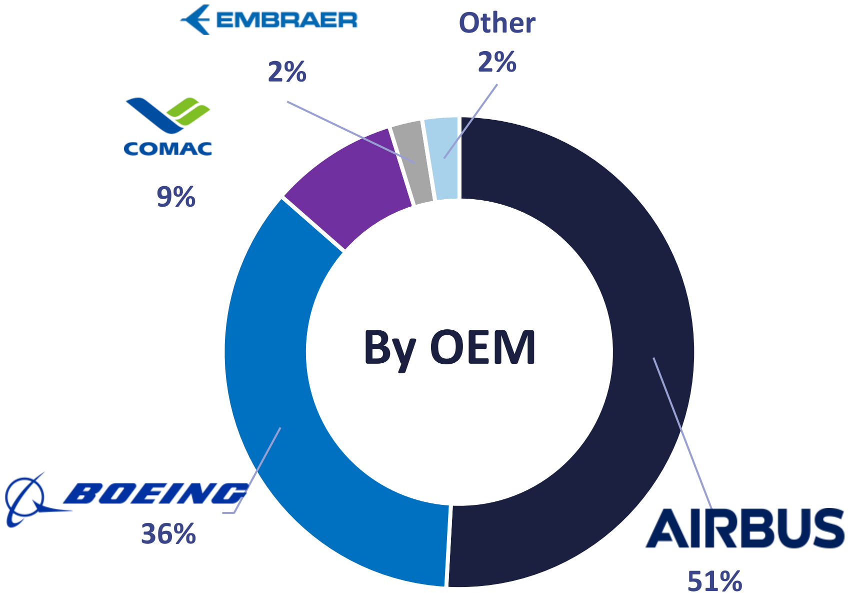
Region	Q4 24 vs. 23 % Change	Q1 25 vs. 24 % Change
Europe	+9%	+7%
U.S. & Canada	+5%	+7%
Asia-Pacific	+11%	+7%
China	*	*
Latin America	+9%	+9%
Middle East	+6%	+3%
Africa	+8%	+7%

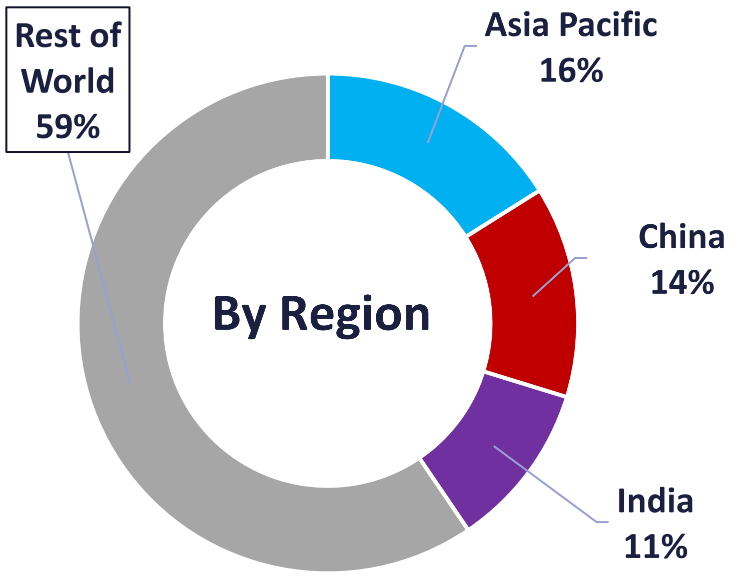
Note: "*" Data comparison unavailable.

Source: Airport Strategy & Marketing (ASM) Consulting, Aviation Week Network

Order Backlog

Market shares for commercial firm orders August 2024
Total: 16,889 aircraft, 79% Narrowbodies





Asia Pacific & China Backlog

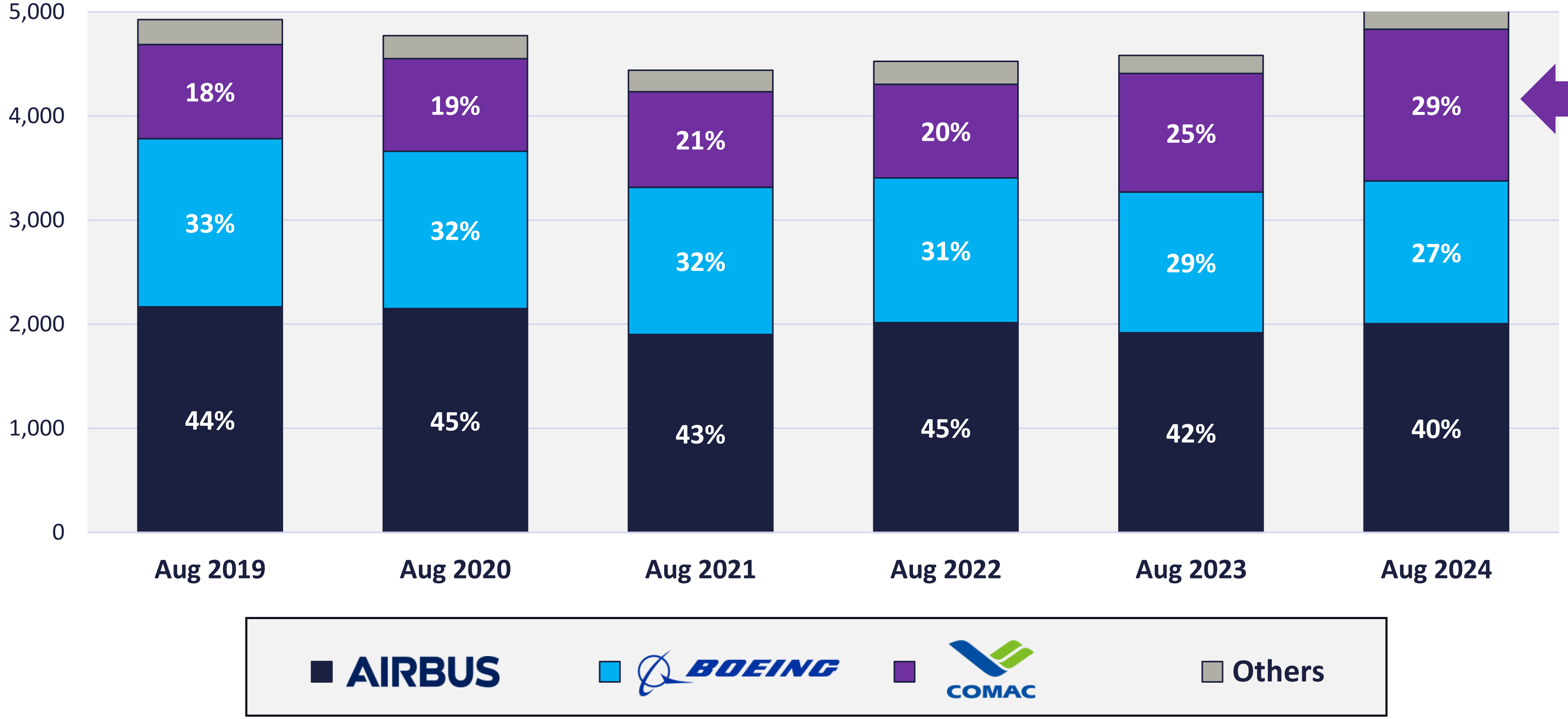
Aircraft Family	On Order
A320	1,681
B737	1,026
C919	1,004

Operator/Lessor	Aircraft	On Order
AIRASIA	A321-200N	358
LION AIR [INDONESIA]	737 Max 8	179
	A320-200N	120
VIETJET AIR	A321-200N	107
CHINA SOUTHERN AIRLINES	C919	104
AIR CHINA	C919	99
AVIC LEASING	ARJ21	99
CHINA EASTERN AIRLINES	C919	98
VIETJET AIR	737 Max 8200	76
	737 Max 8	75

Order Backlog – China and Asia Pacific

Market shares for commercial firm orders for August 2019 to 2024

Just over 5,000 aircraft on order from airlines and lessors at the end of August 204



In 2024, COMAC overtook Boeing with the second most firm order aircraft

Source: Fleet Discovery, Aviation Week Intelligence Network, Copyright 2024.
https://aviationweek.com/awin/data-tools

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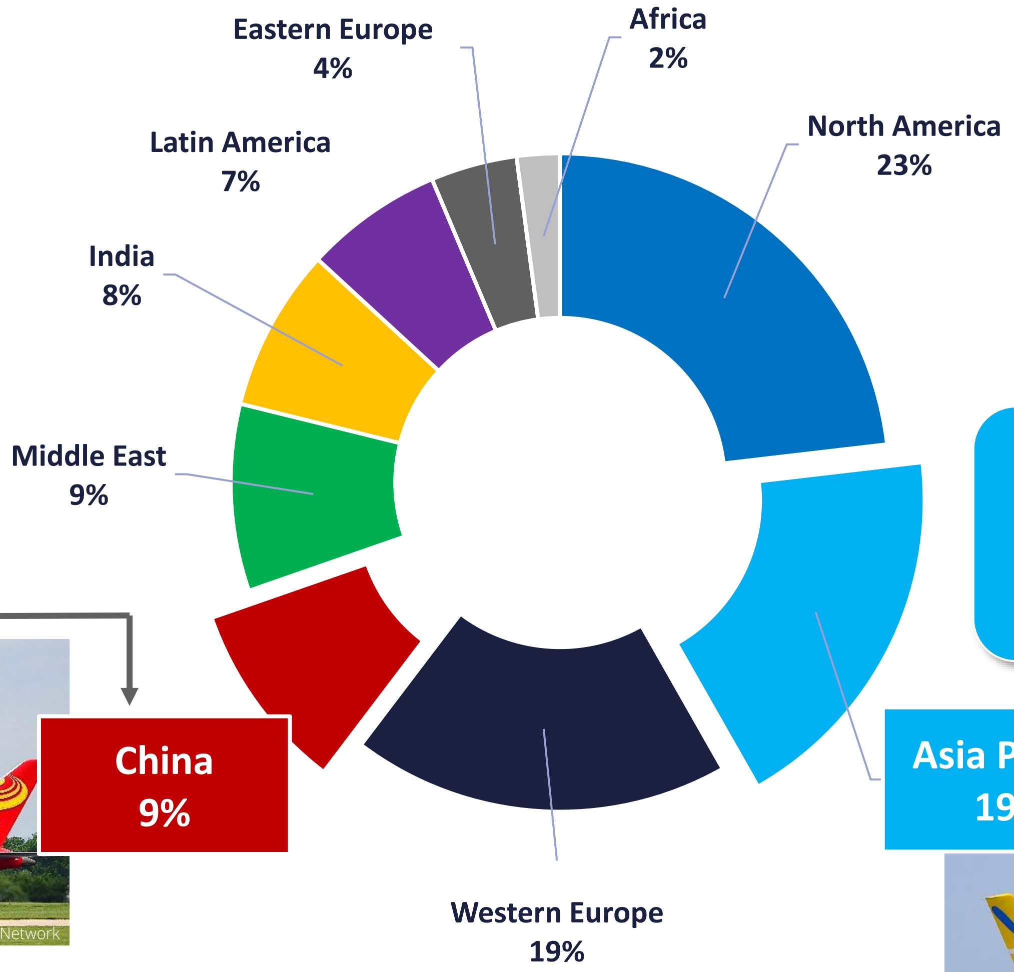
Fleet Forecast 2025-2034

Preliminary

Forecast: New Aircraft Deliveries by Region (2025-34)

Preliminary forecasted annual new build deliveries, no PTFs or return from storage



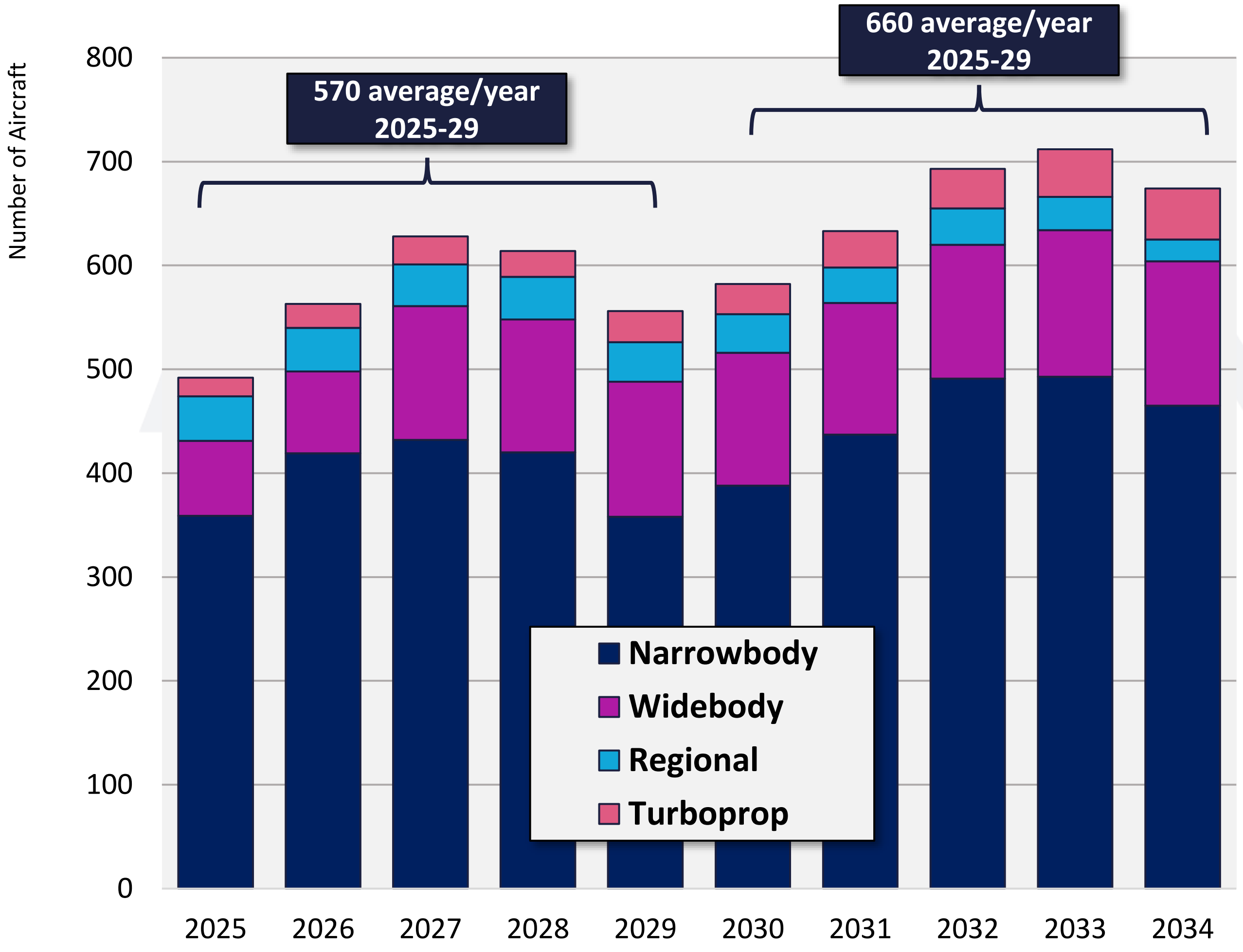
2,053
aircraft deliveries to Chinese operators

4,094
aircraft deliveries to Asia Pacific operators

Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.

Forecast: Trends in Commercial Deliveries (APac + China)

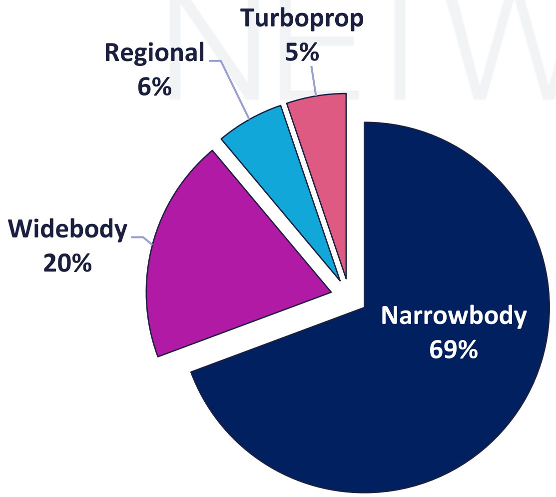
Preliminary forecasted annual new build deliveries



Highlights

- 6,100+ new deliveries, Asia Pacific & China
- 69% NB; 48% Airbus, 37% Boeing, 10% COMAC
- 12,200+ new engine deliveries
- Headwinds: supply chain, labor, production capacity…

2025-34 Share of Deliveries
APAC & China

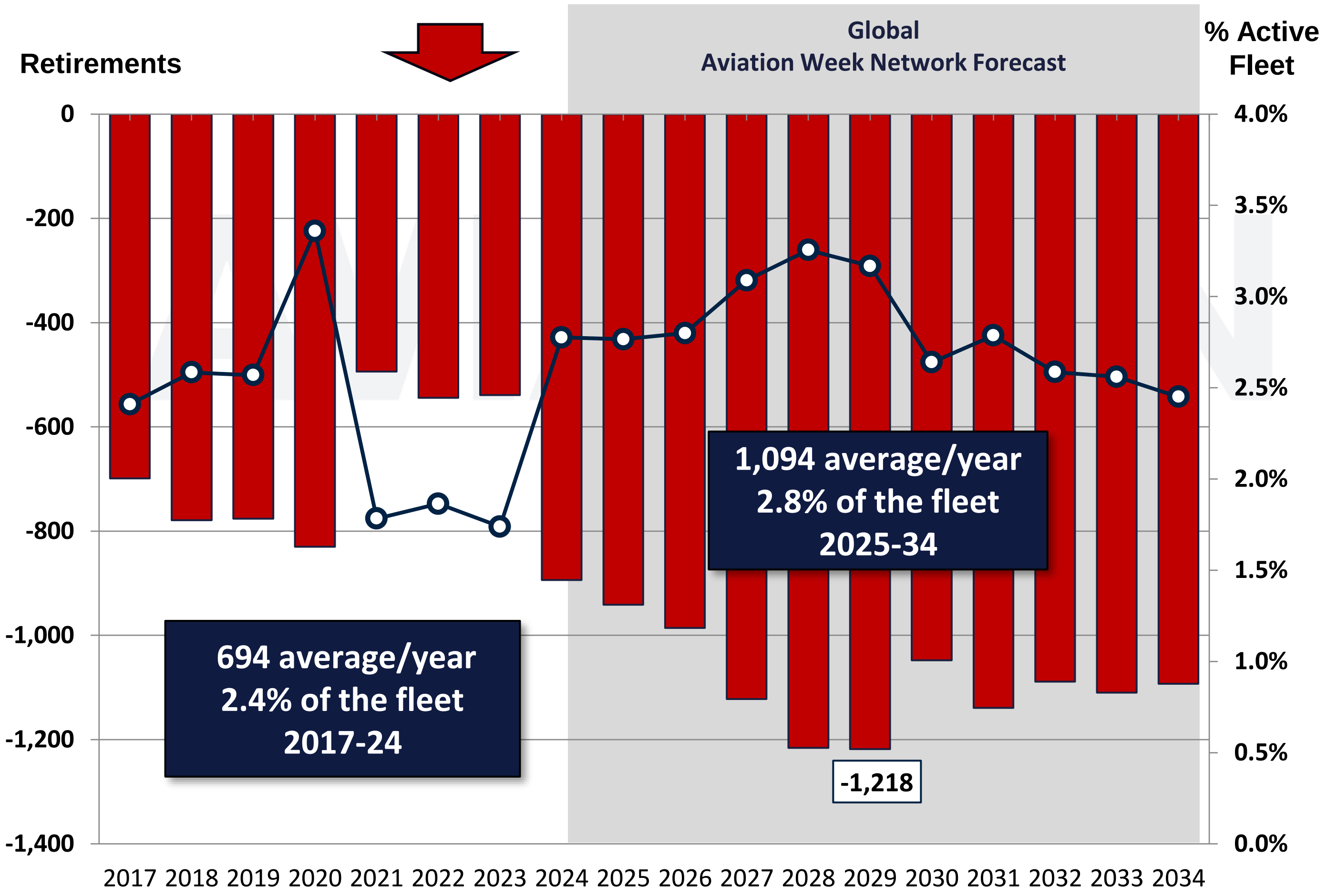


Narrowbodies

Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.

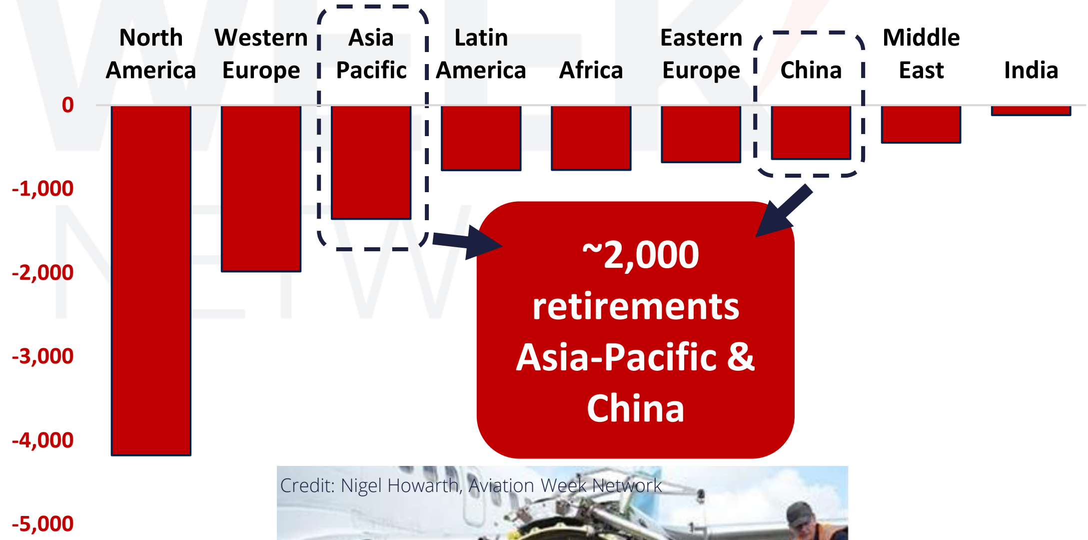
Forecast: Global Retirement Trends

Annual retirements historical & forecasted, % of in-service fleet



~10,900 Retirements 2025-34

Recycled Parts Impact on USM Market?

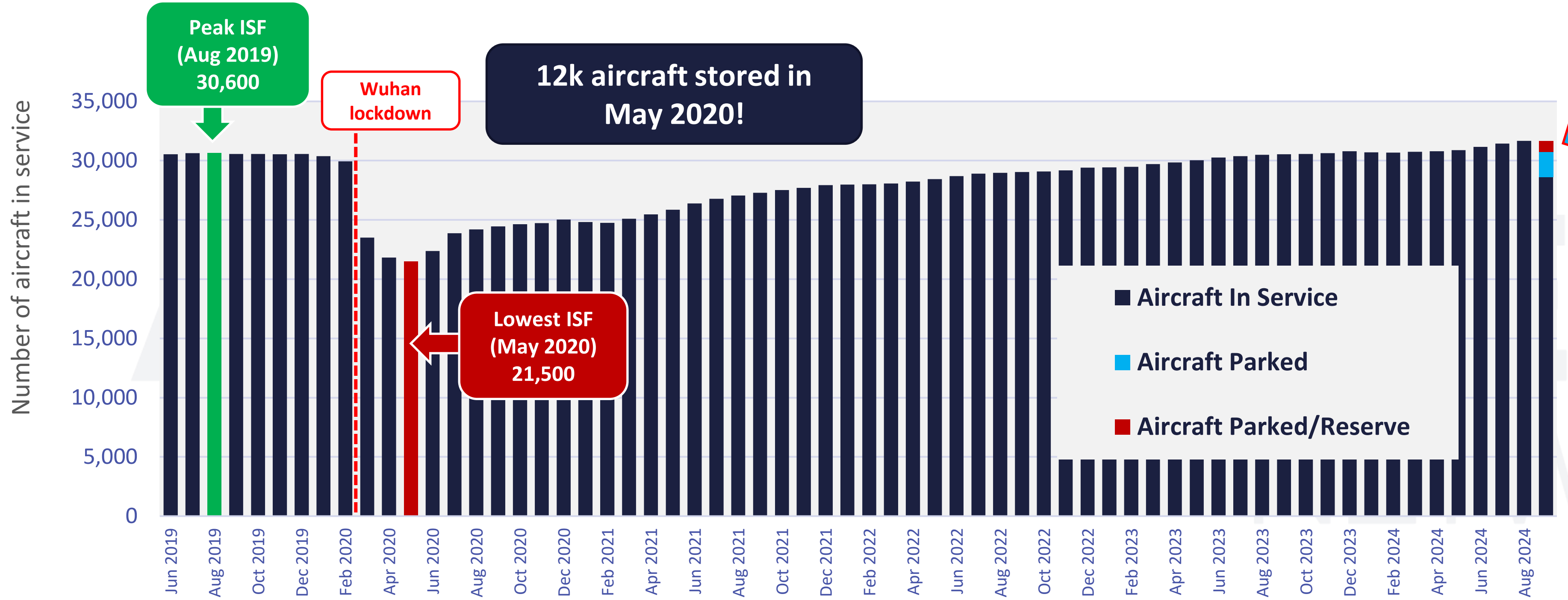


CFM56 being removed from 737-700

Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.

Global Historic Trends: Storage & In-Service Fleet

Long-term storage post-pandemic, active fleet, and under-utilized



10% of the global fleet temporarily parked or under-utilized, Sep 2024

Parked Aircraft During Pandemic

~31,670 In-Service September 2024; Now above 2019 peak fleet

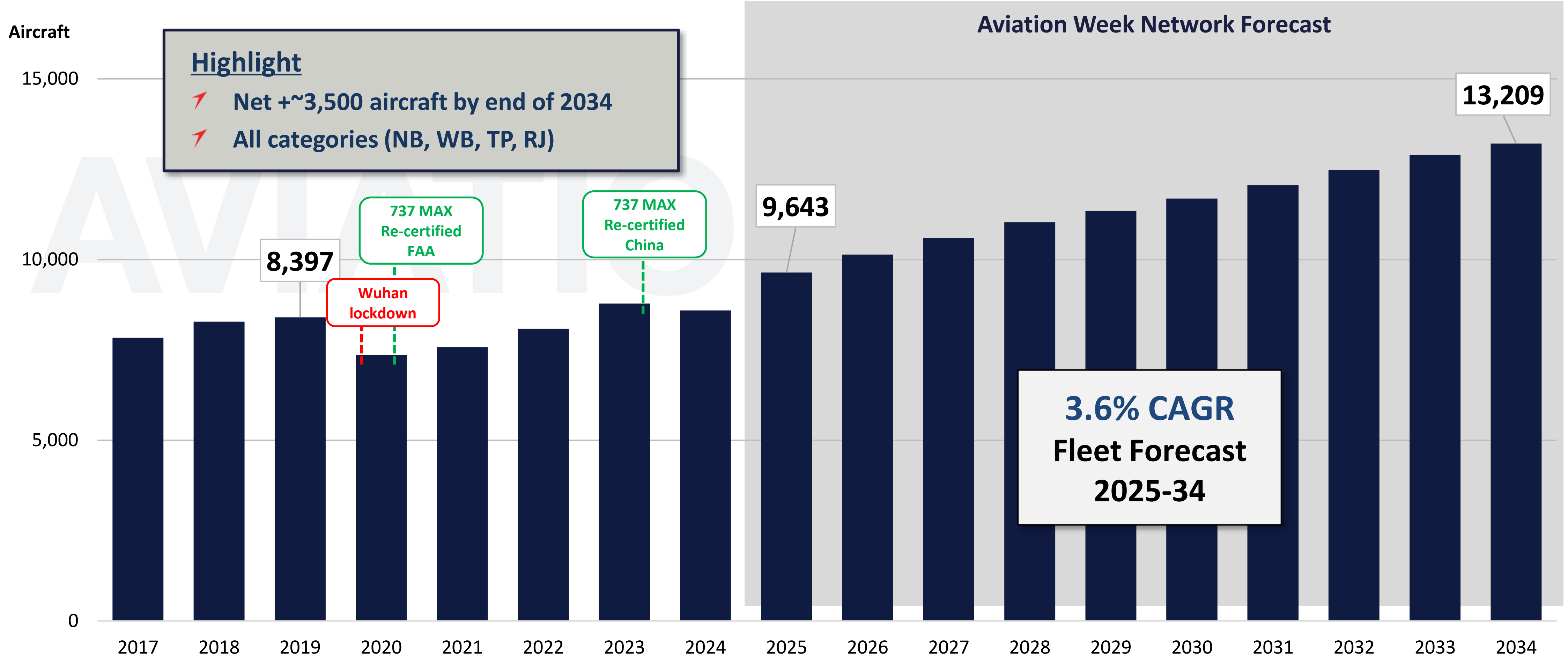
Aircraft Stored in Kingman, Arizona, USA

3k aircraft stored September 2024

Source: Fleet Discovery, Aviation Week Intelligence Network, Copyright 2024.

Forecast: In-Service Commercial Fleet – APAC & China

Preliminary forecasted active commercial aircraft, historical & forecasted



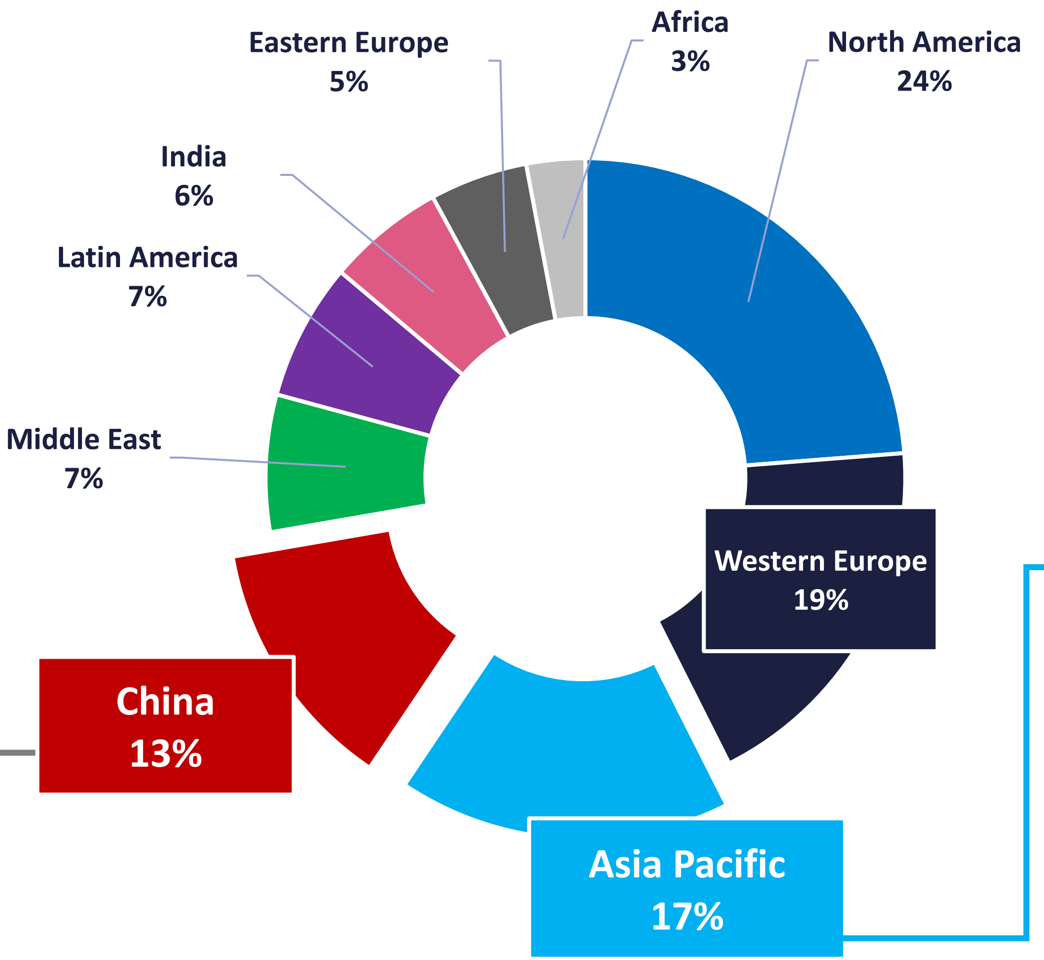
Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.

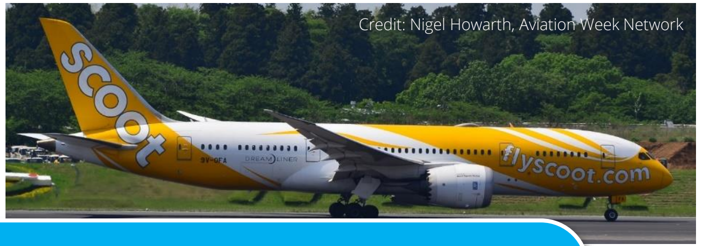
Forecast: Aircraft In-Service by Region (2034)

Asia OEM Share 2034

- 48% Airbus
- 38% Boeing
- 6% COMAC
- 4% ATR
- 1% Embraer
- 4% Others

~5,700
Aircraft in-service
end of 2033 after 2.3% CAGR
22% change over 10-years



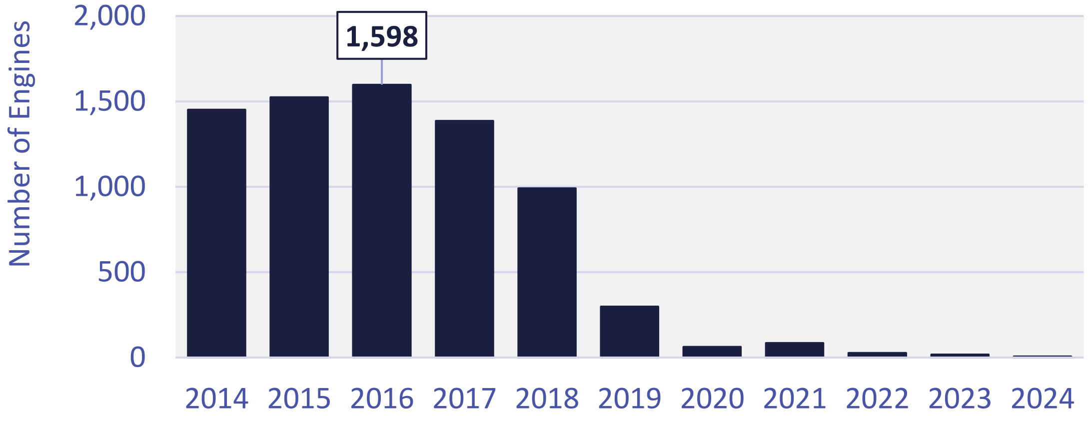


~7,400
Aircraft in-service
end of 2034 after 4.7% CAGR
51% change over 10-years

Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.

CFM Challenge: LEAP Delivery Production Needed

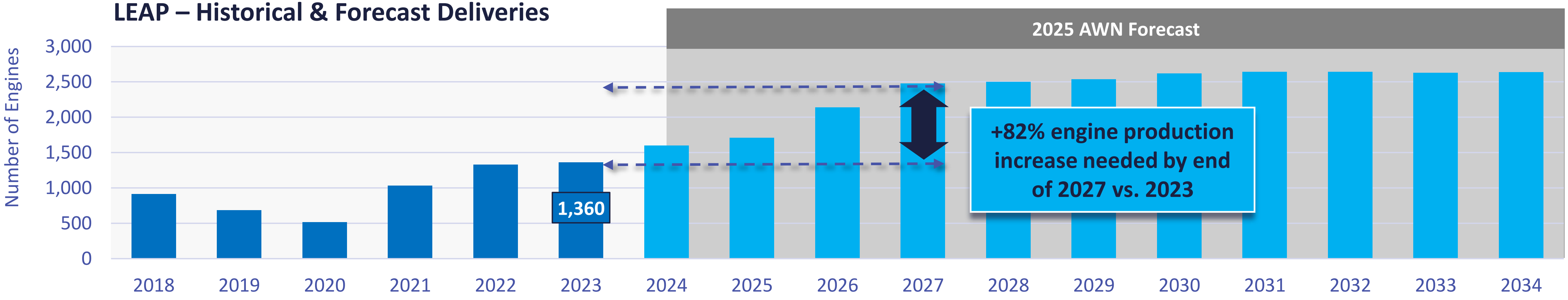
CFM56 – Historical Deliveries



Highlights

- 82% production increase needed by 2027 to meet projections.
- 2016 busiest year for CFM56 deliveries, ~1,600 units shipped.
- 2018 busiest year with combined CFM56 & LEAP engines, 1,904.
- 2023 +1,360 LEAP engines delivered, forecast to exceed 1,700 in 2025.
- More than +24,500 LEAP engines needed over 2025-34 period (w/o spares).
- Challenges: A320 orderbook, safety exemptions for -7 & -10 nacelle deicing withdrawn… COMAC orders growing…

LEAP – Historical & Forecast Deliveries



Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.

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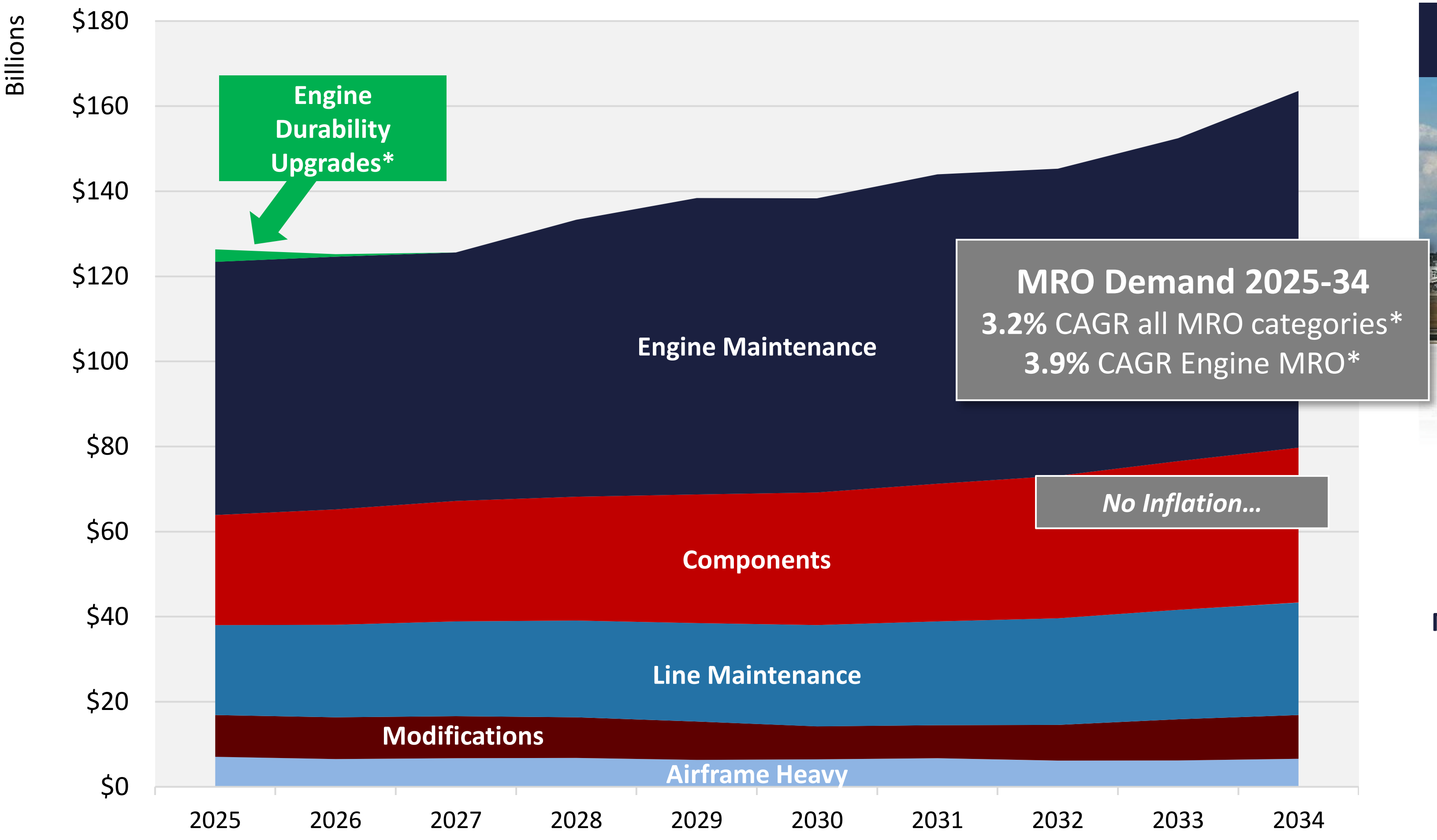
Commercial MRO Forecast 2024-2033

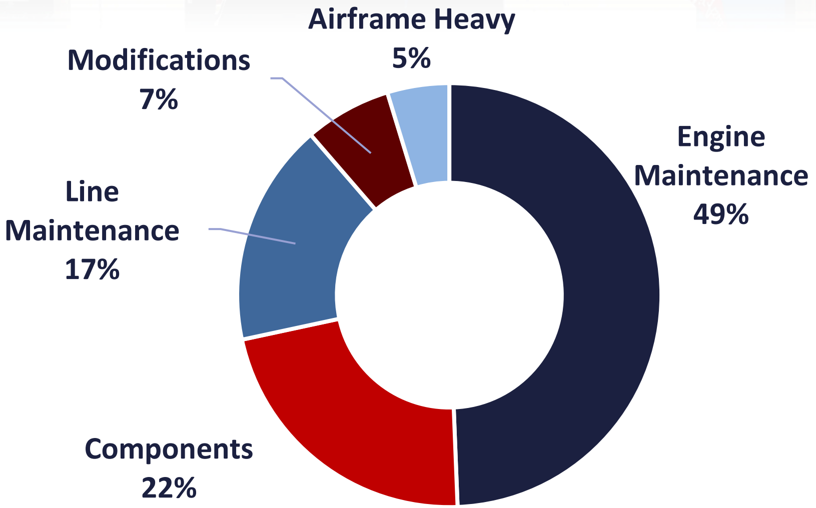
Preliminary

Forecast: MRO Demand Overview

Global MRO aftermarket by category, constant US dollars



$1.4T MRO Demand 2025-34



Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.
Note: *2025 and 2026 engine technical upgrade events not included in CAGR calculation.

NB Engine Durability Events - Preliminary

$3.5 billion MRO aftermarket impacts for Pratt & Whitney GTF & CFM LEAP

Narrowbody Engine Durability Issues

- **GTF - combustion/heat exchanger**
- **GTF - HPT #1 and #2, HPC (2015-21 year of manufacture)**
- **LEAP - fuel nozzles, R.B.S.**

In the News…

“Pratt & Whitney Hits GTF Inspection Targets, But Issues Linger…”

Source: Aviation Daily, Aviation Week Network (August 5, 2024)

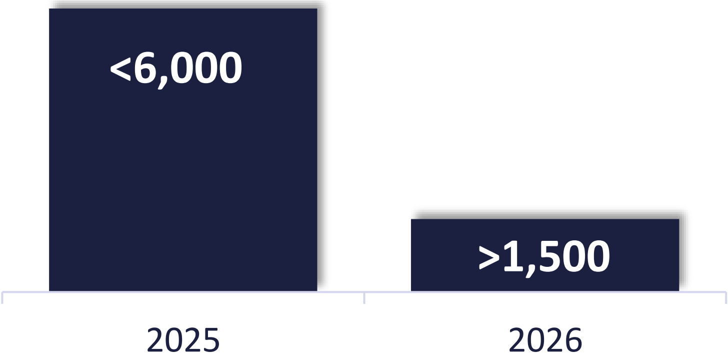
“Pratt & Whitney: GTF Inspection Plan Metrics Remain Steady…”

Source: Aviation Daily, Aviation Week Network (September 12, 2024)

Aircraft/engines needing fixes 2025-26

Aircraft	Engine Models
737 Max 8/9	LEAP-1B
A220-100/300	PW1500G
A319/320/321neo	LEAP-1A
A319/320/321neo	PW1100G-JM
C919	LEAP-1C
E190/195-E2	PW1900G

Potential Cumulative Engine Events



P&W PW1100G

Credit: Nigel Howarth, Aviation Week Network

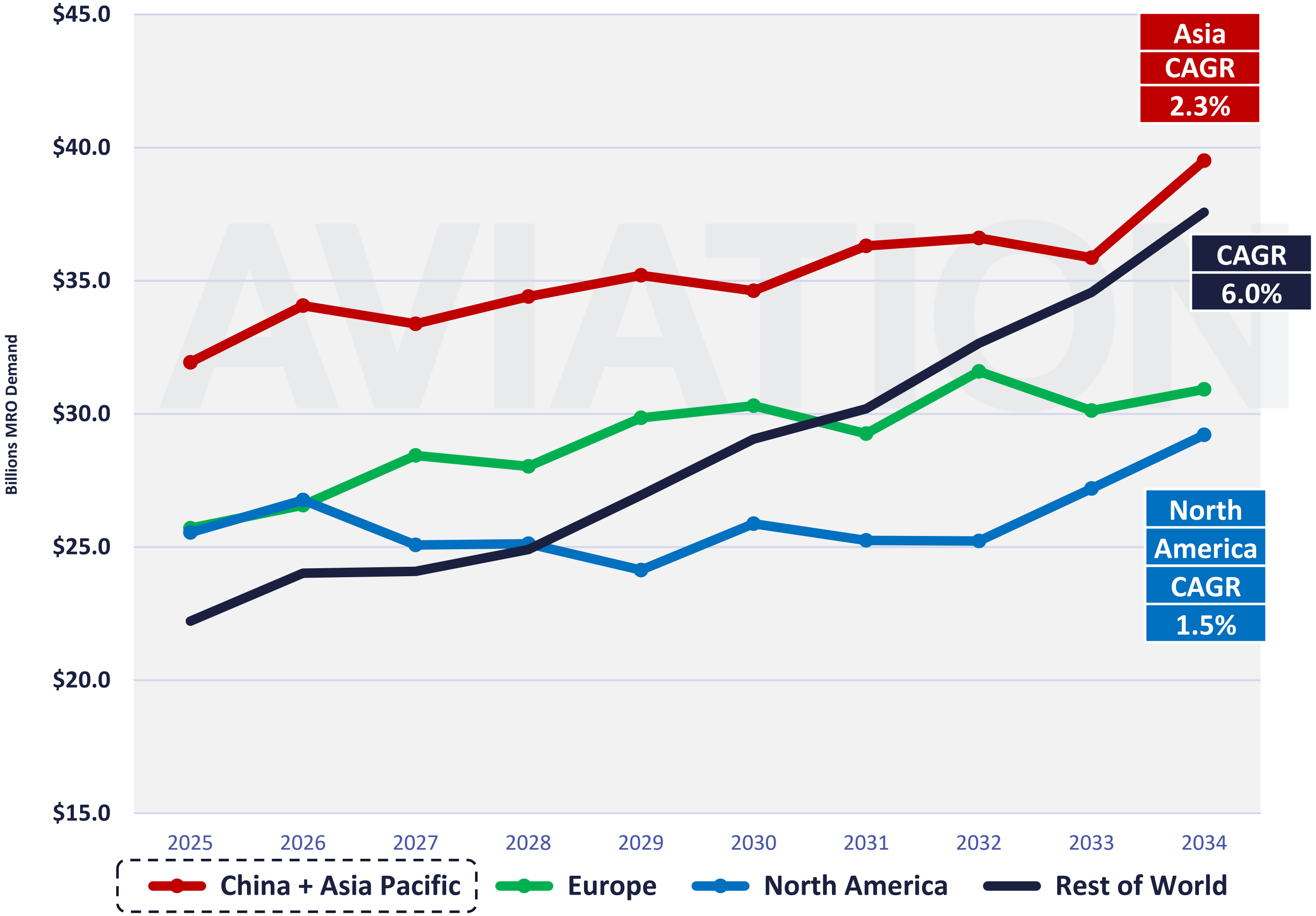
CFM LEAP

Credit: Antoine Fafard, Aviation Week Network

Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.

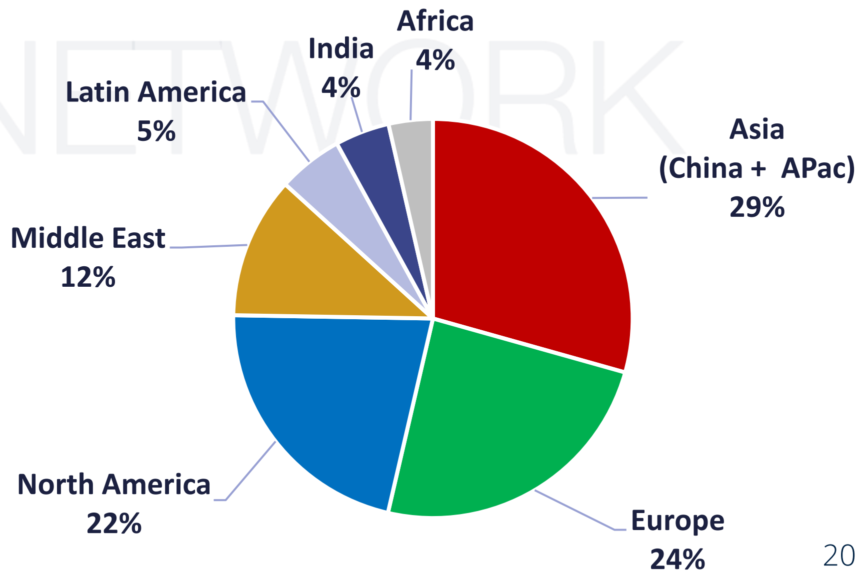
Forecast: MRO Demand by Major Region

Regional trends, constant US dollars



Highlights

- Asia at large generates $351.9 billion MRO demand.
  - $7.5 billion increase, 2034 vs. 2025.
- The fastest MRO demand growth is India at 10.8% CAGR
- Headwinds: supply chain, labor, MRO capacity…

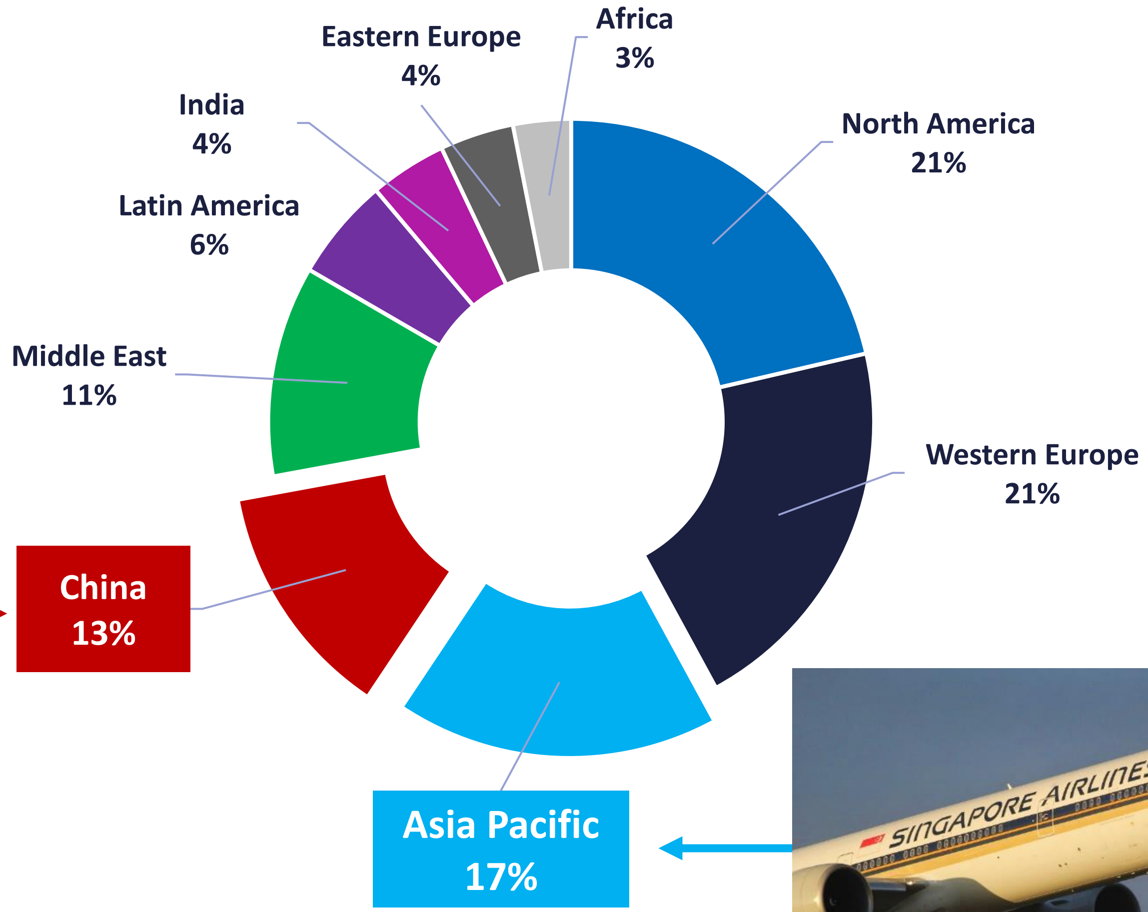


Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.
Note: *2025 and 2026 engine technical upgrade events not included.

Forecast: Regional MRO Demand, $1.4 Trillion (2025-34)

2.3% CAGR
MRO demand;
Over 37,000 events by the end of 2034

GAMECO
Ameco
MTU Maintenance



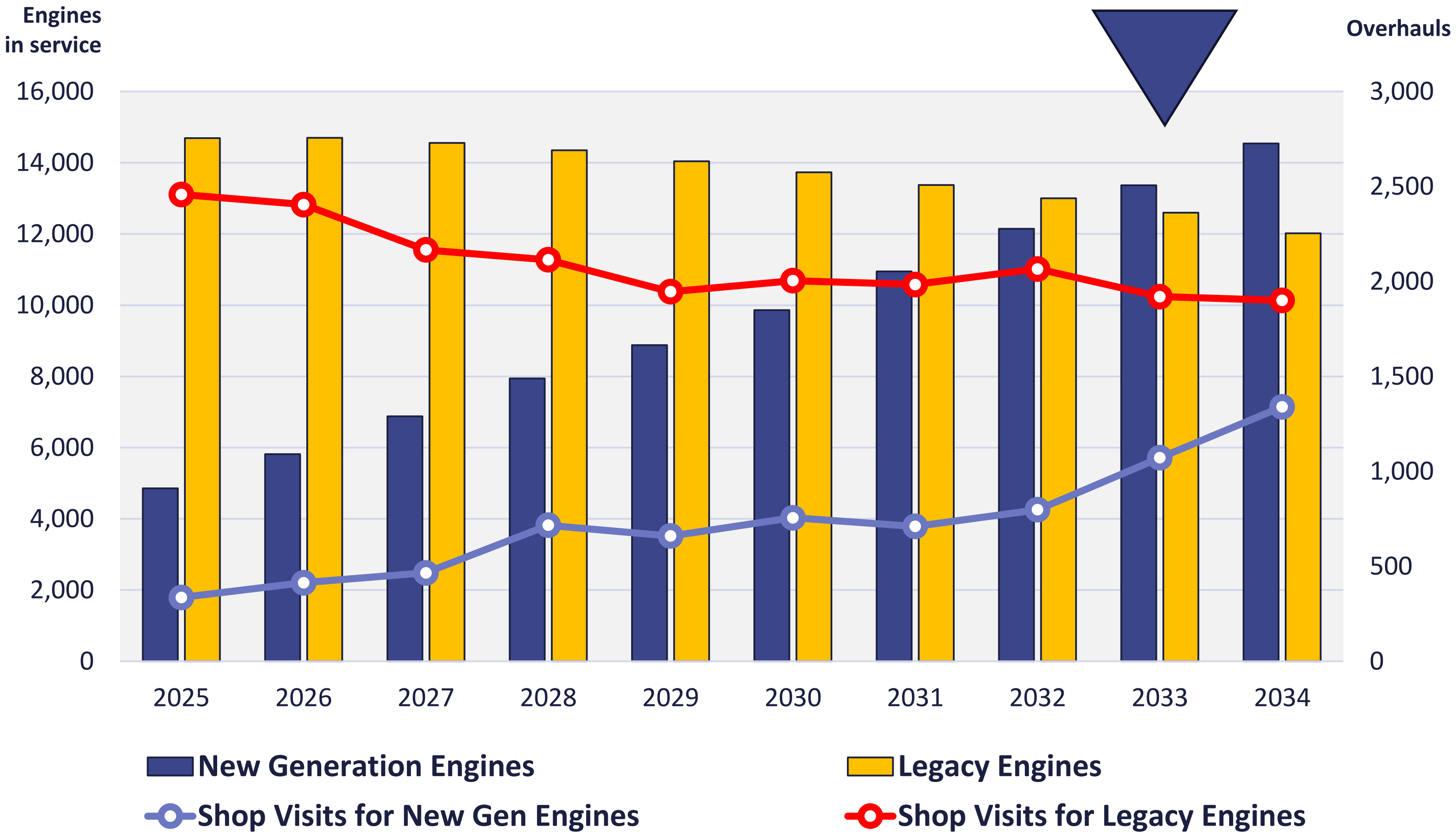
VAECO
ST Engineering
HAECO

2.4% CAGR
MRO demand;
Over 43,000 events by the end of 2034

Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.
Note: *2025 and 2026 engine technical upgrade events not included in CAGR calculation.

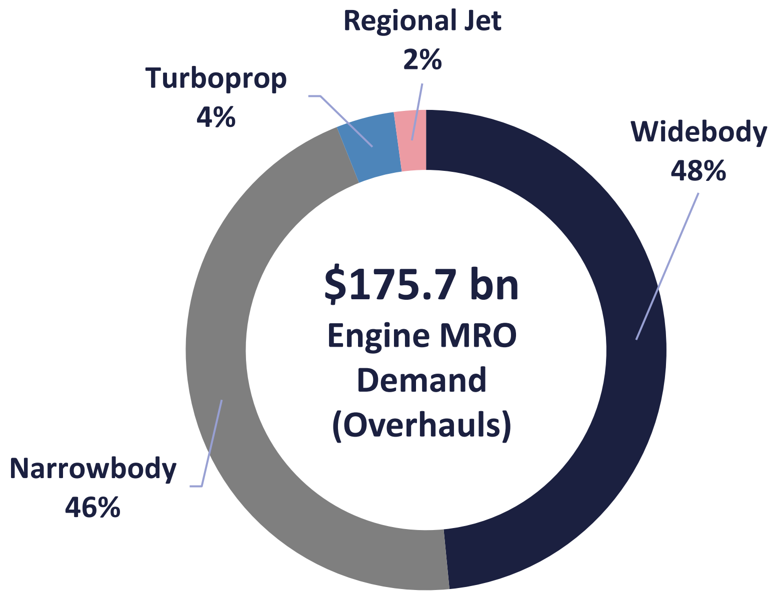
Forecast: Engine Fleet & Overhaul Events – Asia

New generation vs. legacy fleet share & SV event forecast



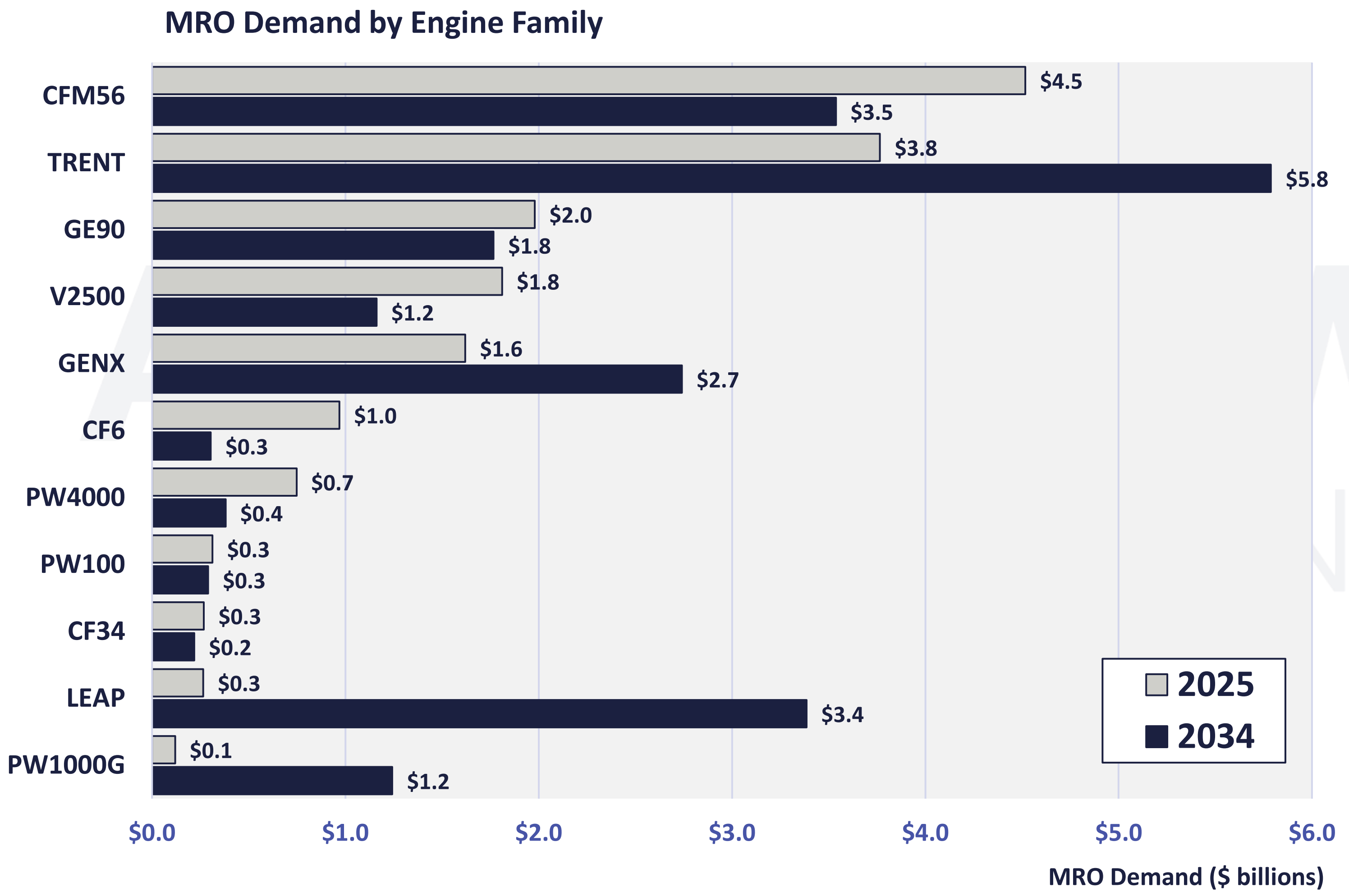
2033
Inflection Year
New Generation Engine Fleet

28,200+
Overhaul Events
Inflection beyond 2034



Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.
Note: LLPs and 2025 and 2026 engine technical upgrade events not included in CAGR calculation. New generation engines include Leap, PW1000G, GENX, GE9X and Trent 1000/7000/XWB.

Forecast: Engine MRO Demand – Asia Pacific & China



Trent Family

$41.5B Demand 10-year

CFM56 Family

$38.1B Demand 10-year

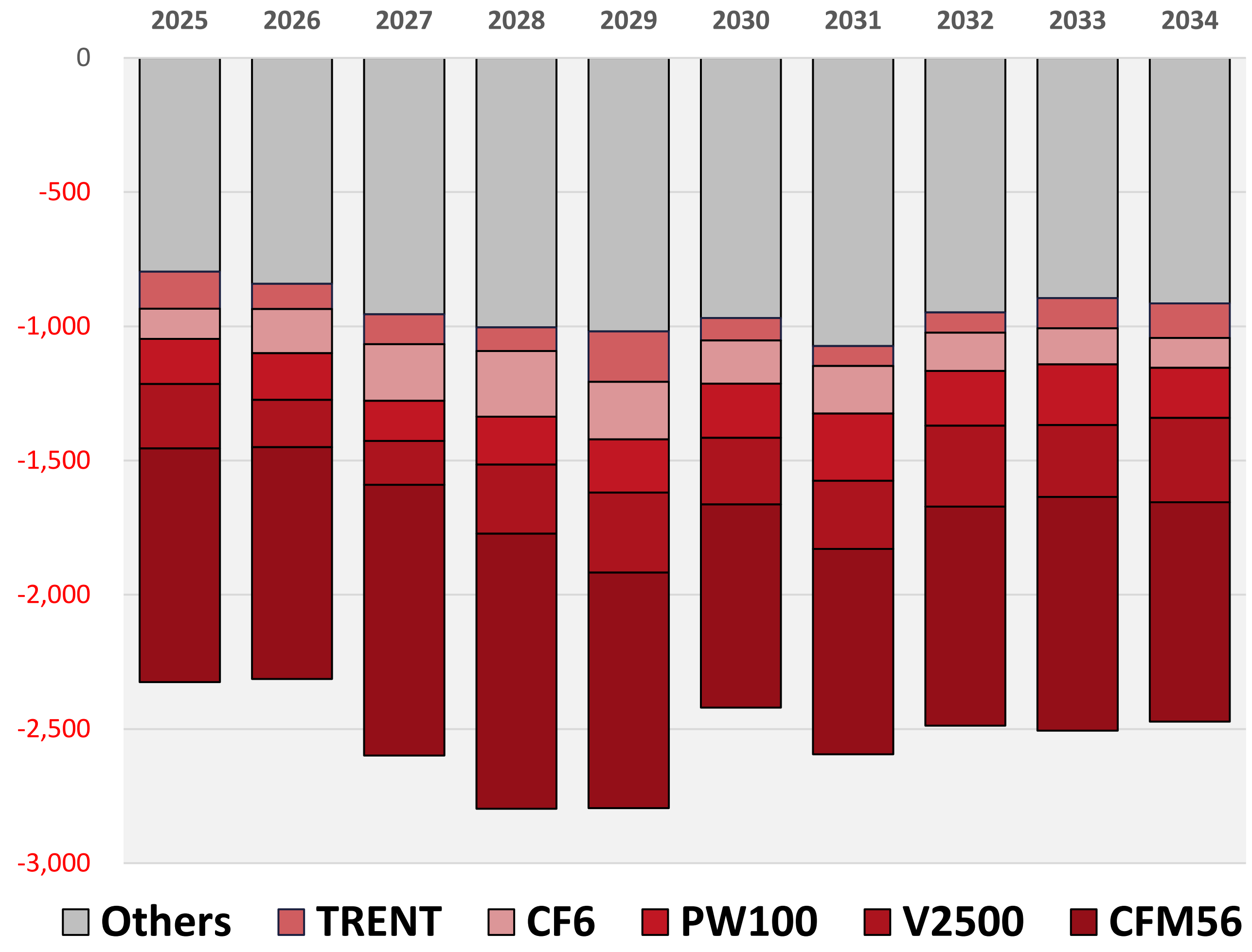
LEAP Family

$13.9B Demand 10-year

Source: 2025 Preliminary Commercial Aviation Fleet & MRO Forecast, Fleet Discovery, Aviation Week Network, Copyright 2024.
Note: LLPs and 2025 and 2026 engine technical upgrade events not included.

Forecast: Top Commercial Engines Coming to You Soon?

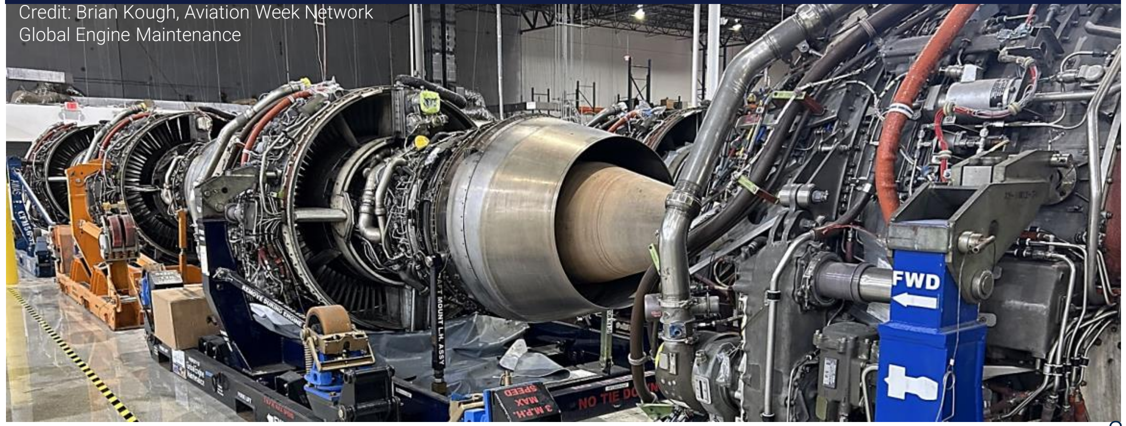
Engines worldwide associated with retiring aircraft: available as green time spares or USM?



Used spare parts/green time engines may depress pricing OEM/USM parts, and leases of popular legacy types.

- **Topping the list: 8,600 CFM56 and 2,500 V2500 powerplants.**
- **Deferred maintenance may delay or accelerate a/c retirements.**
- **Future: downward pressure on the price of legacy spares, leases, shop visits, & USM.**

CFM56



Credit: Brian Kough, Aviation Week Network Global Engine Maintenance

Source: Preliminary 2025 Commercial Aviation Fleet & MRO Forecast, Aviation Week Network, Copyright 2024.

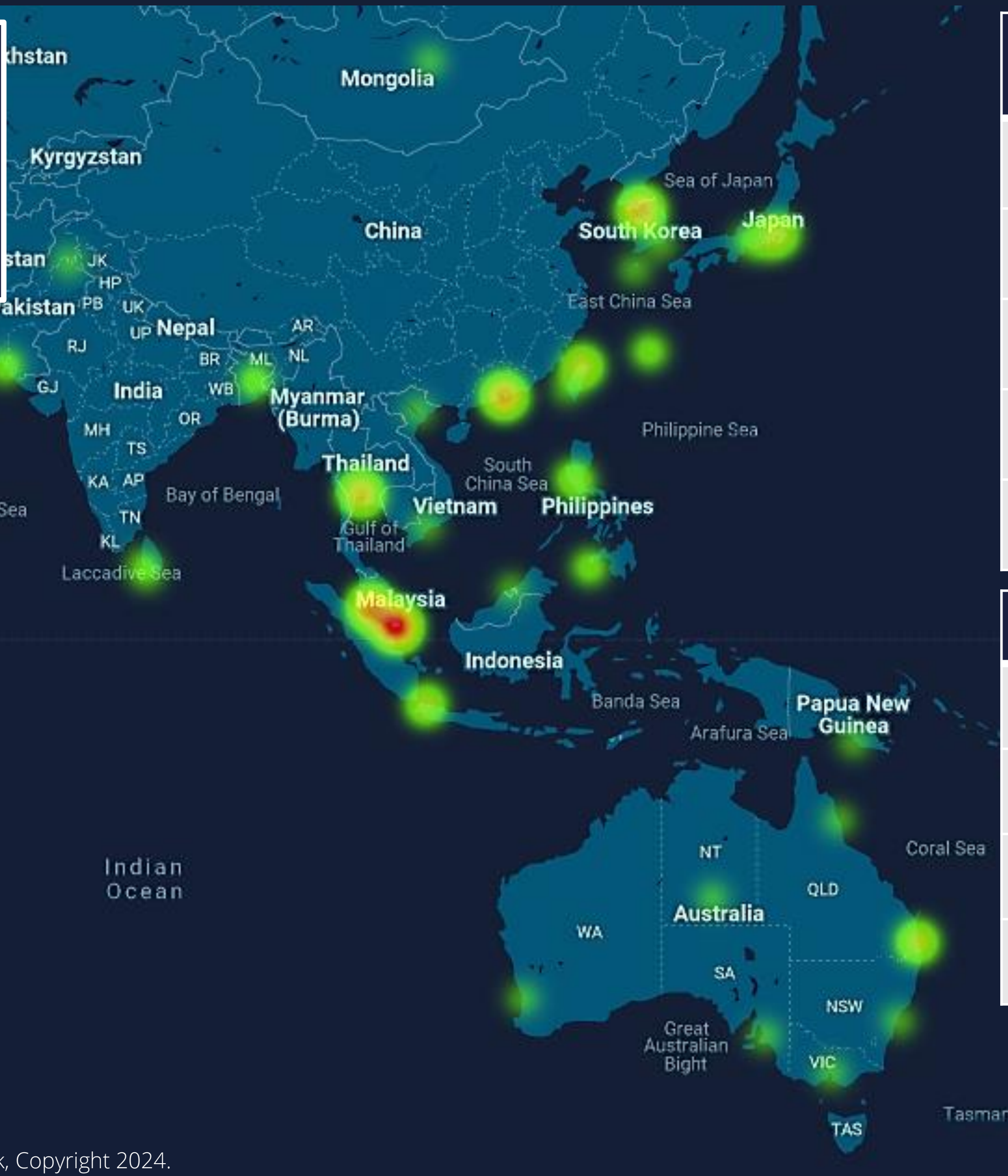
MROProspector

DISCOVER | ANALYZE | PLAN | FORECAST

Asia-Pacific MRO Provider Locations

Excludes ML China

All service types, density of providers not amount of customers



Top Foreign Region Operators Purchasing MRO

- United
- China Southern
- 中國東方航空 China Eastern
- IndiGo
- American Airlines
- FedEx
- Delta
- Air India
- Qatar Airways القطرية
- Emirates

Largest Asia-Pacific Operators

By Aircraft Count

ANA	Qantas
Cathay Pacific	Air New Zealand
Korean Air	Virgin Australia
Japan Airlines	Lion Air
Singapore Airlines	AirAsia aviation group

Contracts Outside of Asia-Pacific (224)

cfm	Pratt & Whitney An RTX Business
GA Telesis	Rolls-Royce
GE Aerospace	SR Technics
MTU Aero Engines	

Source: MRO Prospector, Aviation Week Network, Copyright 2024.

Asia-Pacific MRO Contract Flows Outsourced / Insourced

2024 heavy airframe & engine overhaul (AP excludes ML China)

Europe
29%

China
9%

North America
15%

Top Out-sourcers 55% of Contracts - $4.8 billion
CFM International
GA Telesis Engine Services
GE Aerospace
MTU Maintenance Zhuhai
Pratt & Whitney
Rolls-Royce
SR Technics Switzerland
ST Aerospace Guangzhou
Taikoo (Xiamen) (TAECO)

-$3.2 billion

Regional Net Loss

Due to Contract Patterns

Top In-sourcers 4% of Global Contracts + $1.5 billion
HAECO
EGAT
GE Evergreen Engine Services
GMF Aero Asia
Lufthansa Technik Philippines
SIA EC
Singapore Aero Engine Services
SriLankan Engineering
ST Engineering

Source: MRO Prospector, Aviation Week Network, Copyright 2024.

AVIATION WEEK Fleet&MRO FORECASTS

Thank You

Brian Kough, Senior Director,
Forecasts & Aerospace Insights,
Aviation Week Intelligence Network

September 2024 - Preliminary Forecast Results

Intelligence & Data Services |
Aviation Week Intelligence Network
Washington, D.C.