

Economic Outlook, Engine Values & Trends

Narrowbody Engine Focus



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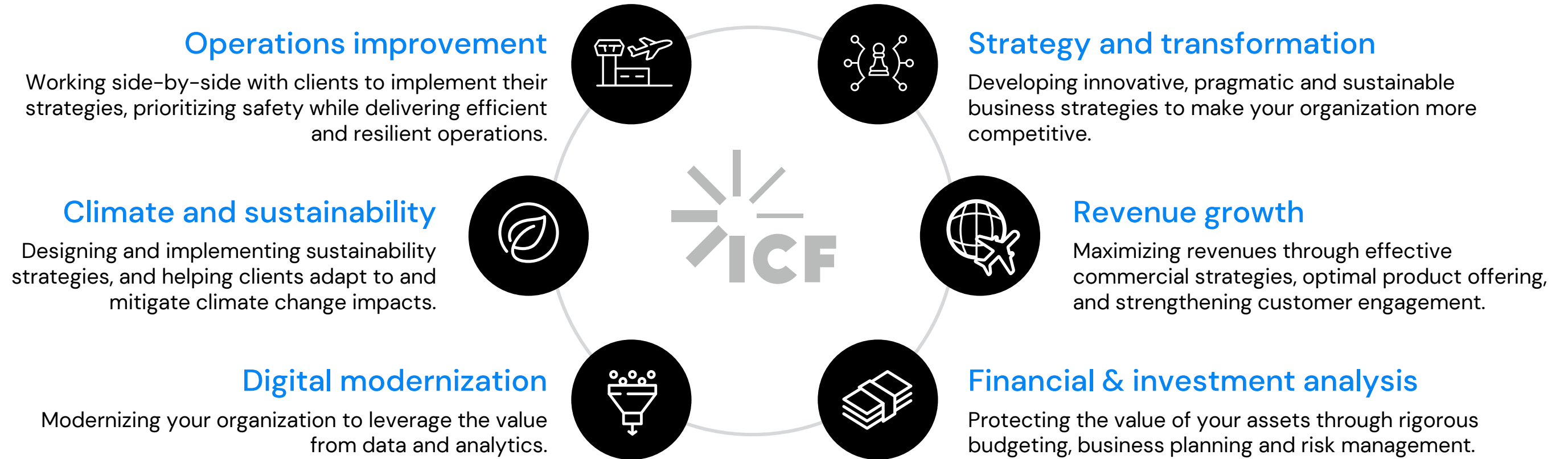
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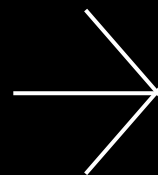
Today's agenda

- GDP Growth Rates
- Russia / Ukraine War
- Traffic Forecast
- Aircraft Supply
- Fleet Forecast & Retirements
- Factors Driving Engine Demand
- Engine Values and Lease Rates
- Key Takeaways

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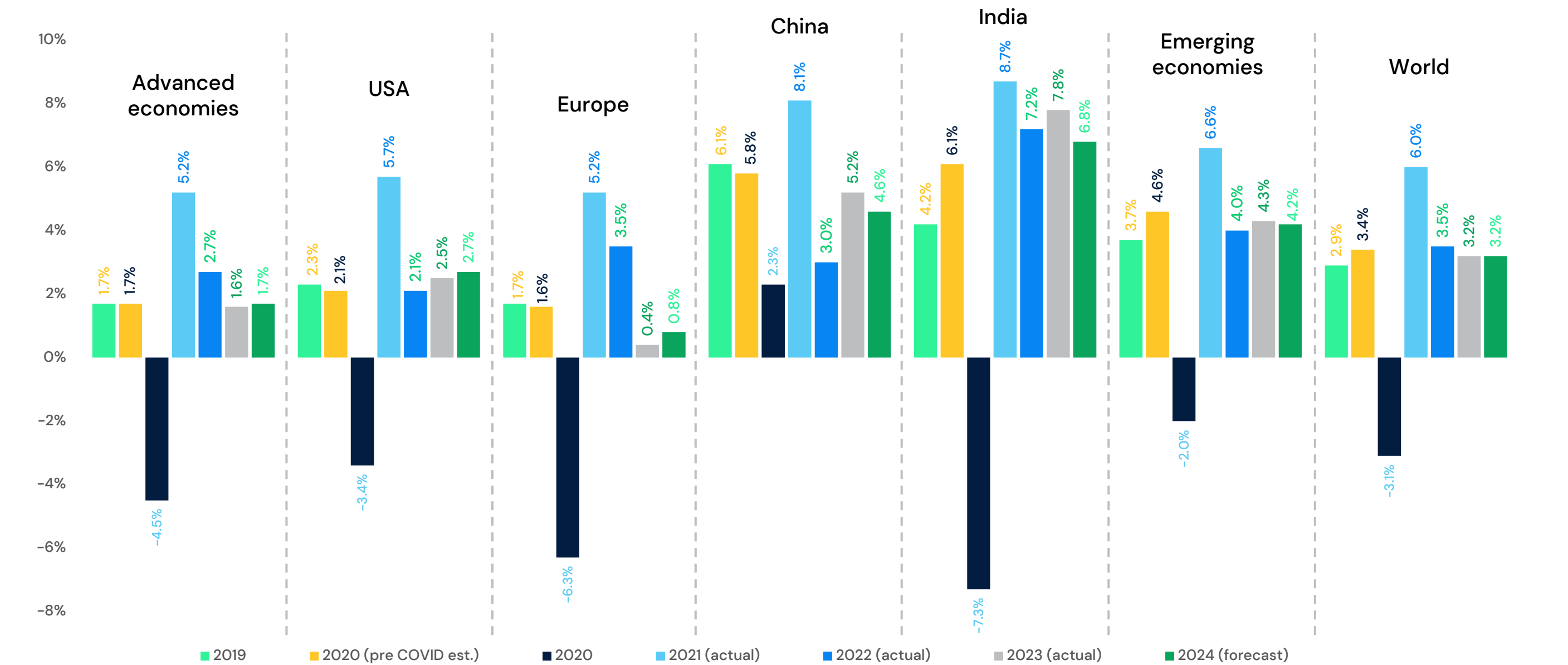
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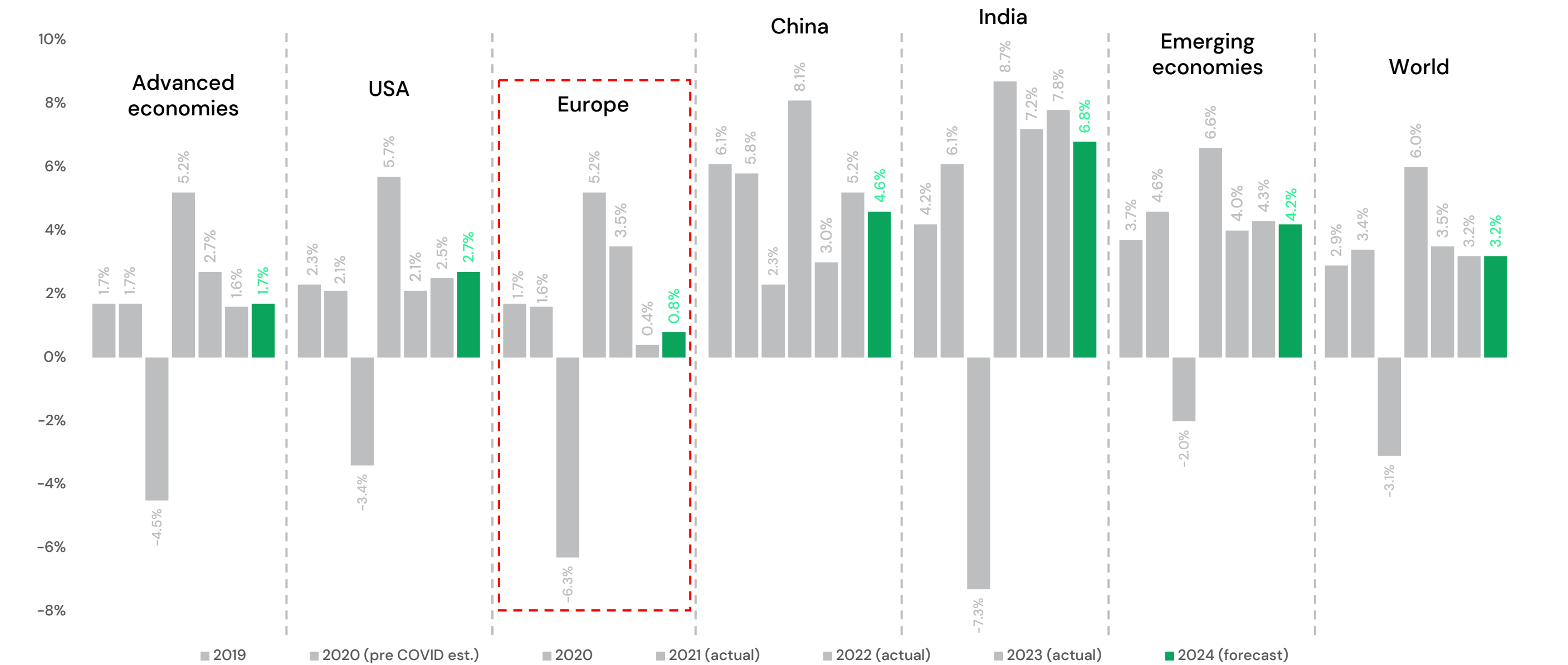
Post-COVID-19 pandemic has seen **high Y-O-Y growth rates** around the world with **India** experiencing the highest growth. **Conflict in Ukraine** and the **Middle East** has led to **reduced growth forecasts**, especially for **neighbouring regions**

GDP by world region 2019–2024 (% Y-o-y change)



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GDP by world region 2019–2024 (% Y-o-y change)



Russia's invasion of Ukraine resulted in market turmoil that has had more longer lasting effects on Europe than other regions

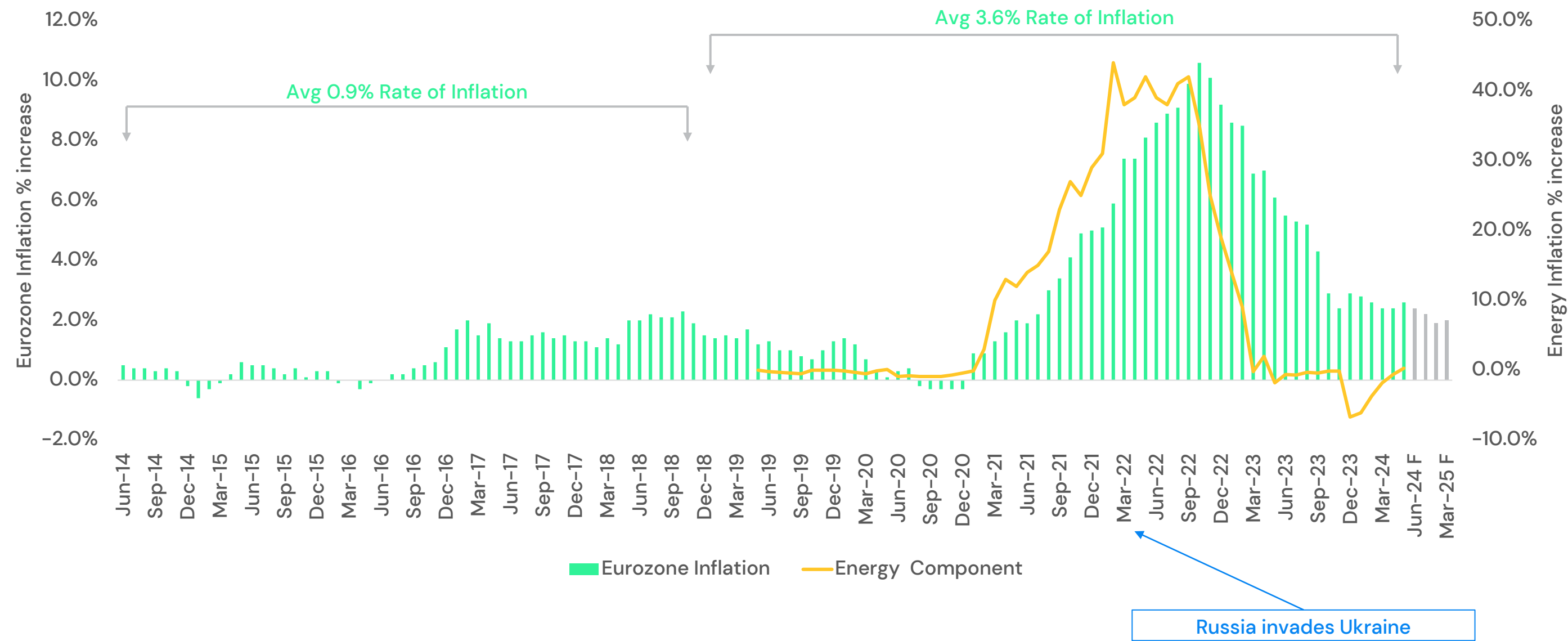


Key points and residual impacts of the war

- Now coming up to 2 years since Russia's invasion of Ukraine, the conflict shows no signs of slowing.
- U.S. and EU sanctions have damaged the Russian economy but also impacted global markets as western economies remove their reliance on Russian energy supplies.
- While inflation has decreased following its peak in Q2 of 2022, it has still remained high through 2023, with Europe feeling the biggest impact. It has stabilised in more recent months.
- Russian airlines' flights have been banned from U.S. and EU airspace and a ban on aerospace equipment sales to Russian entities has been imposed.
- All orders from Russian carriers were cancelled immediately and leases terminated. Going forward, future fleet growth will stagnate as Russian carriers are unable to procure aircraft apart from Russian-built platforms.
- However, many Russian carriers are weathering the storm albeit with a lot of support from the government.

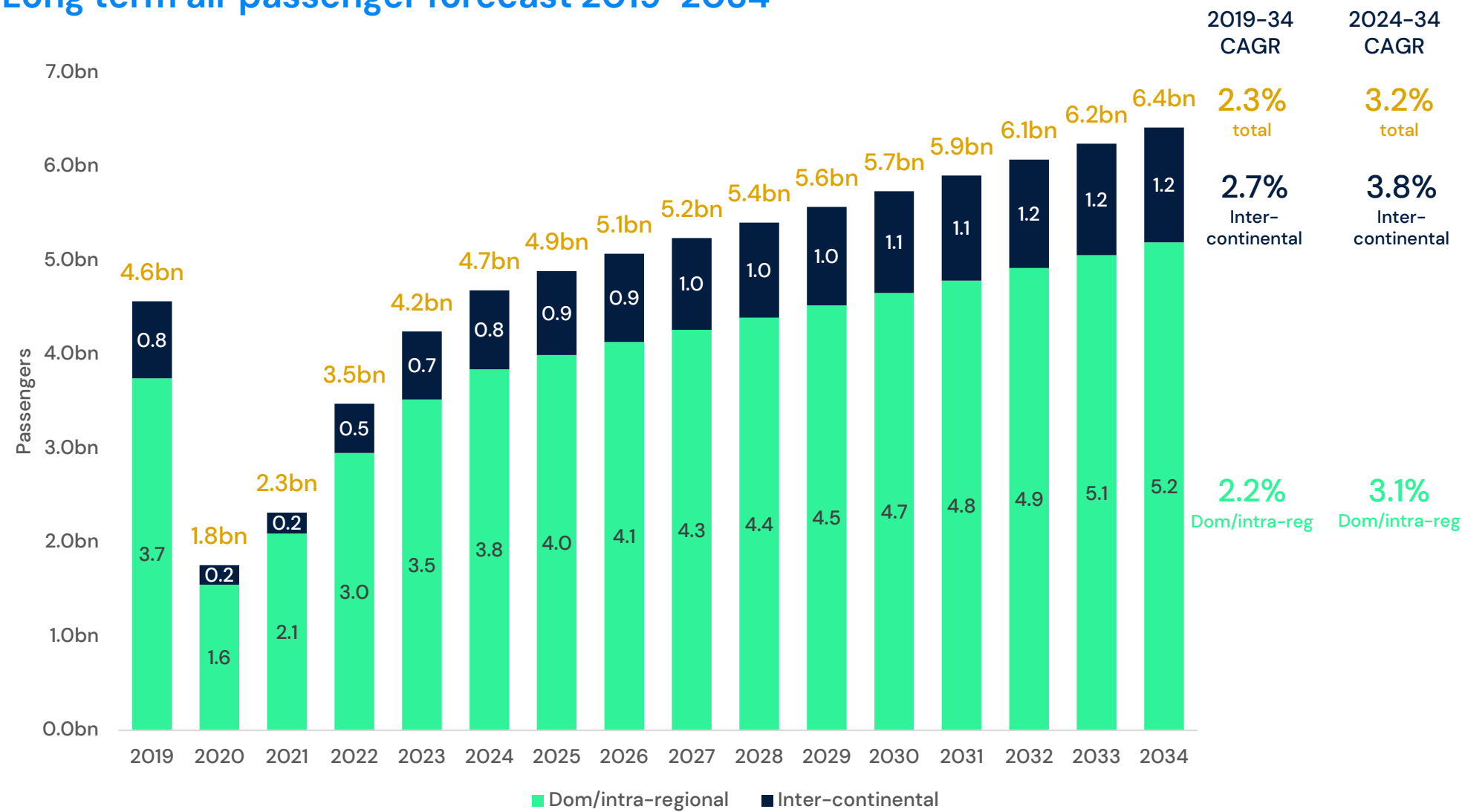
Eurozone historic **average inflation rate** has **quadrupled** in the last 5 years; Russia/Ukraine **war** had **worsened** impact on **energy prices**

Energy Inflation as a component of Harmonized Index Of Consumer Prices (HICP)



ICF expects air passenger traffic will grow at 3.2% CAGR between 2024–2034

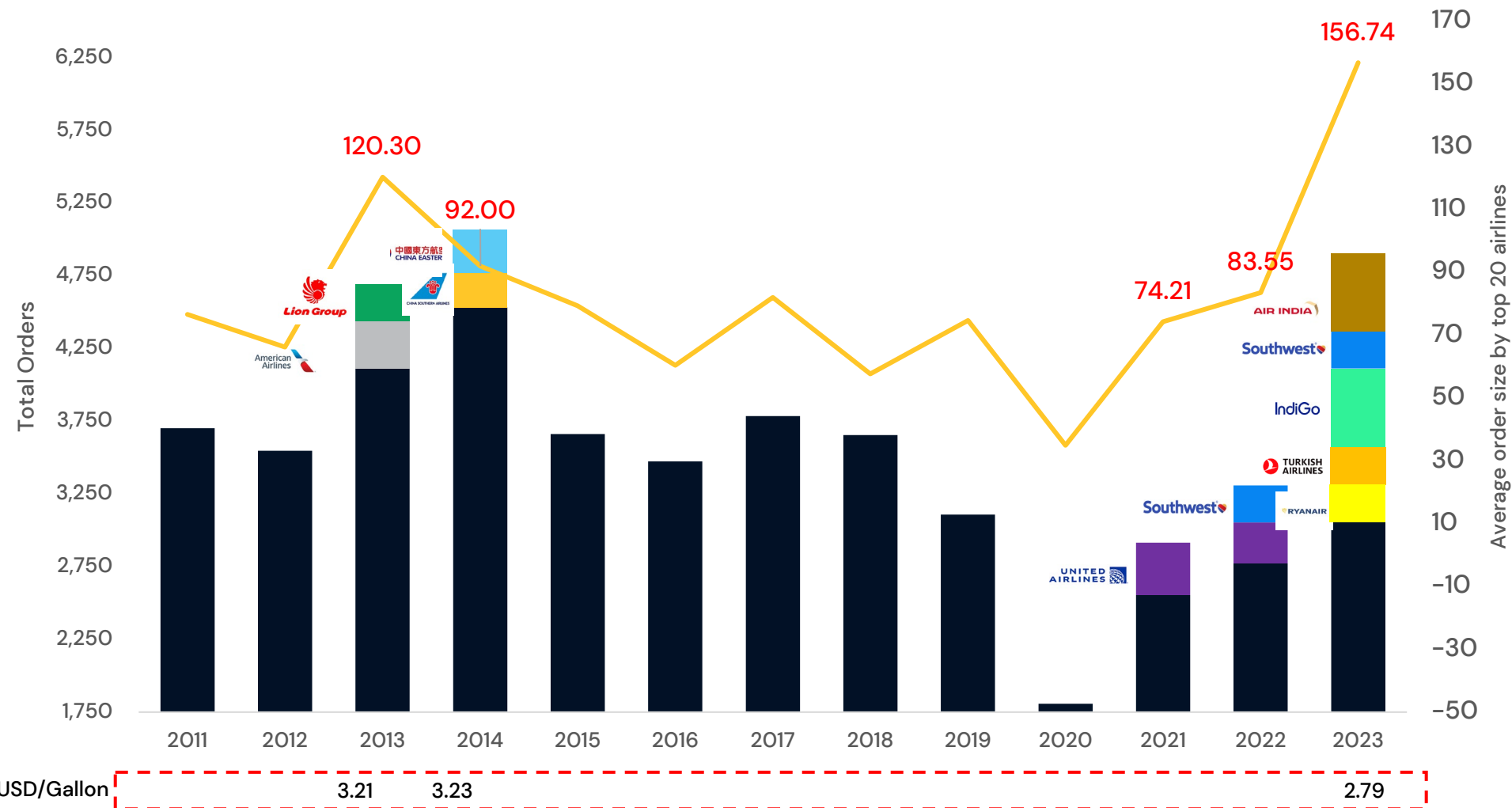
Long term air passenger forecast 2019–2034



- ❑ For the remainder of 2024, ICF views the industry recovery with **guarded optimism**.
- ❑ Based on macro-economic outlook, ICF expects global air traffic will grow at a rate of **3.2% CAGR** between 2024 and 2034 driven by **strong international** traffic from **North America, Asia Pacific and China**.

IATA expects industry net profit to reach \$30bn, the most profitable the industry has been in the last 5 years; whilst supply constraints hinder growth opportunities

Global Aircraft Orders

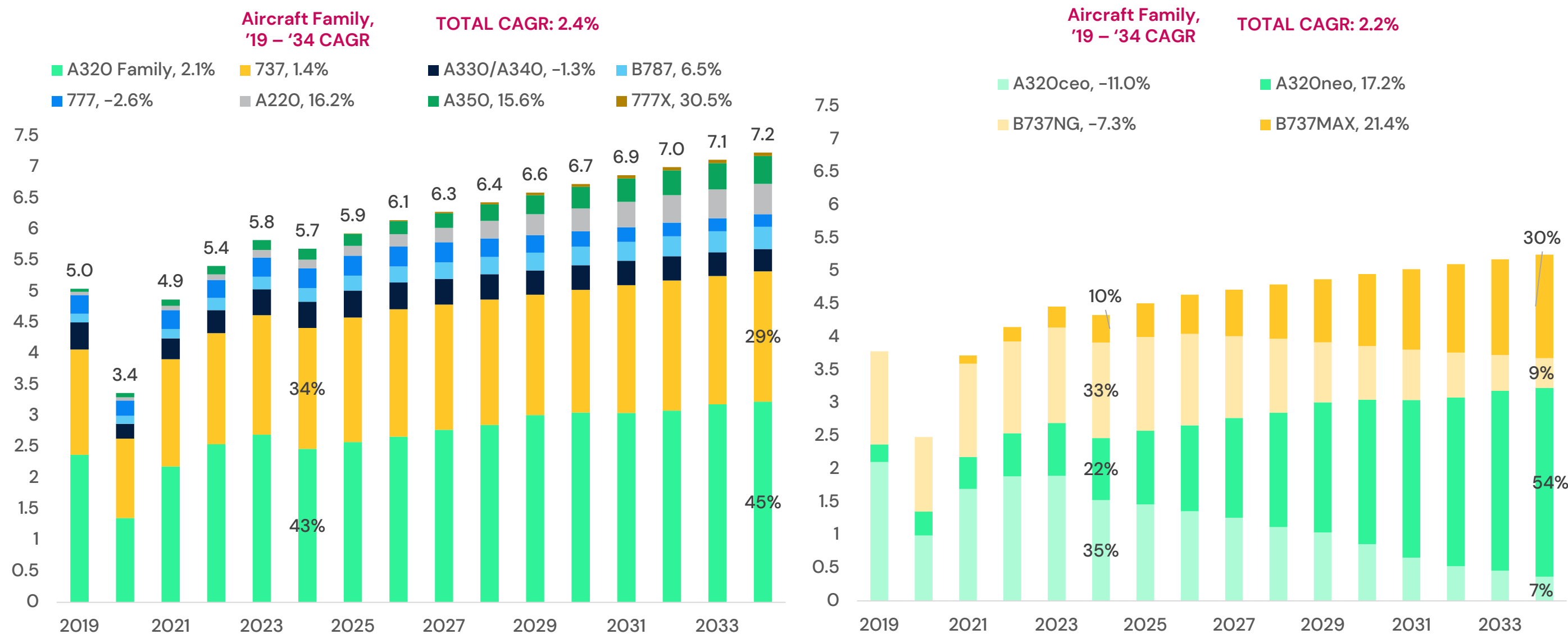


- ❑ Covid-19 has brought on supply chain constraints that prevent OEMs from increasing aircraft production rates.
- ❑ The byproduct of this situation is causing aircraft leases to be extended with lease rates for secondary aircraft to substantially increase.
- ❑ The subsequent impact is leading global airlines to place record breaking aircraft orders to secure pivotal delivery slots.
- ❑ 2023 witnessed a significant surge in new aircraft orders, with approx. 5,000 aircraft were added. This brought the backlog to an unprecedented all-time high of 17,000 aircraft.

Forecast suggest a **slow growth for Europe** in the next 10 years with the **A320 Family** consolidating its position as the **market leader** with a steady growth in market share

2019–2034 Europe commercial air transport fleet outlook

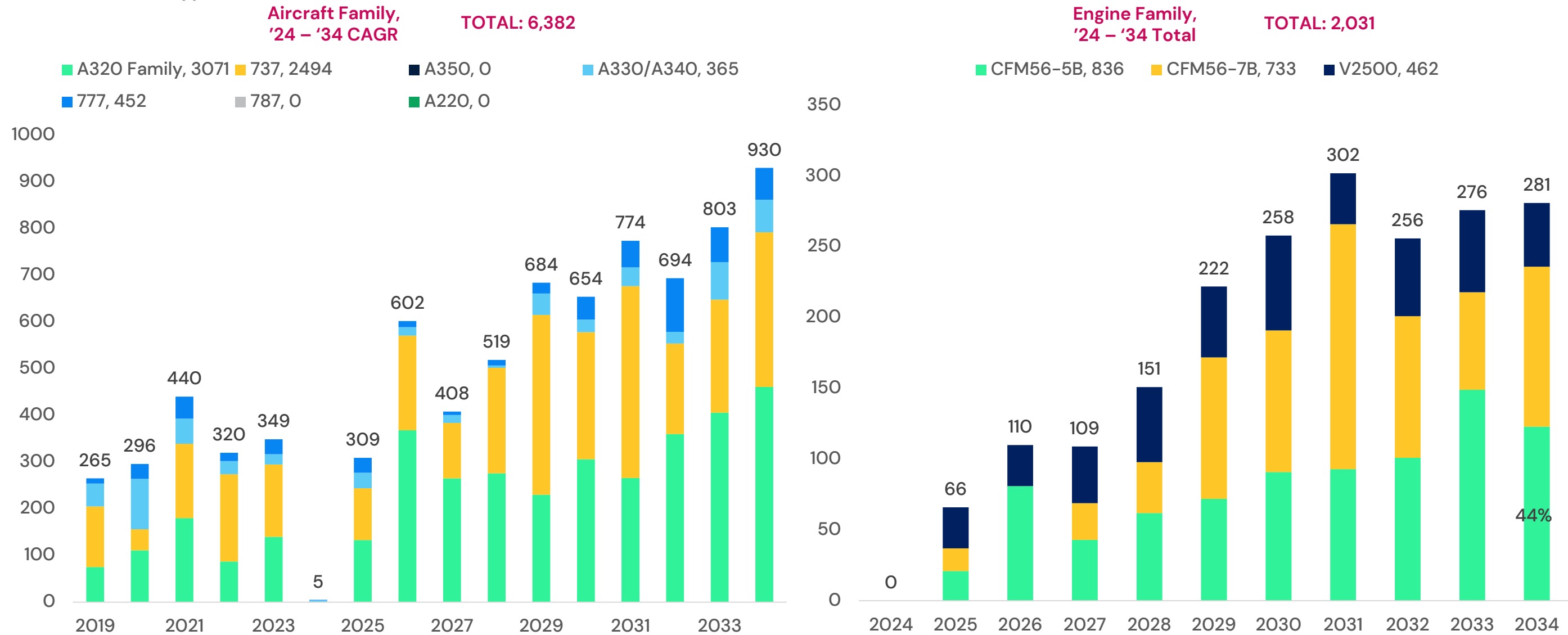
Selected aircraft families, In thousands



With a sudden demand recovery over the past few years combined with aircraft retirements in 2020 and 2021, airlines are likely to limit their retirements in 2024 to meet the demand

2019–2034 Europe commercial air transport retirements outlook

Selected aircraft types, In thousands



Favourable market dynamics for engine lessors: capitalizing on the passenger frenzy before it ends

Factors Driving Demand

1) Aircraft Utilization:

Passenger Demand: Increased aircraft utilization on the passenger side is a significant driver of demand for engine leases. Airlines require operational engines to meet passenger demand, minimizing downtime.

2) Spare Engine Shortage:

Delayed Aircraft Deliveries: Delayed production ramp up has significantly reduced the availability of spare engines, creating a supply shortage. This shortage has driven up demand and prices for both new tech and current gen engines.

3) MRO Slot Availability:

Maintenance Bottlenecks: MRO slot availability continues to be a significant issue. Limited MRO capacity leads to longer turnaround times, making leased engines an attractive option for airlines to maintain operational efficiency.

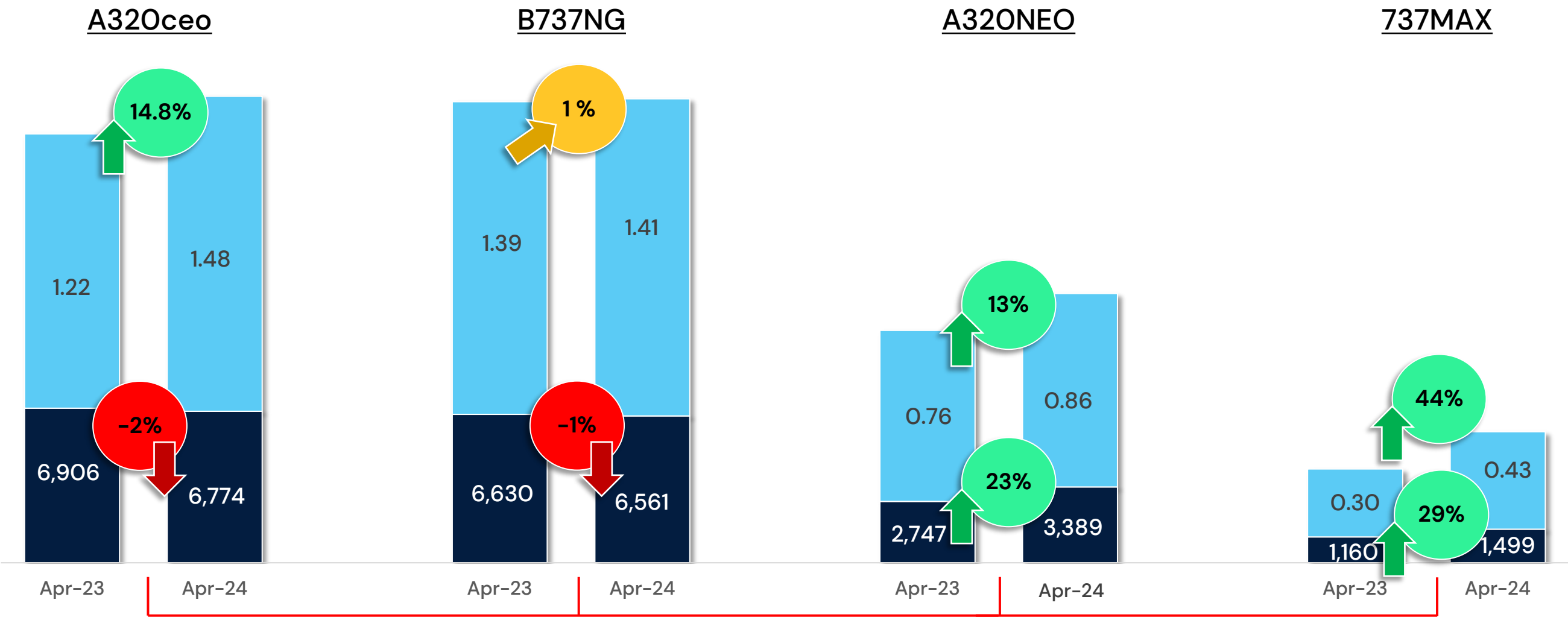
4) Issues with Newer Generation Engines:

Engine Reliability: Manufacturing issues with newer generation engines, such as the PW1100G, are driving demand for reliable and tested current generation engines

Engine utilisation has increased across narrowbody aircraft programs; current generation engines being utilised more as overall fleet reduces

In Service Aircraft Fleet & Engine Utilisation, Apr-23 vs. Apr-2024
Engine Hours Flown In millions

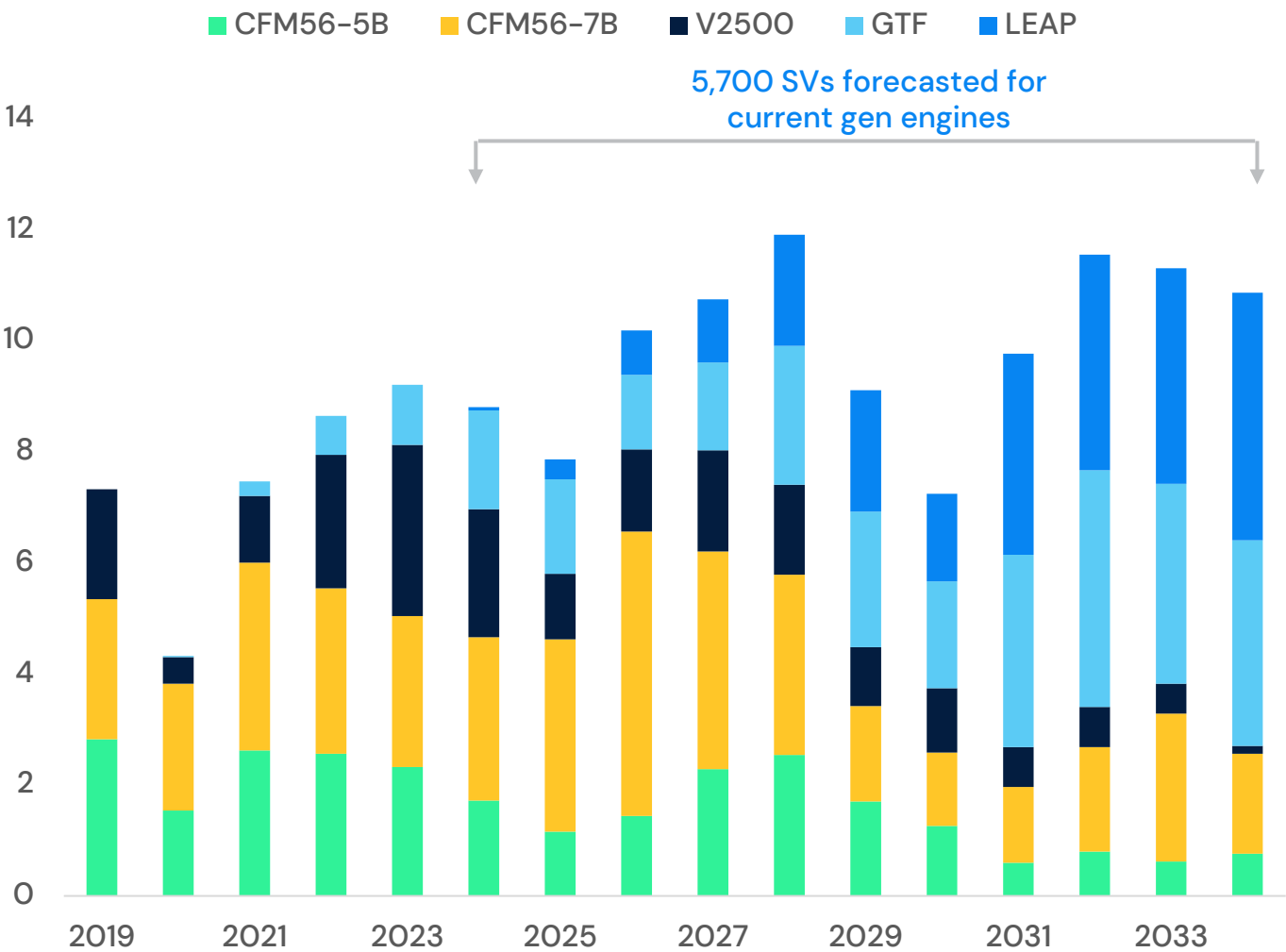
■ Engine Hours Flown
■ Total Fleet Size



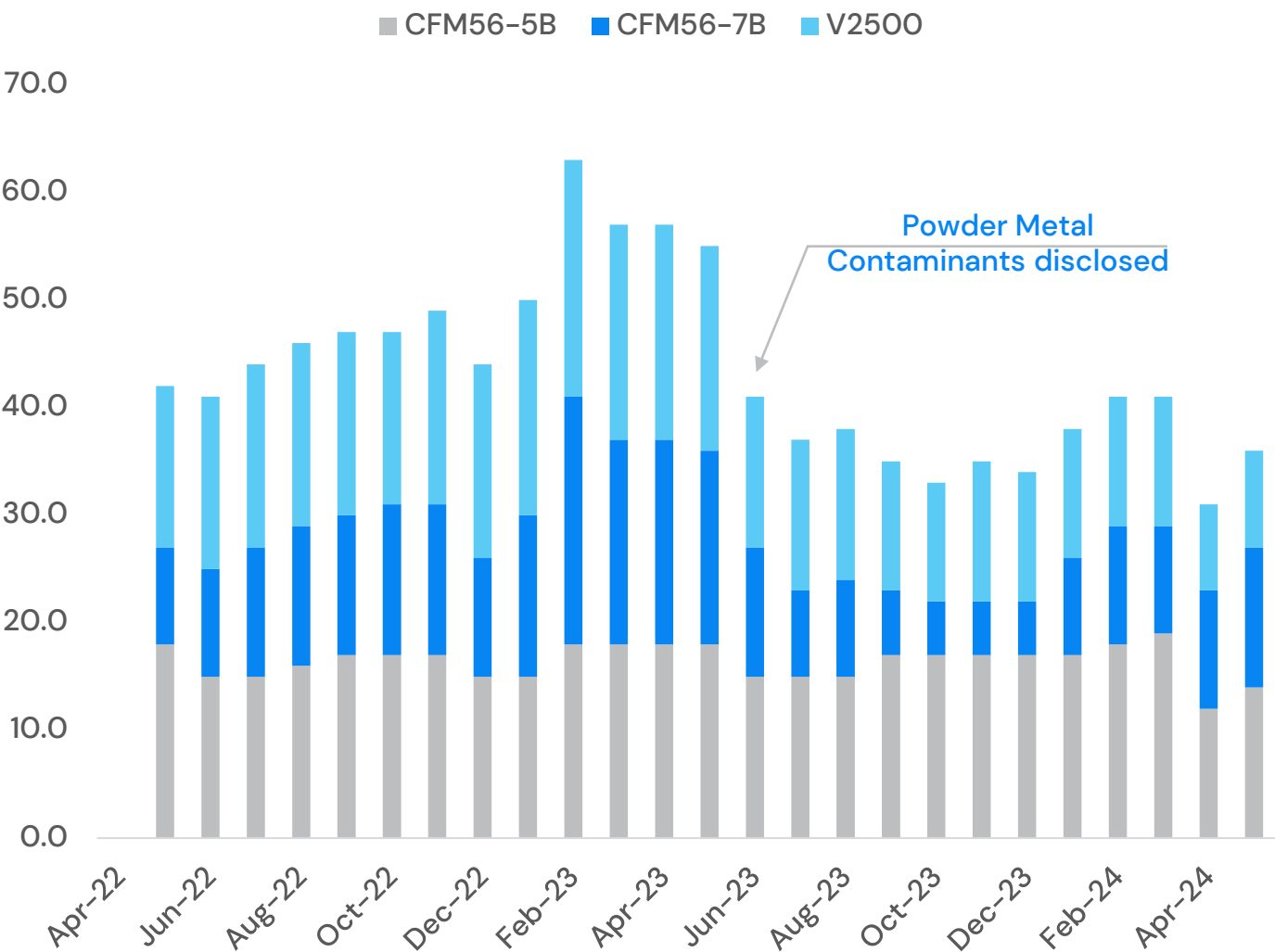
Percentage change in Fleet & Utilisation

Engine Shop Visit TATs have reduced to 5 – 6 months lead times, albeit still above the pre-pandemic levels; ICF expects approx. 11,000 SVs in Europe with 52% for current gen engines

Europe narrowbody engine shop visits per year by engine type
In hundreds



Current generation engine market availability

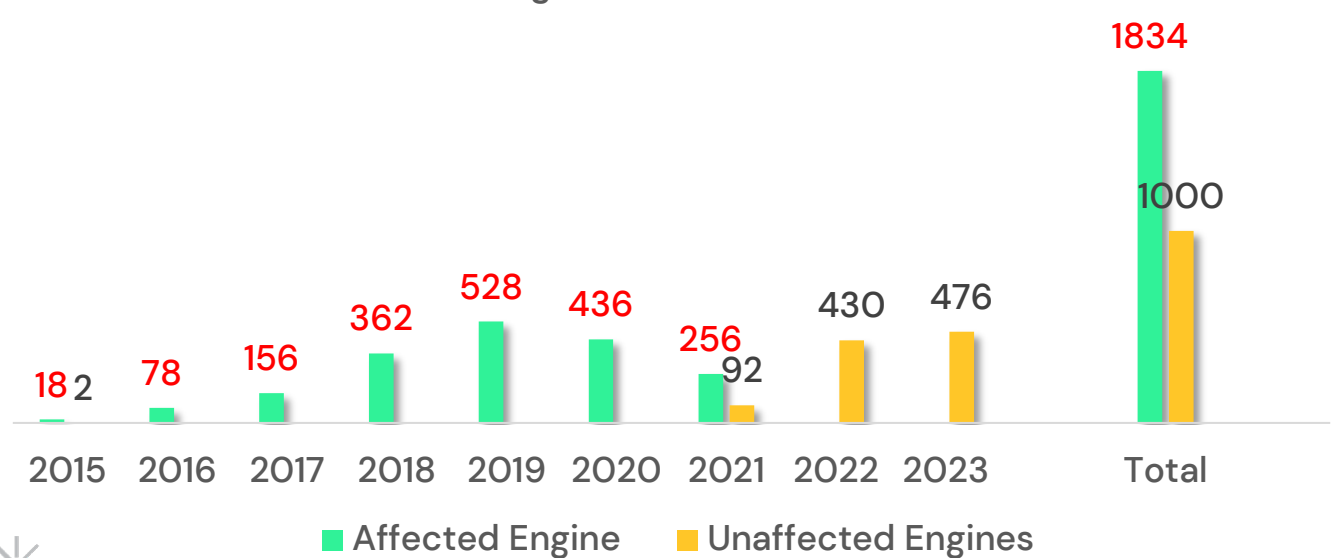


TAT times expected to take 250–300 days per engine possess significant operator risk; 650 AOG peak initially expected might have been overstated

Situation Twelve Months Ago ...

- Powder metal contaminants were found in the high-pressure turbine (HPT) stage 1 and 2 disks and high-pressure compressor (HPC) stage 7 disks. The problem was traced back to impurities in the parent material of the disks produced between Q4 2015 and Q3 2021.
- Repeat inspection protocol was established of approx. 2,800 to 3,800 cycles depending on thrust ratings.
- It's important to note that while the PW1500G and PW1900G engines have also been affected, their impact has not been as severe.

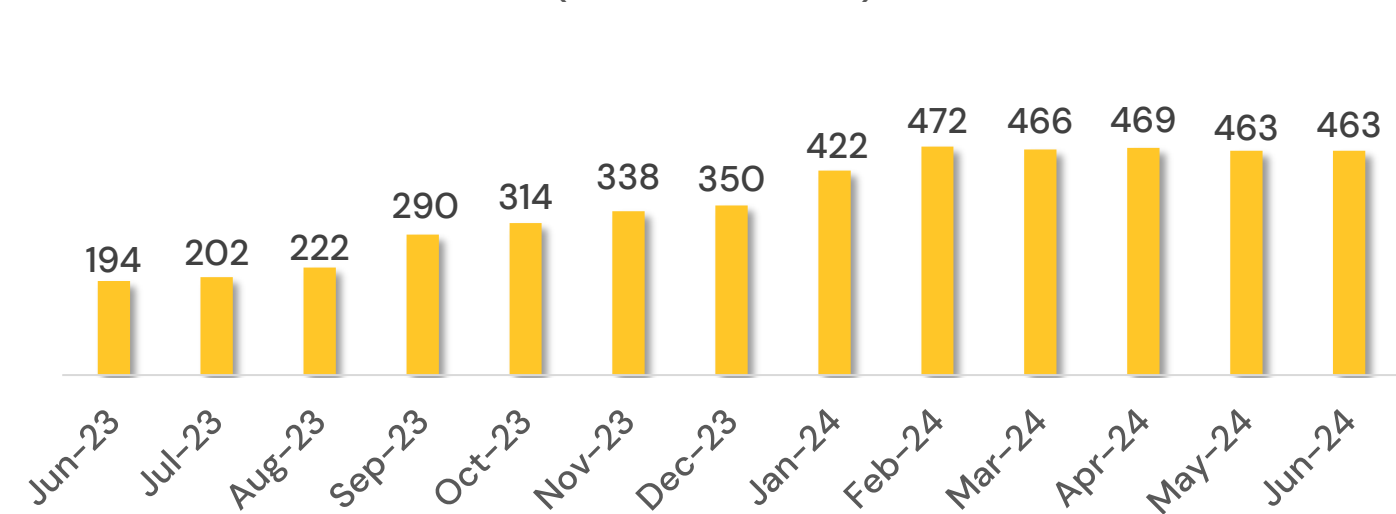
PW1100G Engine Deliveries (2015 – 2023)



Situation Now ...

- The AD note from August 2023 mandated the immediate removal of 136 engines by September.
- All affected parts are to be replaced with new parts as the supply chain permits.
- It's important to note that the power metal issue does not affect new engines from the FAL; and any newly replaced parts will not be subject to the repeat inspection protocol.

In Active GTF Powered Aircraft Trend (Jun-23 to Jun-24)



Source: ICF Analysis, CAPA Fleet Data

-7Bs owners are the real winners in the current environment; notable increase in -5B leasing activity; V2500 more in demand than -5B

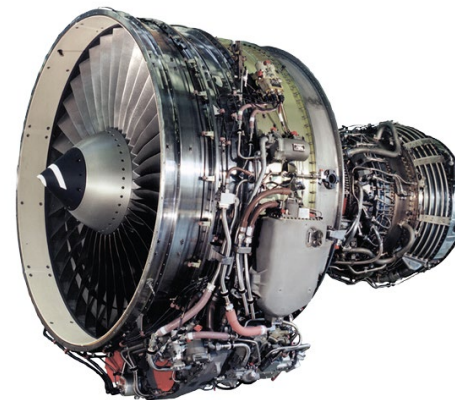
-7B

- Demand still increasing with usual premium for a single engine type aircraft program,
- Market lease rates are approaching their peak, reflecting strong demand and limited supply.
- Lease rates increased by 20% in the last 24 months to the last 12 months,
- Since then, rates have climbed further to \$100,000; a 67% increase in the last 12 months



-5B

- Limited engine trading transactions noted,
- There seems to be more leasing transactions taking place,
- Lease rates increased by 25% in the last 24 months to the last 12 months,
- Since then, rates have climbed further to \$75,000; a 50% increase in the last 12 months



V2500

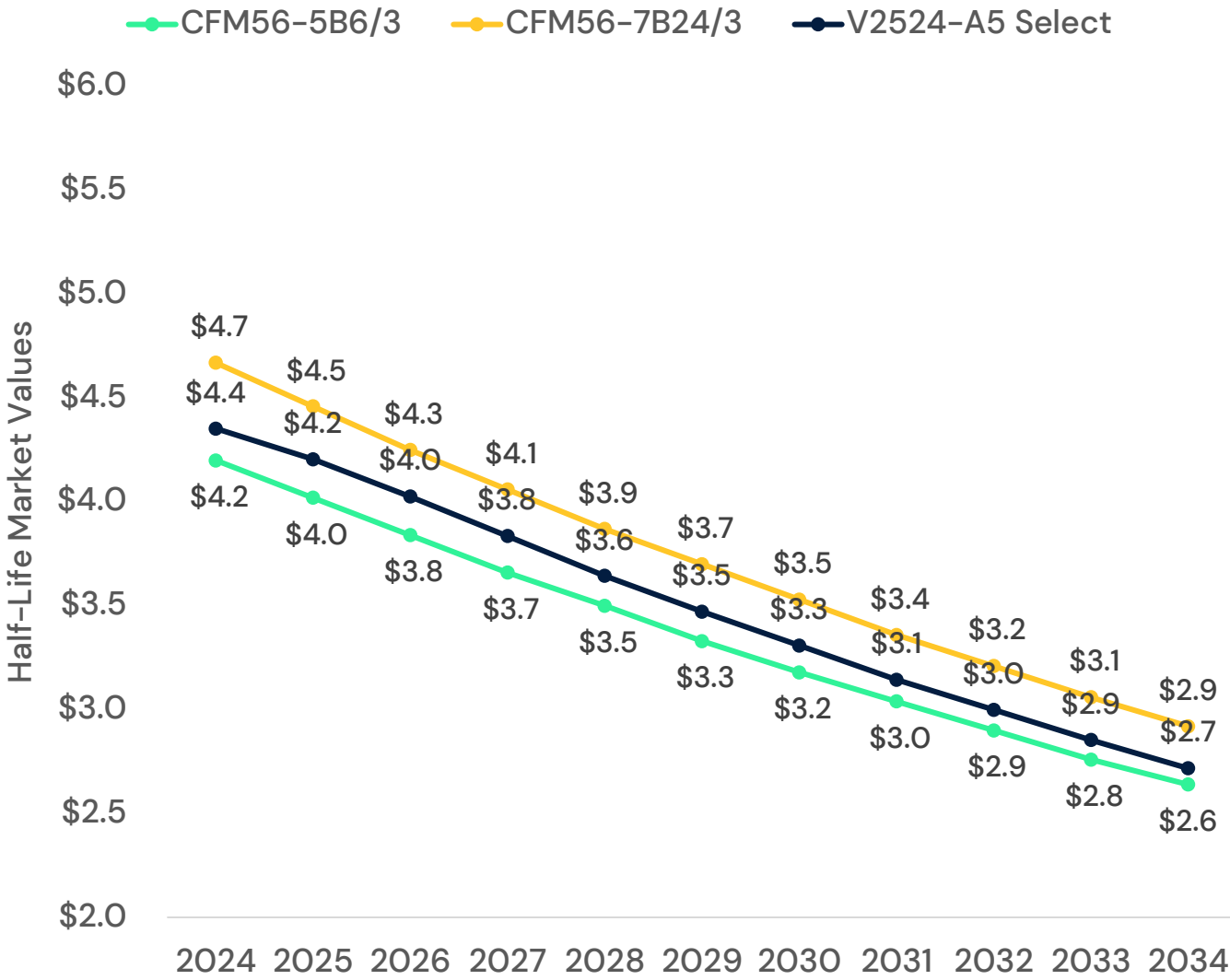
- As much as 600 HPT stage 1 and 2 hubs could be affected by the repeat inspection protocol; V2500 MRO capacity sufficient to absorb these additional shop visits,
- The market share between the V2500 and CFM56-5B engines is approx. 60/40. As a result, despite the impact of ADs and ongoing issues with GTF engines, the demand for V2500 engines has increased more significantly than for the 5B engines,
- Lease rates within the \$70K - \$80K range



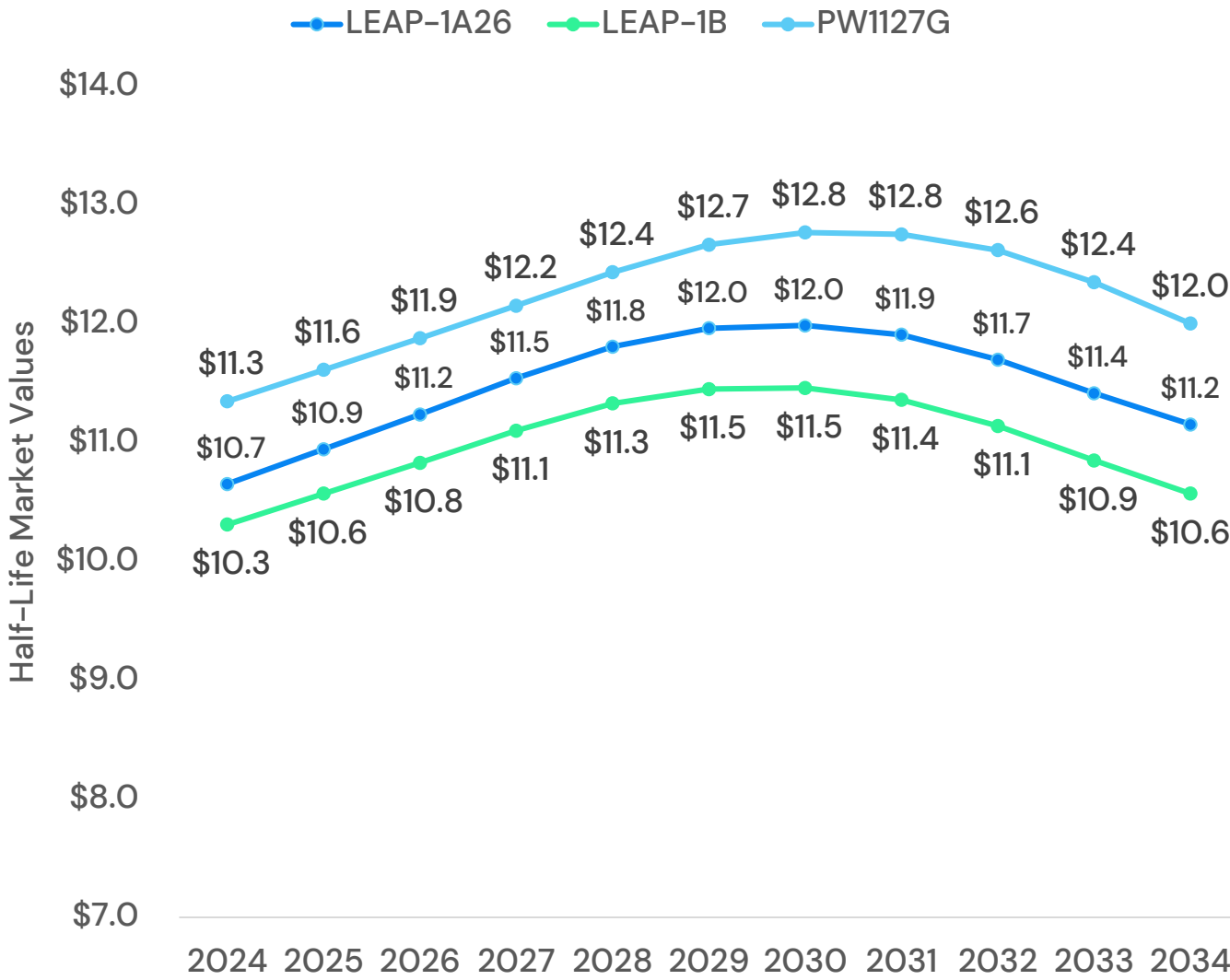
CFM anticipates roll out of new blades in 2025 and 2026 for the 1A and 1B respectively; GTF engine values holding steady

Values on the rise due to spare engine shortage

US Dollars In millions



Values mainly driven by OEM pricing and escalation



Key Takeaways

- **Spare Engine Supply Shortage:** The shortage of spare engines is likely to persist in the short to medium term. This scarcity tends to drive up market values of available engines due to increased demand and limited supply;
- **Increasing Shop Visit Demand:** There's a growing demand for shop visits, which puts pressure on the supply chain;
- **Quality Issues:** Ongoing quality issues in engine manufacturing for new tech engines. These issues affect the market for current generation engines;
- **Lease Extensions:** Lease extensions are becoming more prevalent, offering operators continuity of services and guaranteed lift. This trend reflects operators' efforts to maintain their schedules amidst a very robust demand environment;



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