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Most awarded Aviation 100 Appraiser of the Year
Largest team of ISTAT Certified Appraisers

DRAFT

Regional Demand Recovery Outlook
What the data is telling us

29 September 2021

ICAO Webinar on Air Transport Data and Analytics

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CIRIUM

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Agenda

- **Cirium Introduction**
- **The state of the market**
- **Recovery and challenges**

Powerful data, advanced analytics and open-system – it's in our DNA

RELX

A global provider of information-based analytics and decision tools for customers.

$10bn revenues

$40bn+ market capitalization.

180+ countries served

75%+ Fortune 500 as clients

30,000+ employees in **40** countries

Group

Risk & data services

High growth analytics supported by Big Data

$2.8bn revenues**, 8,700** employees

5 petabyte HPCC open-source big data platform

Leading world positions: agriculture, aviation, banking, finance, insurance, law enforcement, national security & petrochemicals

Legal

Scientific, technical & medical

Exhibitions

Divisions

LexisNexis RISK SOLUTIONS

Aviation & Travel Sector

CIRIUM

LexisNexis

ELSEVIER

RX

Brands

We created a new data analytics powerhouse under a new brand

1909
Launched the world's first weekly aerospace magazine.

1985
Launched airline specific insights to airline C-suite with the title Airline Business.

1997
Created online news, a data service for aerospace and airports (formerly known as ATI).

2004
Expanded in aerospace with the most comprehensive technical fleet database (known previously as ACAS).

2011
Grew portfolio with the addition of aircraft finance services with historical fleet and valuations data with the acquisition of Ascend.

2014
Added historical airline schedules data to business with acquiring Innovata.

2016
The pioneer in global, real-time flight status data, FlightStats brought into the group. Expanded the group's offering with Diio's fares, traffic and schedules analysis tools.

2019
Launched new brand Cirium to take forward the full portfolio of smart data & advanced analytics for the wider travel industry.

2020
Added live flight and navigational data to the Cirium portfolio, bringing in initiatives for System Wide Information Management (SWIM), with Snowflake Software. Combined mission to free data from its legacy silos, helping it to flow more fluently around the air transport industry.

2021
Added machine learning technology with Migacore, which translates data from online news, search, social media, events and exhibitions into signals to predict real-world travel demand.

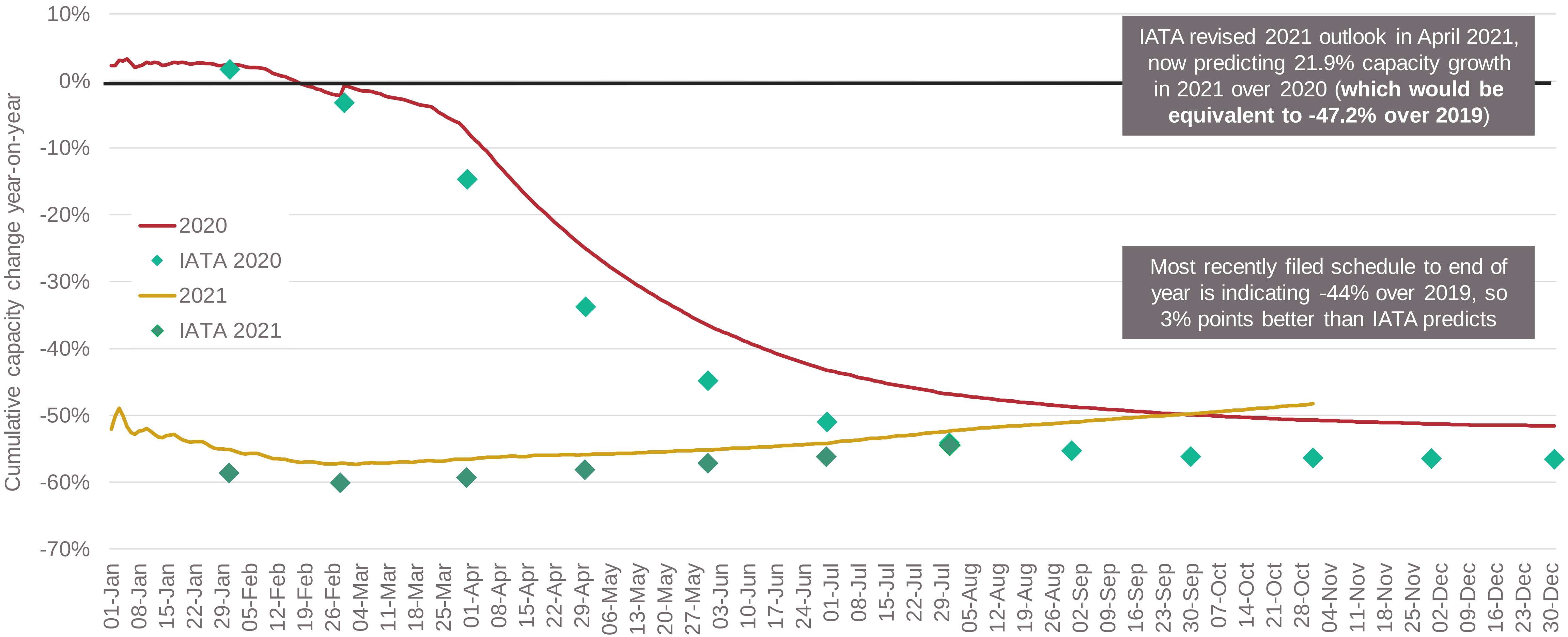
Our mission…

Accelerating
Digital Transformation

> *"We allow data to flow fluidly, making it available how, where and when it is most needed, regardless of the systems and services where it was created or will be consumed"*

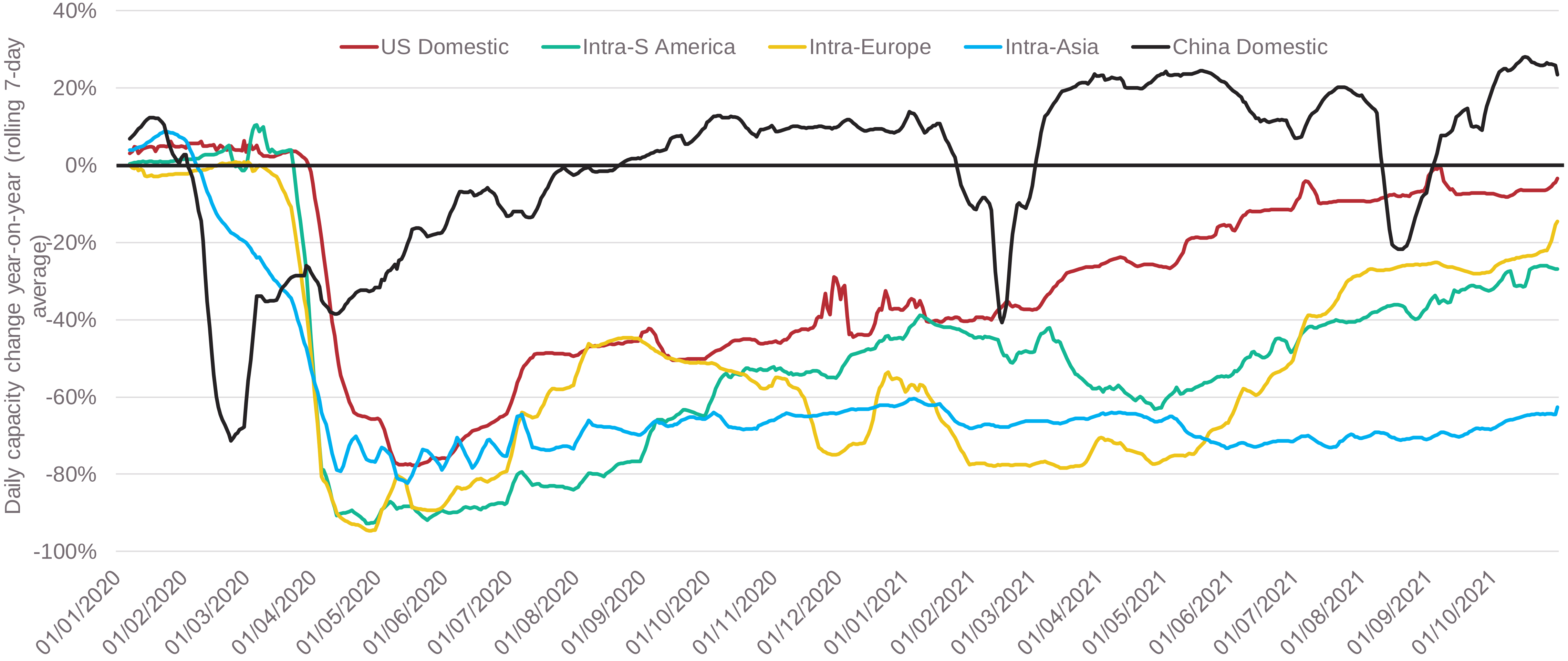
The state of the market

2020 global capacity down 52% cumulatively over 2019 (IATA data indicates actual position was 5% worse), 2021 was 57% down over 2019 by end March, recovering to -51% by end August and projected -48% by end October



Source: Cirium Schedules, data filed 19 September 2021, 2021 change is over 2019 equivalent, IATA 2021 change is estimated from IATA monthly traffic reports

China domestic showing recovery following significant decline in August, US domestic market also projecting improvement to only 3% down over 2019 by end October, Europe continues strong summer recovery into October, Intra-Asia remains >65% down through September



Source: Cirium Schedules, data filed 19 September 2021, 2021 change is over 2019 equivalent

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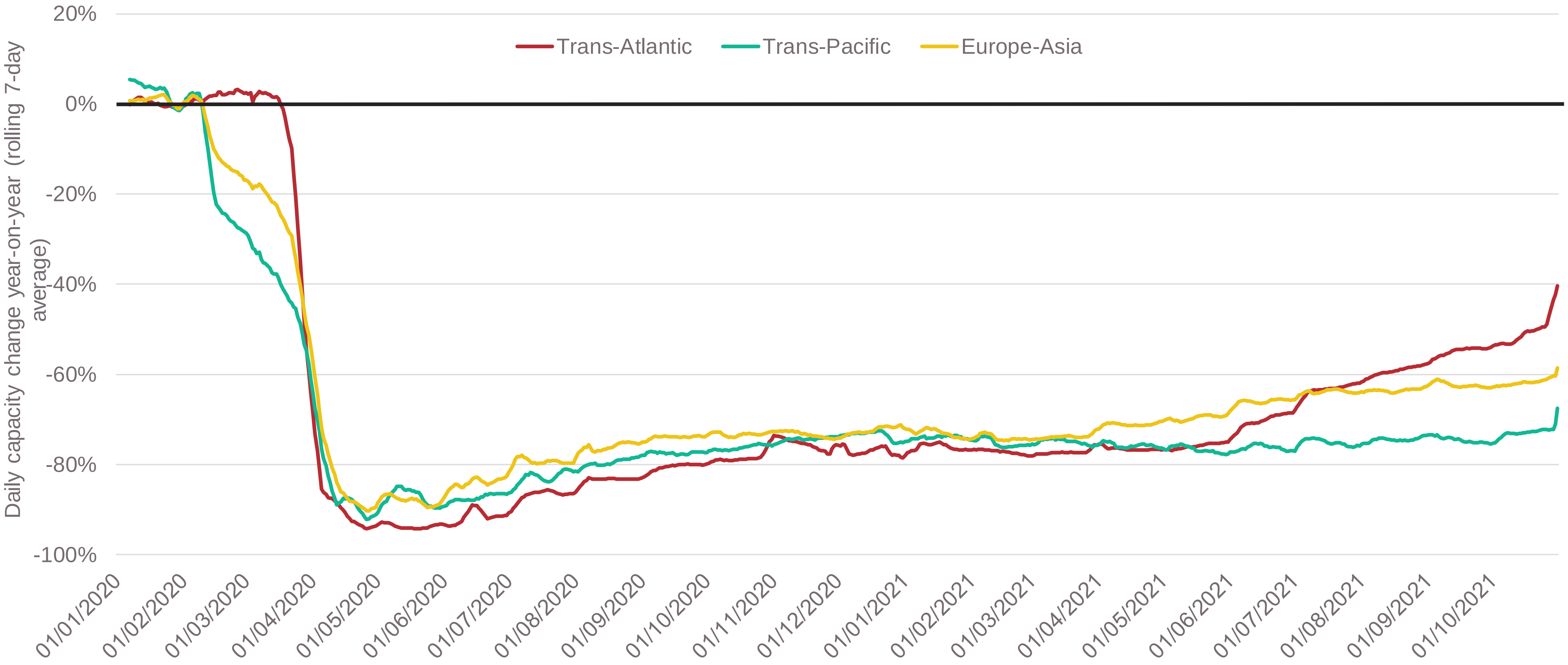
Long-haul all remained 60%-70% down over 2019 through end August 2021, Trans-Atlantic showing improvement through September and October, also slow improvement on Europe-Asia but all still down 50-70% by end September



Source: Cirium Schedules, data filed 19 September 2021, 2021 change is over 2019 equivalent

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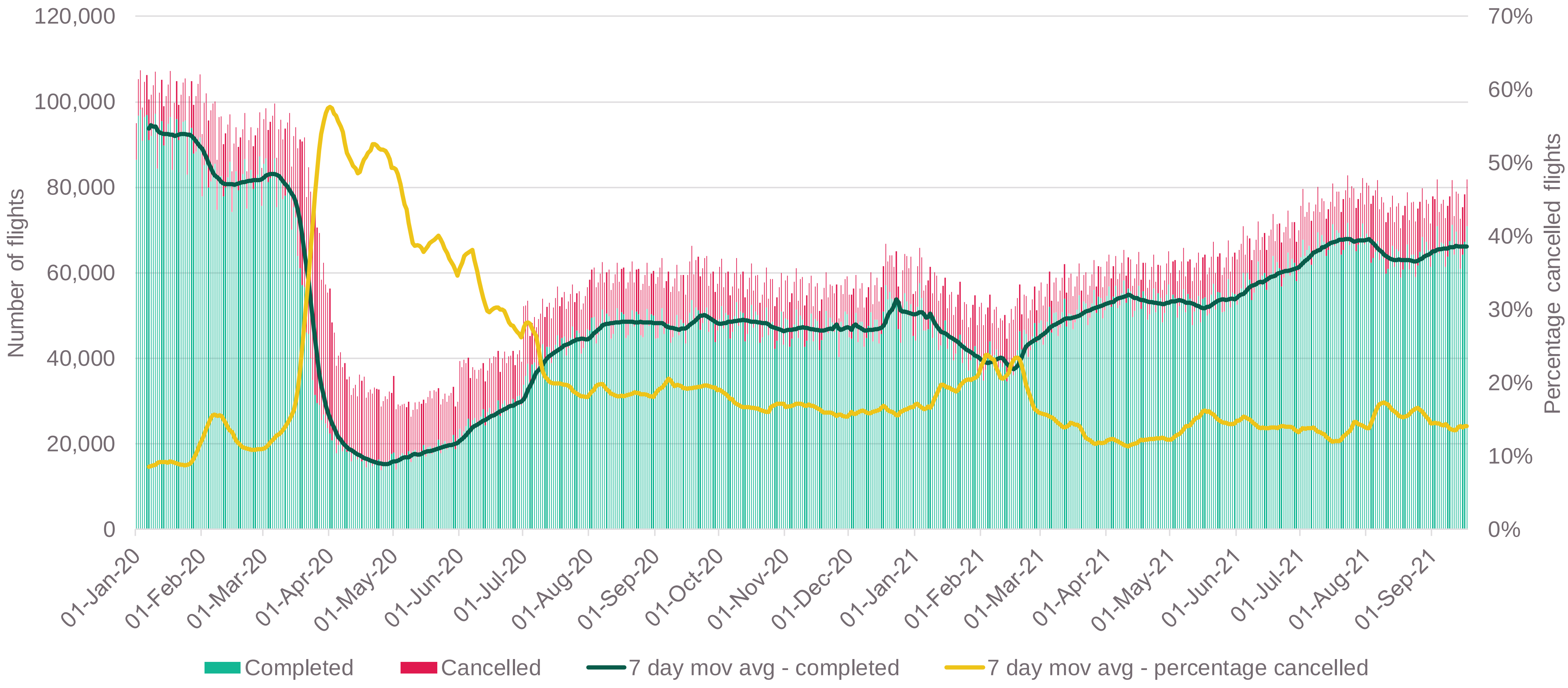
Global completed flights is back where we were a month ago, with no real change at the moment, nor any indication of improvement or otherwise.



Source: Cirium FlightStats Includes all global scheduled passenger flights

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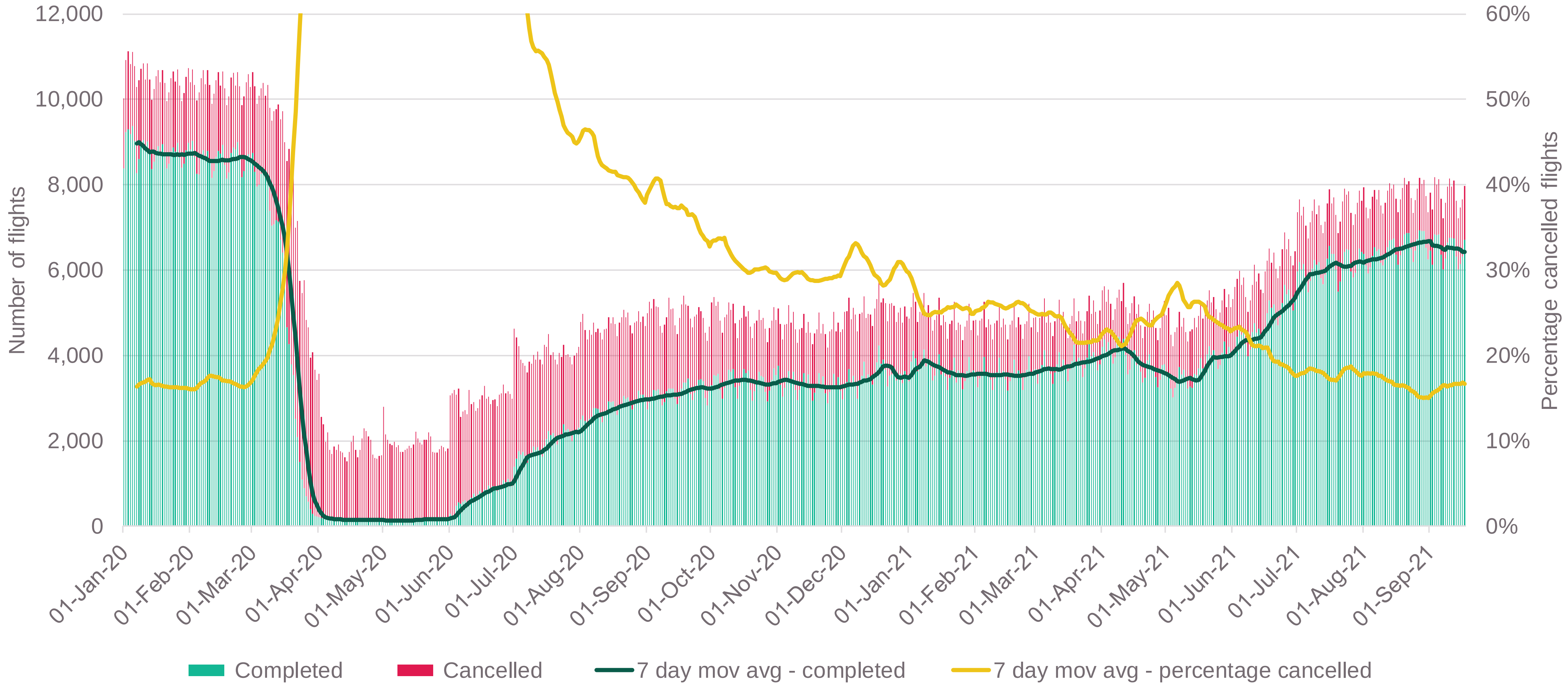
Middle East and Africa



Source: Cirium FlightStats. Includes all scheduled passenger flights to, from and within the Middle East & Africa

Note: the "cancelled" percentages in Asia-Pacific are higher than in the other three regions. This is primarily due to airlines in this region not updating their schedules as often as in the other regions, resulting in more last-minute cancellations or flights simply not flown in spite of being scheduled. The tracking coverage is also a bit lower in some parts of this region.

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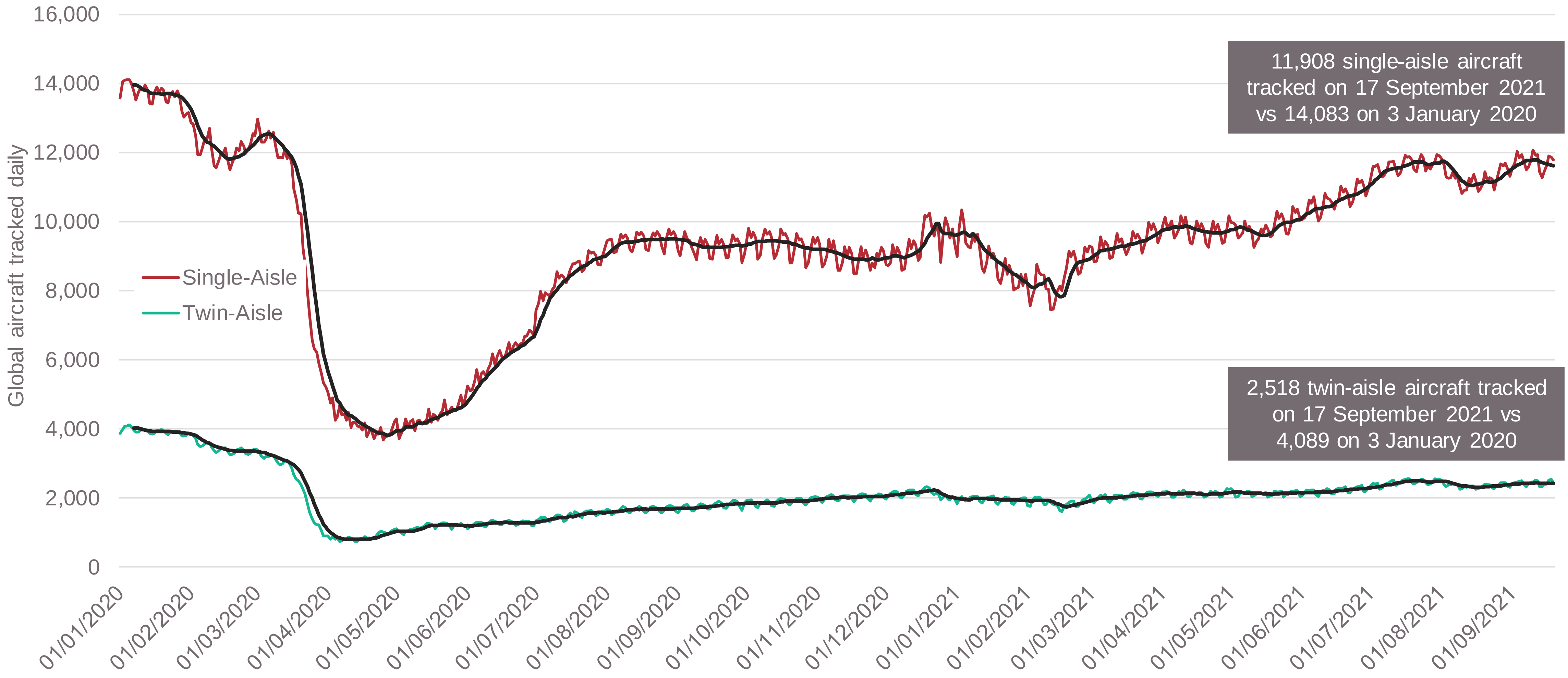
Fleet tracking starting to recover back to growth trend as China fleet increases again, marginal growth continues in Asia-Pacific (excluding China) this week, all other regions stable or showing marginal declines over last week



Source: Cirium utilisation data, commercial passenger jets, utilisation data for aircraft tracked on a daily basis only

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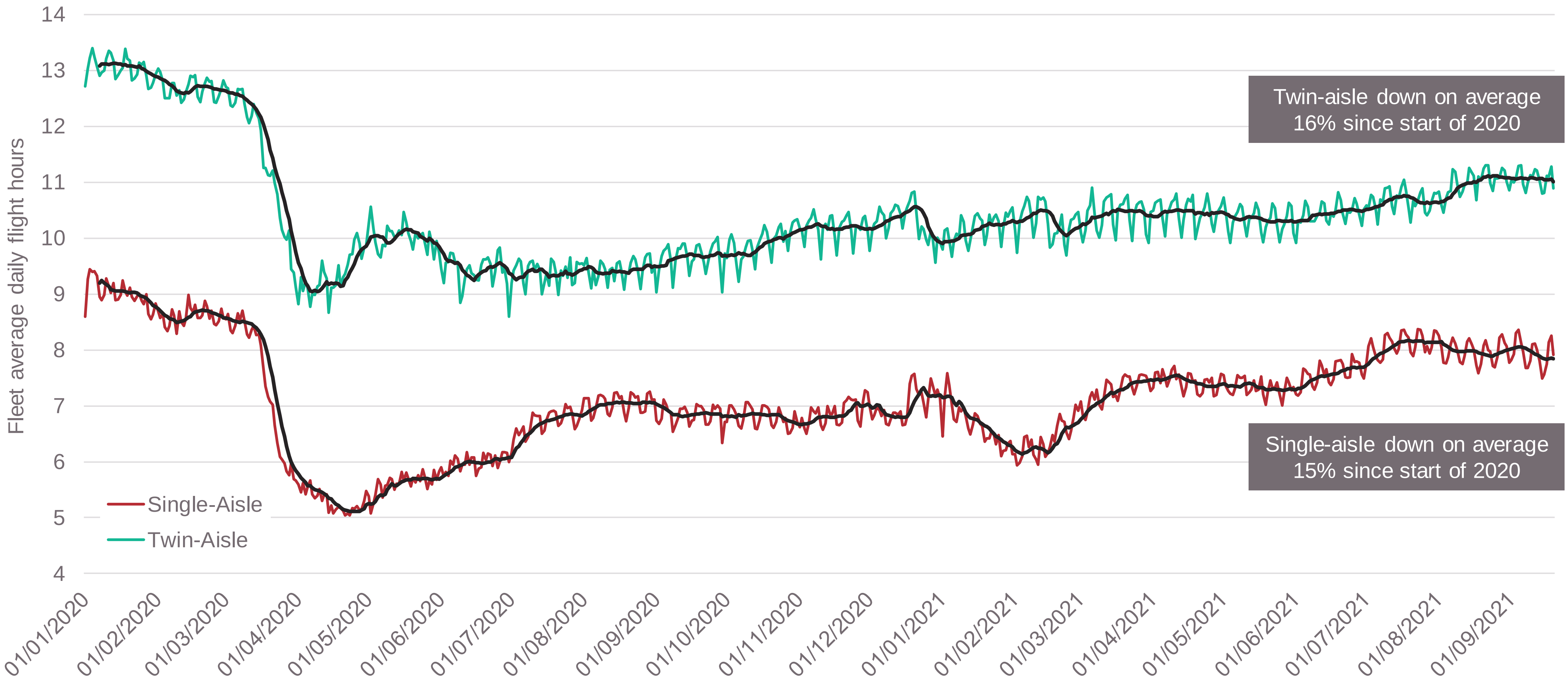
Average daily utilisation largely stable since early July



Source: Cirium utilisation data, commercial passenger jets, utilisation data for aircraft tracked on a daily basis only

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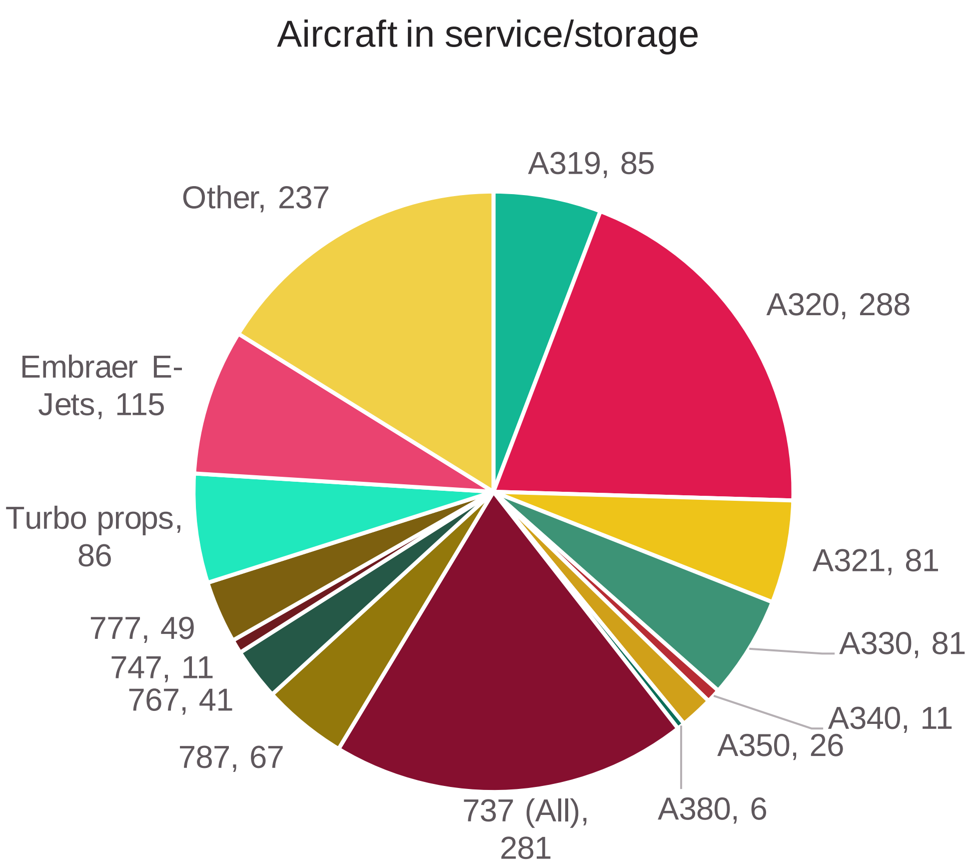
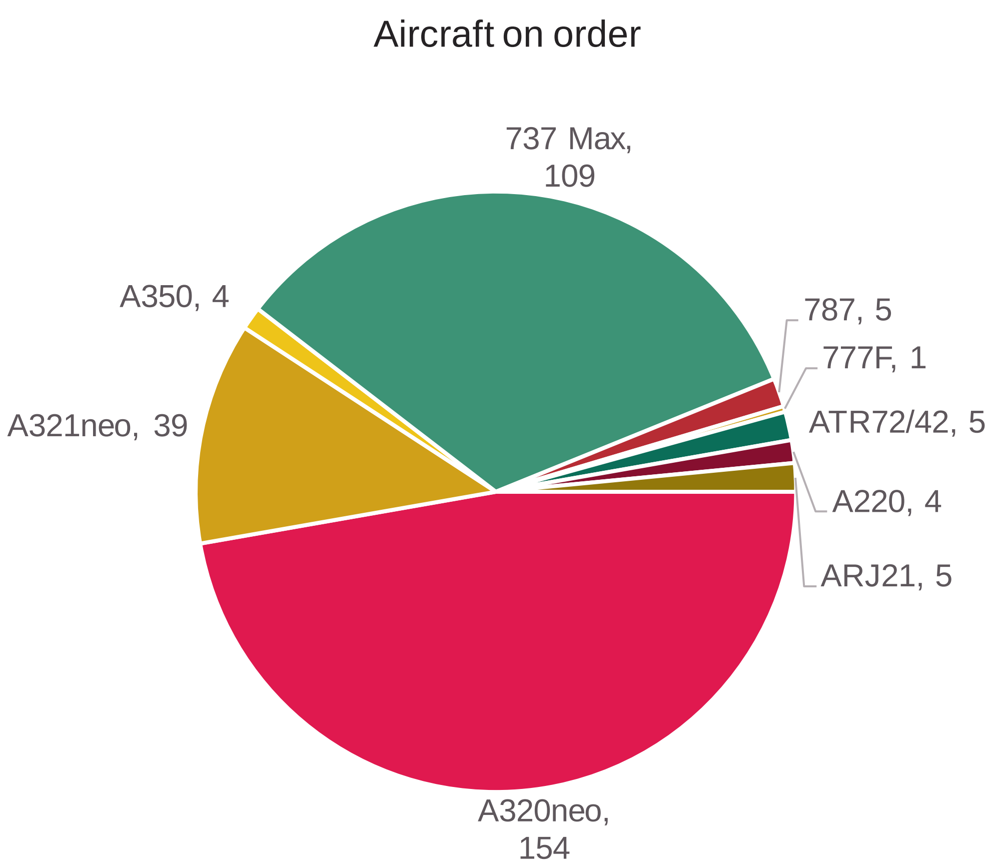
68 Airline restructurings and bankruptcies





Source: Cirium Fleets Analyzer

Note: this data only includes airlines quoted on the previous slide

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Recovery and challenges

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Three key factors driving demand for air travel and timing, scale of recovery

The Economy

Recession hits spending power

Customer choice

Business

Leisure

Permission to fly

Airlines

Passengers

← Uncertainty →

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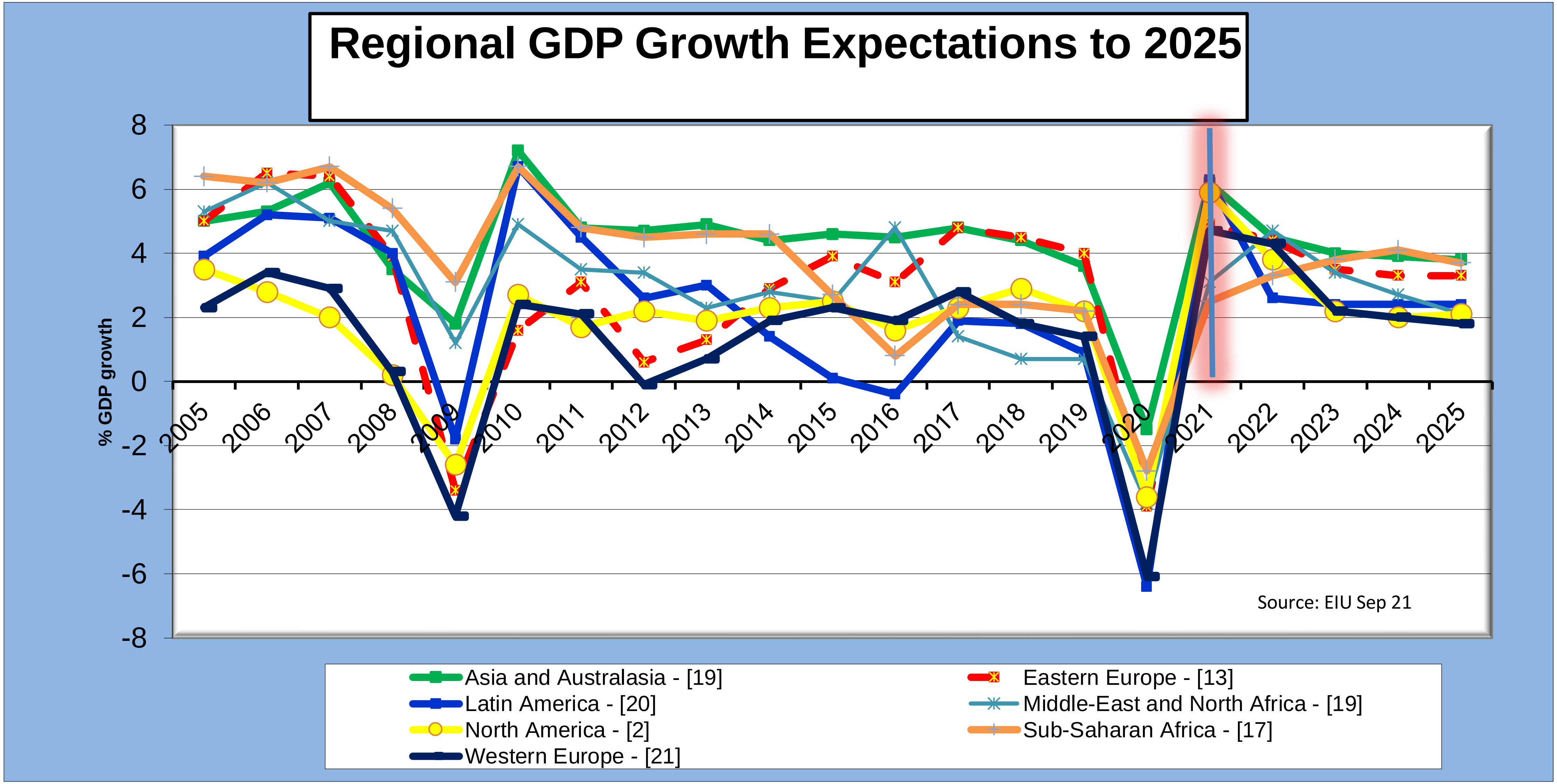
For GDP, a return to ‘Normal’ growth levels suggested, with Asia leading the way



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Signposts to scenarios

Issue	Signposts – timing/nature varies by scenario
Covid-19 scenario	Rate of new cases, Pace of vaccine roll-outs.
Economic forecast	GDP forecast levels, direction of change of forecasts, PMIs
Demand recovery	IATA traffic releases, Forward schedule, airline ASK announcements, flights flown, level of cancellations, Travel Agent survey
Travel restrictions	Timing of domestic, intra-regional, intercontinental easing. Timing of international travel within EU of particular note.
Airline environment	Airline bankruptcies, lease returns, market values and lease rates
Fleet surplus	Fleet in-service, utilisation levels, load factor
OEM production	OEMs maintain production at minimum viable rates, before slow recovery in deliveries from 2022

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‘Opening up’ scenarios based on >70% of adult population vaccinated

Date by when 70% expected to be fully vaccinated	**Countries – ranked by population/ASKs**
Now	Most of EU, UK, China, Brazil, Canada, Singapore, Israel, UAE, Chile
Q4 2021	USA, Japan, Mexico, Turkey, South Korea, Argentina, Morocco, Saudi Arabia, Malaysia, Australia, Ecuador, Cambodia
Q1 2022	Thailand, Colombia, Peru, Taiwan, Kazakhstan, Tunisia
Q2 2022	India, Indonesia, Russia
H2 2022	Pakistan, Philippines, Vietnam, South Africa,
2023 or later	Bangladesh, Ukraine, most of Africa, others

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Recovery to 2019 demand levels is not synchronous, but in both scenarios long-haul lags domestic and regional, driving at least two more years of sub-2019 demand

	Scenario 4	Scenario 5
Asia Pacific	May 2024	March 2023
Europe	March 2025	May 2023
North America	December 2024	September 2023
China	April 2023	September 2022
Latin America	October 2024	July 2023
Middle East	January 2025	April 2024
Africa	June 2025	March 2024
Russia/CIS	July 2024	June 2023
World total	**August 2024**	**May 2023**

Source: Ascend by Cirium Scenario Analysis, total market

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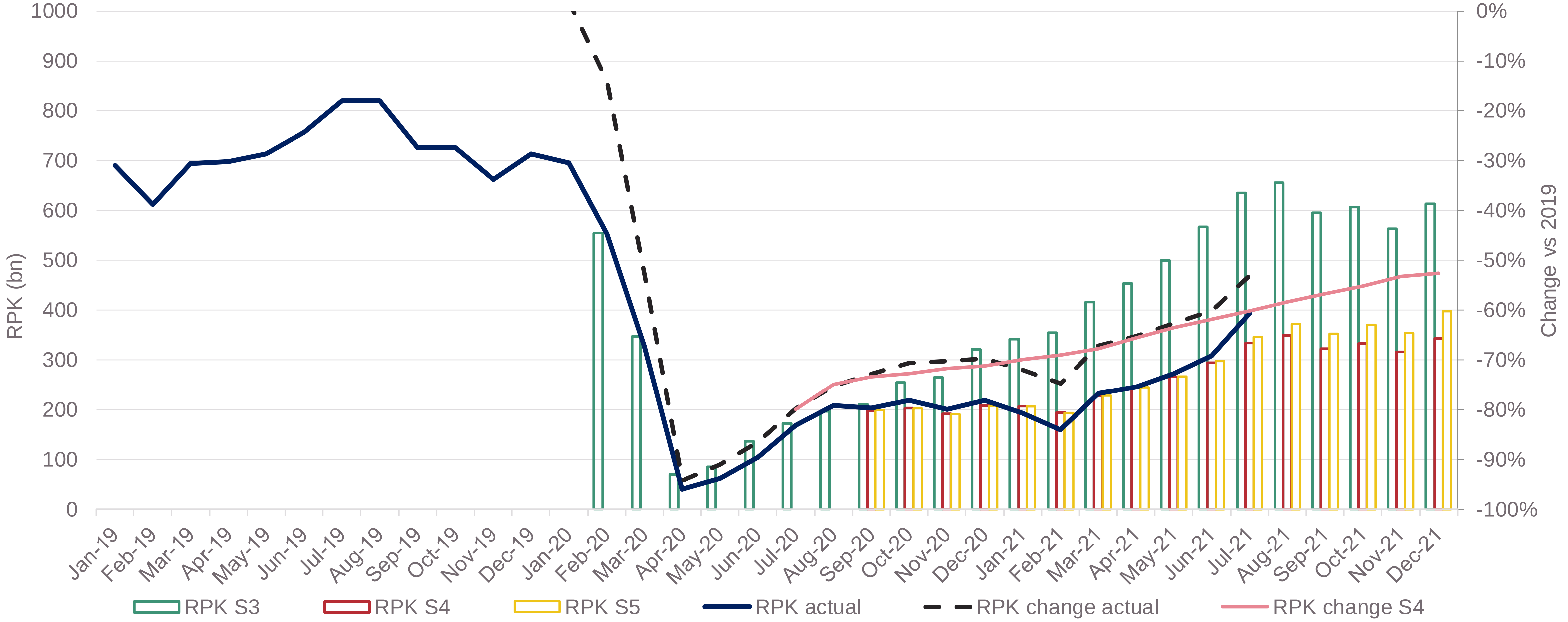
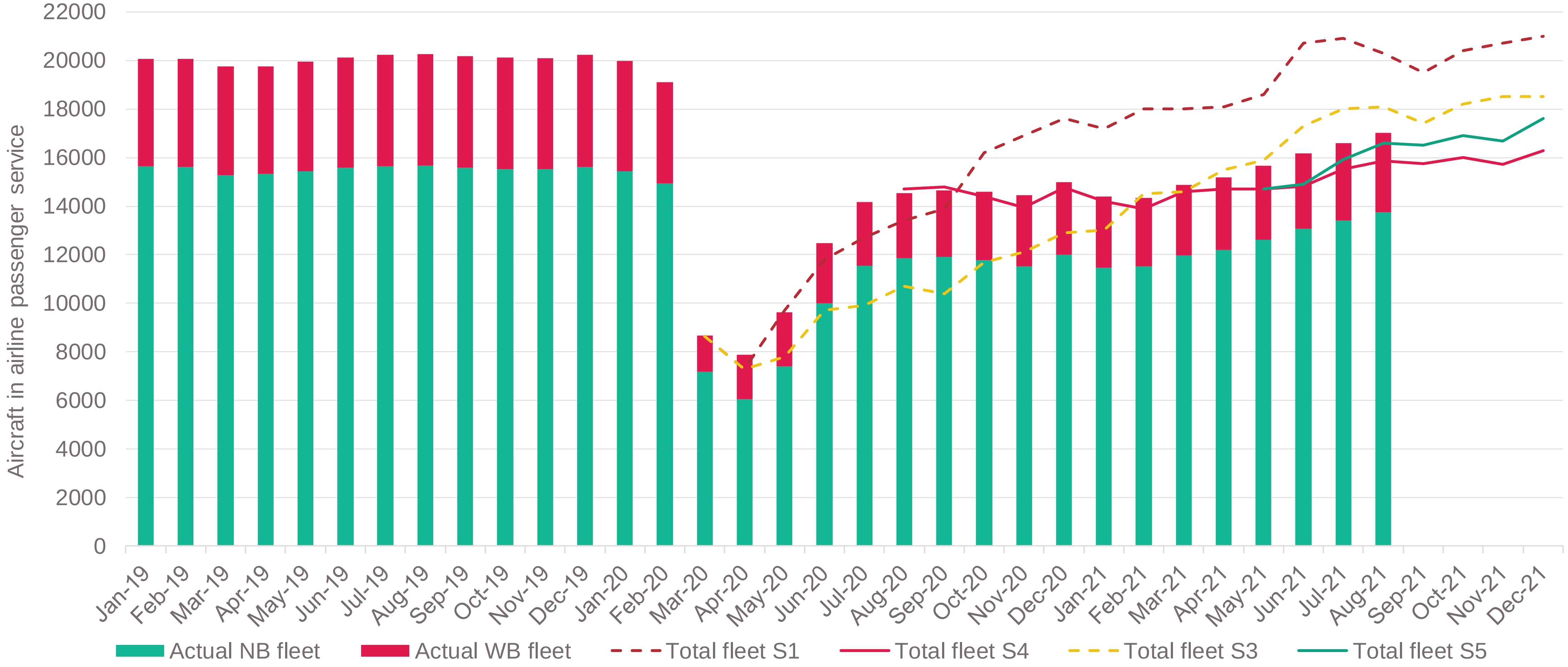
July 2021 RPKs down 53.1% vs 2019, a 7% point improvement on June, August expected to be down 52-56%



Source: Cirium schedules, Ascend by Cirium analysis, IATA (Load Factor)

Passenger fleet in service is increasing ahead of more optimistic recovery scenario (S5)



Source: Cirium Fleets Analyzer, Ascend by Cirium analysis

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Aviation Outlook

Conclusions

- GDP has been the key driver of long term airline traffic growth and remains so, but environmental concerns moving up agenda
- Covid-19 dramatically impacted GDP and traffic forecasts. In addition, consumer health concerns and government restrictions have reinforced the impact on aviation
- The reduction in passenger traffic seen in 2020, around 12 times the level of reduction in GDP, is completely unprecedented
- While GDP growth has turned positive in 2021, traffic recovery remains stilted
- Domestic and regional routes have recovered fastest
- Recovery of global traffic could be expected by 2023/4 but likely many different impacts will be seen on route networks
- The continued viability of many elements of the aviation and travel and tourism supply chain is still uncertain.

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7 ISTAT CERTIFIED APPRAISERS

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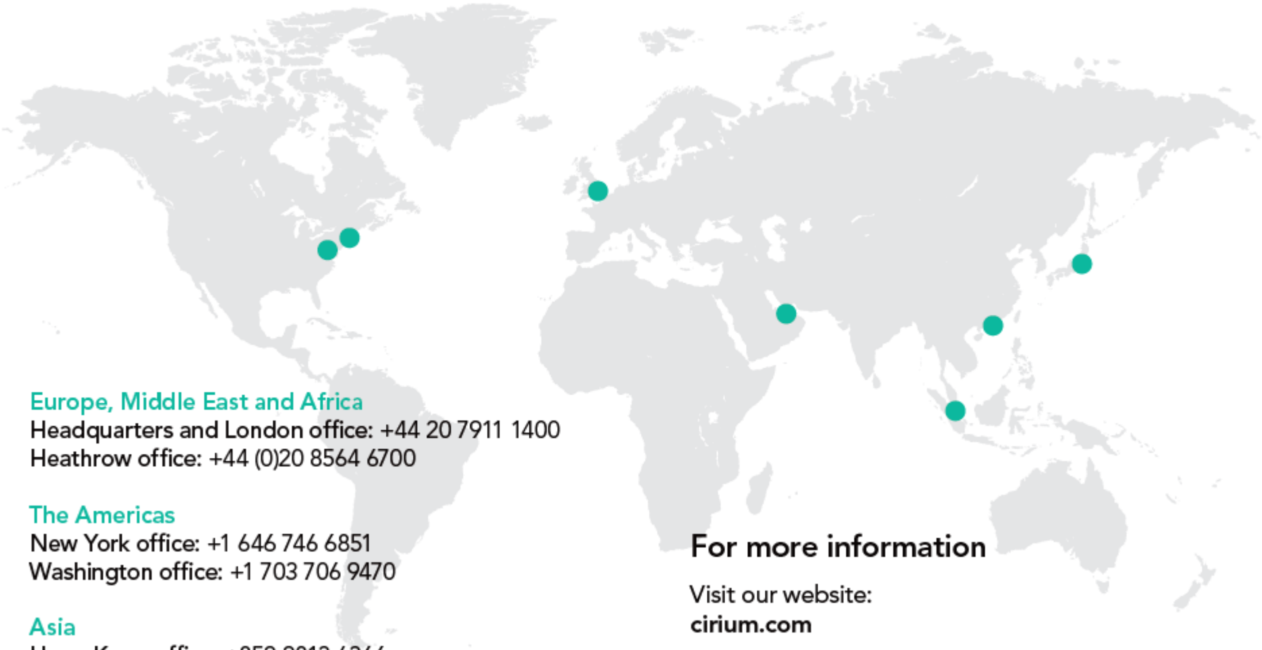

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