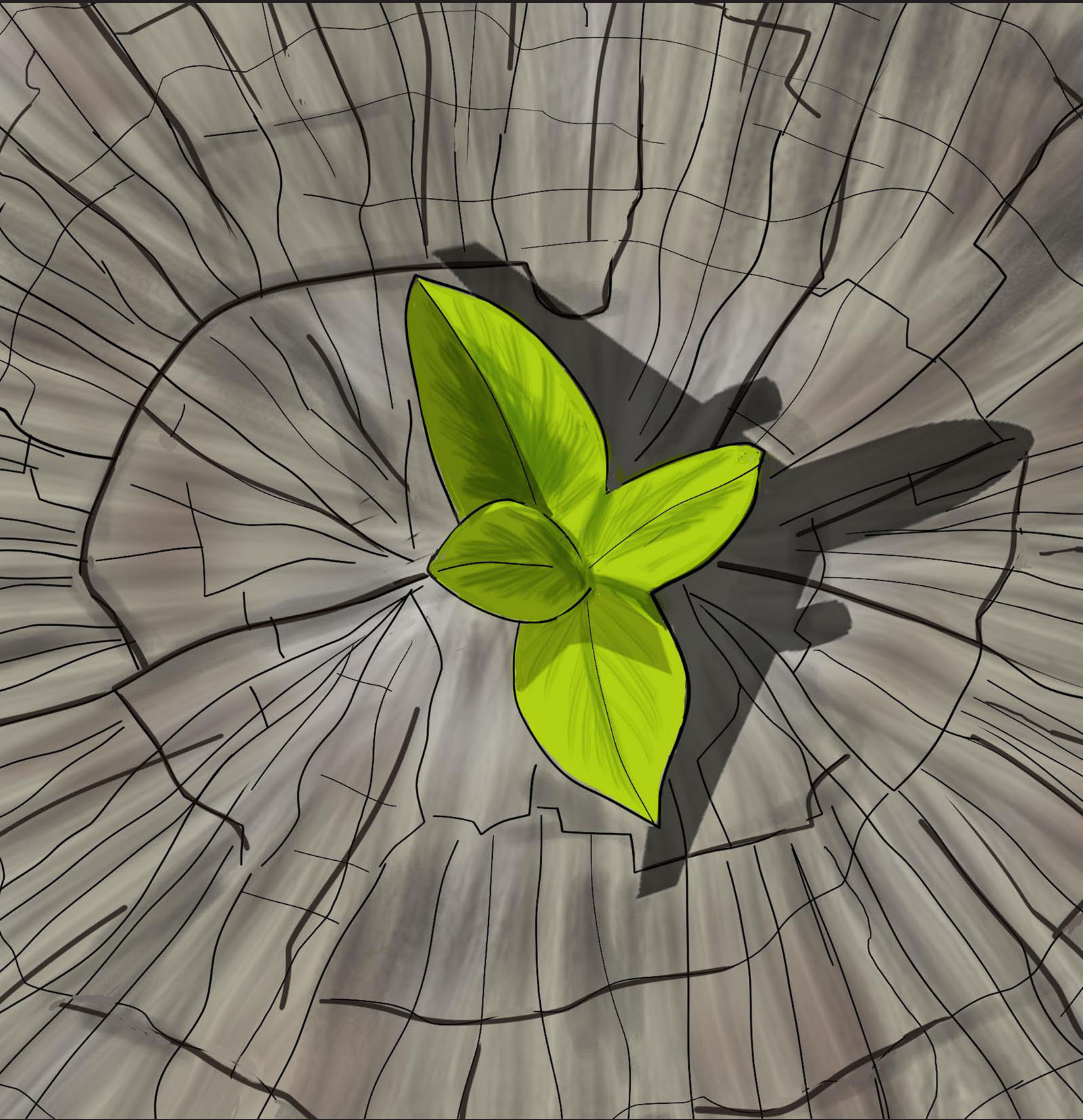
The Aviation Industry Leaders Report 2022:

Recovery through Resilience



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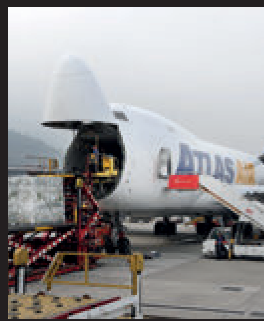

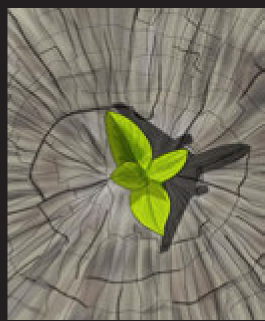

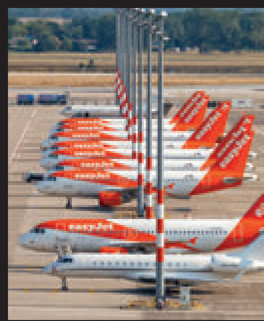

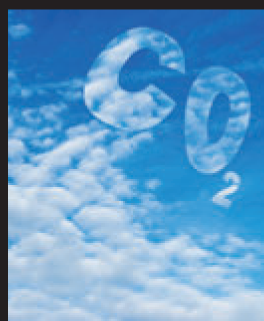

THE AVIATION INDUSTRY LEADERS REPORT 2022

For the fifth year running, *Airline Economics* and KPMG have gained insights into the commercial aviation industry through a series of in-depth interviews with major aviation leaders that delve into the real challenges facing the sector. This report distils the main issues and perspectives shared by industry leaders in one insightful annual publication during one of the most difficult periods for the aviation industry.

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THANK YOU TO ALL OF THOSE EXECUTIVES WHO GAVE THEIR TIME TO ASSIST WITH THIS REPORT

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RECOVERY THROUGH RESILIENCE

We are delighted to present you with our Aviation Industry Leaders Report 2022: Recovery through Resilience. The report captures the views of industry leaders across the leasing, airline and banking markets and includes input from rating agencies and analysts covering the sector.

Our report last year looked at the devastation that COVID-19 had wreaked on the aviation sector, as it dealt with the largest exogenous shock the industry has ever faced, resulting in a collapse in global air travel.

The hope at this time last year was that the expected global vaccine rollout would help drive a sharp recovery and that the stickiness of investors to the aviation sector would remain strong. A lot of these hopes have come to pass, but challenges still abound.

AIRLINE PERFORMANCE AND AIR TRAFFIC RECOVERY

From a financial perspective, 2021 will bring global airline losses of $51bn. While a significant improvement on the $137bn loss in 2020, it will still represent the second highest loss on record.

Widescale airline failures however have, for the most part, continued to be prevented by the huge levels of government support provided and which now exceeds $240bn since the onset of the crisis. While there are those that question how long these supports can continue, the strategic importance of air travel, both from a commercial and social perspective, is what has driven this remarkable level of support. While the pandemic's impact may persist, this fundamental fact remains.

The recovery in air travel has been material but it has also been geographically disparate. Global passenger numbers grew by almost 30% to 2.3 billion in 2021, however this remains just over half of 2019's 4.5 billion air travellers. IATA's current expectation is that it will be 2024 before the figures return to 2019 levels.

This recovery has been primarily driven by large domestic markets (including the US, China, Russia, Brazil) and, in the latter half of the year, a recovery in the European market, as the benefits of the EU vaccine passport and the reopening of transatlantic travel could be seen. The Asia Pacific market continues to be the area causing most concern, where stringent travel restrictions have resulted in traffic levels remaining up to 70% below 2019 levels.

What is evident over the course of 2021 is that once restrictions lift, people are keen to return to the skies. Variants of concern, such as Delta and Omicron, have posed challenges to the recovery. However, the clear levels of pent-up demand, and the general bounce back of the global economy, drive optimism that the recovery will continue apace. A more globally co-ordinated approach both to vaccine roll-out and health travel passports is essential in driving the quickest possible recovery.

A more nuanced and considered approach to new variants would also be advisable. As noted by the World Health Organisation, travel bans are not effective in controlling the spread of the virus. IATA is correct when it states that any restrictive measures should be properly coordinated and risk assessed, and where deemed necessary, should be time-bound and regularly reviewed.

For the airline sector, market disruption will continue to provide new opportunity. Dozens of new start-ups have emerged, seeking to benefit from the recovery, without the financial scars of their more established competitors. Time will tell in relation to their relative success.

Talking about oil price and interest rate volatility seems almost quaint given the challenges of COVID-19, but these key metrics will return to prominence as airlines continue to ramp up activities in line with the recovery. Coupled with rising labour costs and ongoing supply chain issues, ramping up activity will not be without challenges.

Like previous downturns, there will be winners and losers. One expects that those focused on low-cost and short-haul travel will be best placed to prosper in the near term. As always, in order to excel, operational excellence is a must for airlines.

THE GROWING INFLUENCE OF AIRCRAFT LESSORS

The pandemic has been extremely challenging for aircraft lessors, but the crisis has highlighted the resilience of the leasing business model. Large-scale, well-run lessors, have expertly managed their own liquidity challenges and have been essential partners in supporting their airline customers through the crisis. This support throughout the past two years has deepened and strengthen relationships between lessors and airlines.

Airline balance sheets have been decimated by the pandemic and most airlines will be severely capital constrained for the foreseeable future. As a result, lessors have taken on a greater importance in funding new deliveries.

The long-posed question of whether the percentage of leased aircraft can break 50% has been answered; the question now is how high that percentage could climb. Either through their own order books or via the sale-and-leaseback channel, close to 60% of new deliveries were funded by lessors in 2021. The prevailing, though not universal, view coming from the industry leaders we spoke with was that this is a level that could be sustained over the longer term.

Previous downturns have driven lessor consolidation and it was not a surprise to see material M&A activity in 2021. However, the remarkable AerCap acquisition of GECAS, bringing together the two largest players in the market and creating a super-sized leasing group, came as a shock to most. The fallout from that transaction will be interesting to observe, both in terms of what wider market activity it may drive and in relation to the questions it raises around the importance of scale.

While there was consensus that more lessor consolidation is likely, it is also acknowledged that ready sellers of large portfolios are not immediately obvious. There is also an expectation that we will continue to see new entrants and indeed we already have seen some emerge since the outset of the crisis, mostly backed by US private equity. The challenge for those new entrants will be how they compete with established larger players, who may be able to access cheaper funds. These new entrants appreciate this challenge and will be looking for innovative ways to drive returns.

The consolidation that occurred in 2021 has also resulted in some high-quality ambitious individuals seeking new opportunities. Given those that join the leasing world rarely tend to leave, we will be watching how this plays out in 2022 with interest, particularly given the continued flow of capital into the space.

FINANCING

There is no greater evidence of the attractiveness of aircraft leasing than the $21bn in unsecured funding in the capital markets that AerCap were able to raise in completing the GECAS transaction, a debt raise that was more than three times over-subscribed.

AerCap was not alone in accessing the unsecured bond markets and at very attractive rates. Investment grade lessors including Air Lease Corporation, Aircastle, Aviation Capital Group, Avolon, BOC Aviation, DAE Capital and SMBC Aviation Capital, all had successful unsecured bond raises during 2021, with over $32bn being raised by lessors during 2021.

The quantum raised and the interest rate spreads achieved by each of these investment grade lessors highlight both the confidence the investment community has in the leasing model and also speak to the maturity of aviation as an investible asset class. Even as we move towards a rising interest rate environment, there is a widely-held belief in the lessor community that there will be a continued ability to obtain attractive spreads on unsecured debt for large-scale, well-run leasing platforms.

The traditional aviation banking market, which retrenched as the crisis took hold in 2020, made a cautious return in 2021. We also saw the emergence of a number of new non-traditional lending platforms, as investors sought to play in multiple parts of the capital stack. It will be interesting to watch how this trend develops.

The aviation asset-backed securitisation (ABS) market, which had become a key pillar of aviation finance funding $10bn of aircraft purchases in 2019, effectively shuttered in March 2020. Its return in 2021 was much hoped for but few foresaw how strong the market would come roaring back. Its prompt return is a welcome success story.

Structural improvements relating to debt service coverage ratios and a greater focus on quality portfolios, resulted in fourteen transactions with a total value in excess of $8.5bn being executed in 2021, second only to 2019 in terms of scale. While most of these transactions were debt-focused deals and we have not yet returned to the pre-COVID tradeable E-Note structures, there is a belief that equity investors will return to the product in a material way in 2022.

CLIMATE CHANGE

The threat posed by climate change continues to loom large over aviation and all stakeholders within the sector acknowledge and appreciate the need for immediate action. 'Flight shame', the imposition of environmental related taxes and regulations, and the increased Environment, Social and Governance (ESG) focus of investors are real concerns for the industry.

While aviation contributes around 2.5% of global CO2 emissions (a significant amount less than what the public generally perceives), its path to reducing its carbon footprint is less obvious than some other sectors.

The 2050 net zero target is hugely ambitious and will be a challenge for the sector to achieve. The building blocks to reducing emissions include fleet renewal, improvements in operational efficiency, technological innovation, sustainable aviation fuels (SAF) and, in the near term, carbon offsetting. Some of these potential technological factors, such as hydrogen or electric-powered aircraft, are a long way from making any material impact.

There is clear consensus that the immediate focus should be on sustainable aviation fuel (SAF), with IATA forecasting that it will be the primary driver of emission reductions over the next decade and beyond. However, there are key challenges relating to the current levels of SAF supply and its current price, which is more than three times that of jet fuel. Incentives are needed to attract more producers and investors to the space and governments need to play an active role in accelerating the demand for SAF.

FLEET FOCUS

For the reasons outlined above and given the nature of the recovery to date, both airline and investor focus continues to be on narrowbody, new technology aircraft. Demand for the A320neo family and the successfully returned 737 MAX remains high and this is being reflected in prices and lease rates. Unsurprisingly, the widebody market remains challenging and will continue to be until the recovery becomes less geographically fractured.

Coming off historic lows in 2020, both Boeing and Airbus are seeking to increase production rates in line with the expected recovery. However, both manufactures need to do this in a staged manner, as they grapple with global supply chain issues. Ramping up is a lot more challenging than ramping down.

One significant positive during this crisis has been the performance of cargo and there is a relatively widely held belief that the pandemic driven surge in e-commerce has given rise to a sustainable step change for the cargo market. Long subject to a reasonable degree of volatility, this potential step change is attracting both new investors and lessors to the space.

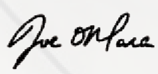
IN CLOSING

Overall, the industry outlook is cautiously optimistic. The last two years have been the most challenging time that aviation has ever faced, but the resilience of the entire sector has been remarkable.

The widely-held belief is that the worst of this crisis is behind us, and that a globalised vaccine rollout, coupled with a coordinated international effort in managing restrictions, will drive a recovery towards 2019 air travel levels.

Over the course of 2021, we have seen that the appetite of the human race to take to the skies is undiminished. The question is when, not if, a full recovery will take place.

I would like to thank all those who gave their time and insights, and I hope you enjoy the read.



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Chapter I

Airlines: Getting Back to Business

Almost two years on from the beginning of the COVID-19 pandemic, the world seems to be gaining traction in the battle against the virus. Vaccination rates are impressive and growing, although perhaps too slowly in some jurisdictions to counter the impact of different variants that are spreading around the world, forcing governments to introduce more countermeasures and once again restricting travel. The latest Omicron variant – initially scaring countries into reinstating many restrictions on travel including mandatory quarantine, testing and vaccination certificates – although more easily spread, is beginning to look milder than previous strains, which could signal the beginning of the end for the coronavirus pandemic.

The human cost of the COVID-19 pandemic has been significant. Globally, as of January 7, 2022, there have been almost 300 million confirmed cases of COVID-19, including 5.47 million deaths. The good news in the fight against the disease is that globally more than 9.1bn vaccine doses have been administered globally as of January 5. The latest data shows that almost half of the world is fully vaccinated (defined as having received two doses of a WHO-approved COVID-19 vaccination) and that many countries are well on the way to an 80-90% fully vaccinated population.

The global economic impact of the pandemic been substantial but not as deep as first feared. In fact, most global economic activity has returned, or is close to, pre-pandemic levels in many countries around the world, with some even performing above pre-pandemic levels. The prompt and extensive financial support for companies and individuals, as well as the rapid development and rollout of vaccines, has protected the world from falling into a deep global recession. Economic growth (measured in GDP) from the middle of 2020 exceeded all expectations (see Chart 4; the black line tracks world GDP). The recovery is well under way, strong headwinds remain. Growth and vaccination rates vary between jurisdictions and the world remains fearful of the impact of the next variant of concern. As Ursula von der Leyen, President of the European Commission, noted: "A global pandemic requires a world effort to end it – none of us will be safe until everyone is safe." Even in areas of growth, the spectre of inflation and rising interest rates has added to the delayed impact on employment levels due to the cessation of government payroll support schemes, which may yet derail the gains made thus far.

The aviation industry has proven its resilience throughout the pandemic, and its recovery is also progressing, even if intermittently. Air travel is among the first sectors impacted whenever variants of concern emerge and governments react to protect their citizens and halt the spread of the disease. As lockdowns were slowly lifted in Spring 2021, airlines began to prepare for an influx of summer bookings, only to be thwarted by the Delta variant again causing travel to be curtailed. Reports of summer holiday makers being stranded abroad as countries updated red travel lists and imposed quarantine restrictions at short notice eventually deterred people from travelling. Indeed, US borders remained closed to most foreign travellers until as late as November. As the end of the year approached, airlines were once again looking forward to capitalising on festive holiday bookings as travellers signed up for summer sunshine breaks, ski vacations and trips to visit family, only to be deterred again by the Omicron variant that emerged from South Africa and spread throughout the UK and into Europe, leaving border closures in its wake. UK travellers were banned from travelling to France and the Netherlands entered total lockdown on December 18, with restrictions only eased on January 15, after the festive period. In China, an outbreak in Xi'an resulted in the total lockdown of the city from December 23, which remains in place in line with China's dedication to its dynamic zero-COVID strategy especially ahead of the Beijing Winter Olympics.

While worry over variants of concern is understandable, the logic and effectiveness of travel bans is open to question. Even the World Health Organisation (WHO) has stated that travel bans are not effective in controlling the spread of the virus. The WHO noted in the aftermath of the various Omicron related restrictions that: "Blanket travel bans will not prevent the international spread, and they place a heavy burden on lives and livelihoods. In addition, they can adversely impact global health efforts during a pandemic by disincentivizing countries to report and share epidemiological and sequencing data. All countries should ensure that the measures are regularly reviewed and updated when new evidence becomes available on the epidemiological and clinical characteristics of Omicron or any other variants of concern."

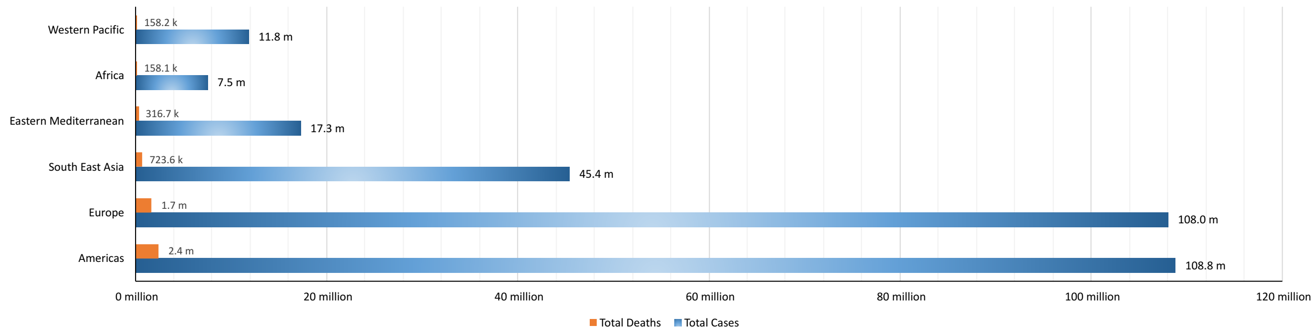
In relation to these WHO comments and the general reaction to Omicron, Willie Walsh, the Director General of IATA, reasoned that "the goal is to move away from the uncoordinated, evidence

"To have a robust economy, you need a robust airline industry, The airline industry is so important to the world. Air freight is the only reason we've been able to distribute about 10 billion vaccinations, and because passenger airlines rapidly turned to cargo to move PPE around the world."

Helane Becker,
Cowen & Company

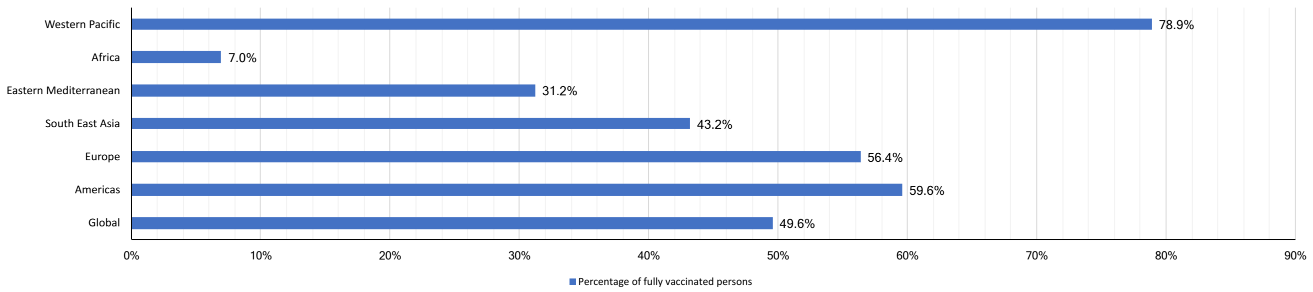
COVID-19 Impact

The charts below show the total numbers of cases and deaths from COVID-19 and the vaccination rates in regions and jurisdictions around the world, based on data from the World Health Organization as of January 5, 2022.



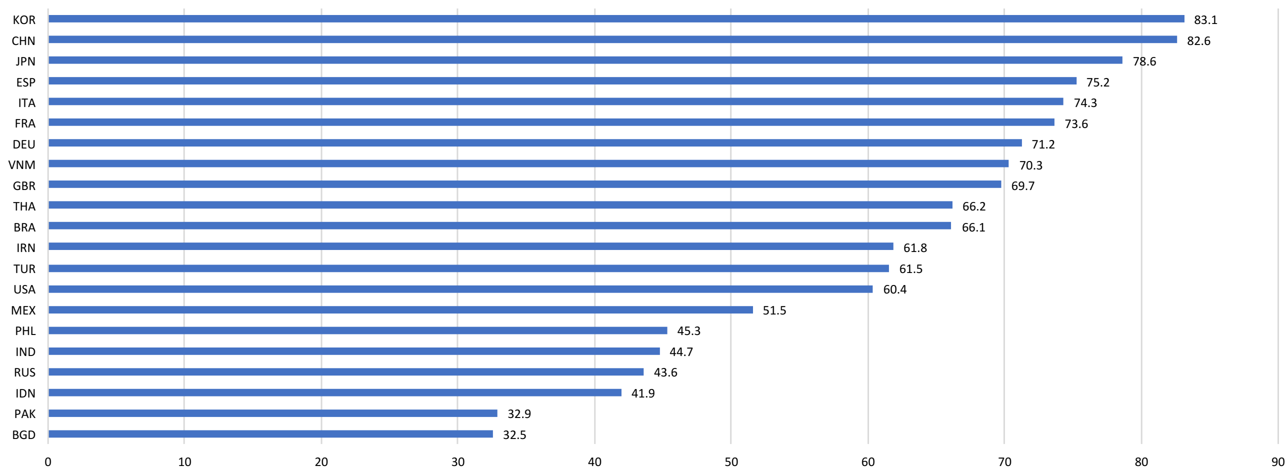
Source: World Health Organization

CHART 1: TOTAL CASES AND DEATHS FROM COVID-19



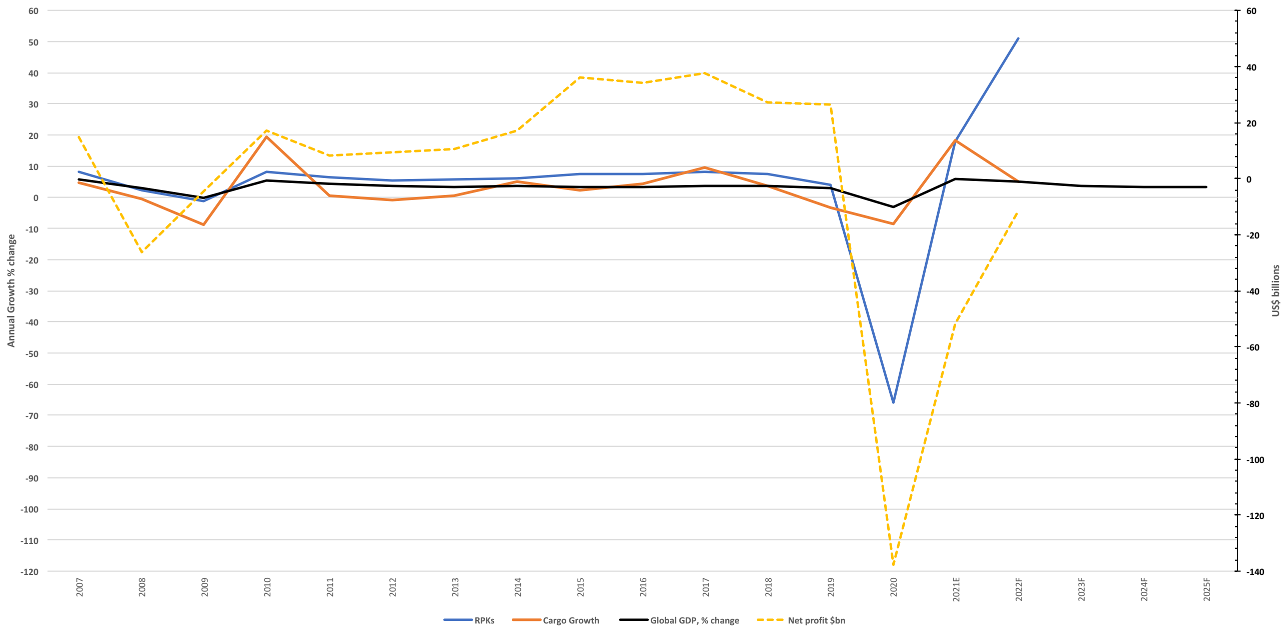
Source: World Health Organization

CHART 2: REGIONAL FULLY VACCINATED PERSONS



Source: World Health Organization

CHART 3: COUNTRIES WITH THE HIGHEST FULLY VACCINATED PERSONS



Source: IMF, IATA, World Bank

CHART 4: WORLD ECONOMIC GROWTH, AIR TRAFFIC AND AIRLINE PROFITABILITY GROWTH

absent, risk-unassessed mess that travellers face. As governments agreed at ICAO and in line with the WHO advice, all measures should be time-bound and regularly reviewed. It is unacceptable that rushed decisions have created fear and uncertainty among travellers just as many are about to embark on year-end visits to family or hard-earned vacations."

At the beginning of 2021, the world hunkered down for a slow winter while it waited for vaccination rates to increase. By the summer, there was a clear acceleration in air travel demand.

"The summer was quite strong in terms of domestic and regional travel, especially in the domestic US market, US into Europe and some other key markets, but it was a turbulent year due to the uncertainty caused by government restrictions and travel rules around international movement," says Helane Becker, managing director, Cowen & Company. "As international restrictions were removed, we saw a significant amount of pent-up demand but at the close of 2021 new variants again caused volatility, which will continue into early 2022. The industry will recover to maybe half of where it was, mostly driven by domestic recovery while international traffic is still down by close to two thirds."

The volatile operating environment has been a rollercoaster of a ride for

CHART 5: AIRLINES THAT CEASED OPERATIONS IN 2021

Airline	Country
Air Namibia	Namibia
Sky Regional Airlines	Canada
Mango Airlines	South Africa
Interjet	Mexico
Ethiopian Mozambique Airlines	Mozambique
Air Iceland Connect	Iceland
Amaszonas	Uruguay
Stobart Air	Ireland
Air Antwerp	Belgium
Atlantis European Airways	Armenia
Fly My Sky	New Zealand
Orange2Fly	Greece
Great Dane Airlines	Denmark
Alitalia	Italy
Blue Panorama	Italy
ITA	Brazil

CHART 6: AIRLINES THAT ENTERED BANKRUPTCY PROTECTION OR RESTRUCTURING IN 2021

Airline	Country
Philippines Airlines (PAL)	Philippines
HNA (parent of Hainan Airlines)	China
Garuda Indonesia (restructuring)	Indonesia
AirAsia X (restructuring)	Malaysia

CHART 7: LEASING COMPANIES THAT ENTERED BANKRUPTCY OR RESTRUCTURING IN 2021

Airline	Country
AeroCentury	US
Nordic Aviation Capital	Denmark

beleaguered those airlines. However, after two years, airlines that have survived have proven their adaptability.

At the onset of the pandemic crisis in early 2020 and throughout the subsequent year, the expectation was that the aviation industry would suffer tremendously from the sudden and widespread restrictions on global air travel - and understandably so. IATA initially predicted aviation industry losses to peak above $118bn in 2020; however they actually ended up exceeding $137bn, devastating the industry. Airlines bore the brunt of the pain as passenger demand (measured in revenue per passenger kilometres (RPKs)) tumbled below 40% of 2019 levels. The forecast for 2021 is for losses of $51bn, a significant improvement but still the second worst financial performance ever recorded.

Net losses are expected to reduce to $11.6bn in 2022 but they are not expected to turn positive until end of 2023 or even into 2024 depending on how different world governments handle the virus as it enters an endemic phase. IATA expects total passengers numbers to reach 3.4bn in 2023, up from 2.3bn in 2021 but still a long way from 2019 levels of 3.4bn air travellers.

The figures (see Chart 4) clearly show that the industry is past the depths of the crisis and entering 2022 – almost two full years after the beginning of global restrictions – aviation has proven its resilience and is on the road to recovery. A rocky road for sure with variants of concern curtailing gains made after lockdowns were lifted but nonetheless a solid start to the recovery.

The resilience of many over this period has been astounding given the pandemic's impact on air travel. Going into the crisis, airlines were continually downgraded and expectations of large scale bankruptcies and deep liquidity issues were widespread. Although there have been some bankruptcies and many restructurings, the overall impact on airlines has been curtailed somewhat by the overwhelming support of national governments, banks, capital markets and private investors, and most importantly by the leasing sector.

Reflecting on the past 24 months, Betsy Snyder, senior analyst at S&P Global Ratings notes that at the beginning of 2020, the rating agency expected a severe negative impact on the airline sector. "In the spring of 2020 when COVID-19 first hit, we took several downward rating actions on the airlines because we expected a greater impact on their cashflow, cash generation and liquidity than on the aircraft lessors. The airlines successfully raised a great deal of liquidity during the pandemic using many assets as collateral for secured financings – even coming up with new forms of collateral such as the frequent flyer programs. In the US and elsewhere, airlines were also provided substantial government aid through payroll support programs and funding in terms of loans and equity infusions, which aided their liquidity."

Government support has been critical to the survival of many airlines. Even those airline companies that have not received state-backed loans, many have been assisted by varying government payroll support schemes. The strength of the capital markets has been a major lifeline for airlines – especially those without access to government support. Another surprising factor over the past two years has been the sustained flow of capital supporting the industry, which has been undeterred by the restrictions placed on air travel in the search for yield. But many airlines may not have been able to survive at all without the extensive support provided by the leasing sector.

Leasing companies have demonstrated throughout this crisis period that they are not to be judged by the same credit metrics as airlines. Although all lessors have had some exposure to defaulting airlines and because of the global nature of the crisis have been restricted in their ability to repossess and re-lease aircraft to new clients owing to the global nature of the crisis, they have succeeded in negotiating inventive ways to preserve cashflow and raise unprecedented amounts of liquidity from various sources including banks, new alternative lenders, the capital markets and the private sector.

"It was both surprising and positive that both airlines and aircraft leasing companies were able to go to the capital markets and raise large amounts of both secured and unsecured debt," says Marjan Riggi, senior managing director and Global Head of Transportation and Commercial Finance at Kroll Bond Rating Agency (KBRA). "It defied logic somewhat given the context, the capital markets and investors clearly thought very positively about the aviation market over the long term, even at a time when much of the world fleet was on the ground. That speaks to the fact that investors think more long term and that the fundamentals of air travel still remain very strong nearly two years into this crisis."

The aviation industry has been buoyed enormously by the flood of private, non-bank capital into the space, setting up new leasing platforms and start-up airlines, which has more than offset the withdrawal of certain banks and investors.

"The traditional commercial aviation banks, which were always part of the spectrum of lenders in this industry, historically have taken a long time to come back for a number of reasons, and that space has largely been taken by the alternative lenders," says Patrick den Elzen, CEO and founding partner of Arena Aviation Capital. "But the banks are returning slowly. Some Japanese and Korean banks are active again. French banks have never been completely inactive, but they've been very slow to proactively source new business. Aviation banks are coming back, which is a positive development because commercial banks tend to be a bit cheaper than alternative lenders, even though they tend to be more conservative. The alternative debt providers have clearly taken a big piece of the market and there is no reason why that will change."

As well as enhanced financial support, airlines have also mastered cost cutting, with many becoming far more streamlined and efficient businesses. "In some ways COVID-19 has helped airlines to become much more focused on cost cutting, and almost all of them have reduced their fleets and costs, especially labour and capex costs," observes Riggi.

Airlines today are in a much stronger position to cope with the multiple waves of the pandemic have hit different geographic regions at different times, but the volatile operating environment has made it necessary for airlines to hoard as much cash as as possible in order to ride out these waves of uncertainty until the operating environment stabilises and the recovery is free from disruption.

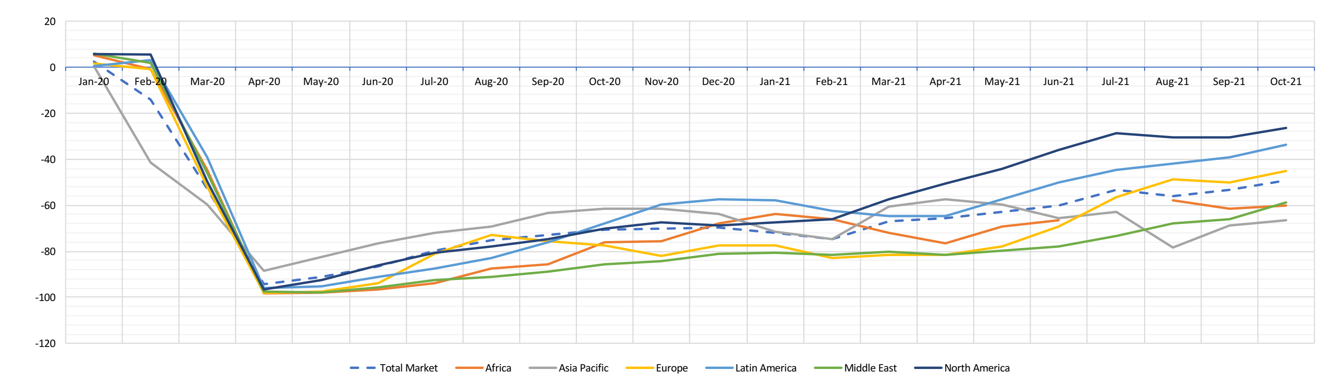
Analysing Air Travel Recovery

The three sectors of the airline industry – cargo, domestic, and international passenger travel – have each displayed very different trajectories throughout the crisis period.

Air cargo continues to show its resilience as it has done throughout the pandemic and although experiencing some softening in demand by the end of 2021 due to global supply chain issues, the market remains a more stable investment than it has been pre-pandemic both in terms of demand and profitability.

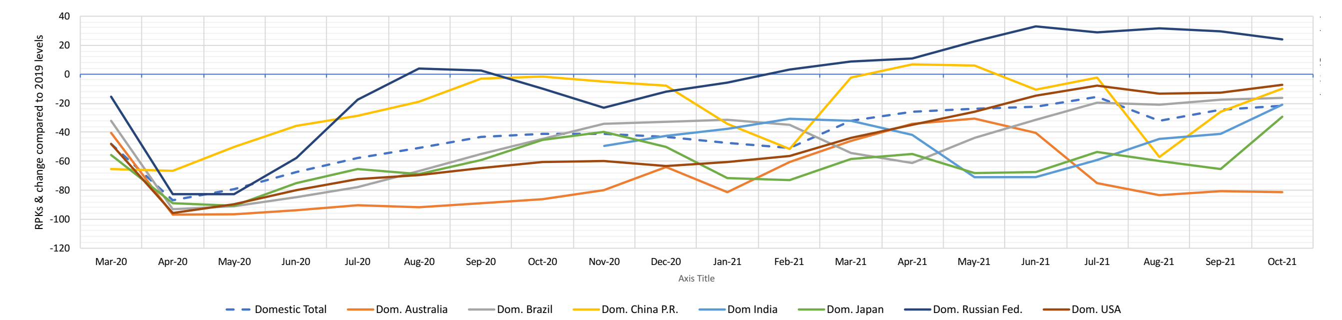
"To have a robust economy, you need a robust airline industry," commented Becker, who gives an impassioned defence of the airline industry as a force for good in the world, demonstrated in recent times by its role in transporting vaccines and personal protective equipment (PPE), and its innate ability to join people and businesses together. "The airline industry is so important to the world," she says. "Air freight is the only reason we've been able to distribute 10 billion vaccinations, and because passenger airlines rapidly turned to cargo to move PPE around the world."

Belly cargo capacity for international passenger aircraft remains at low levels boosting demand for dedicated air freight. The e-commerce phenomenon



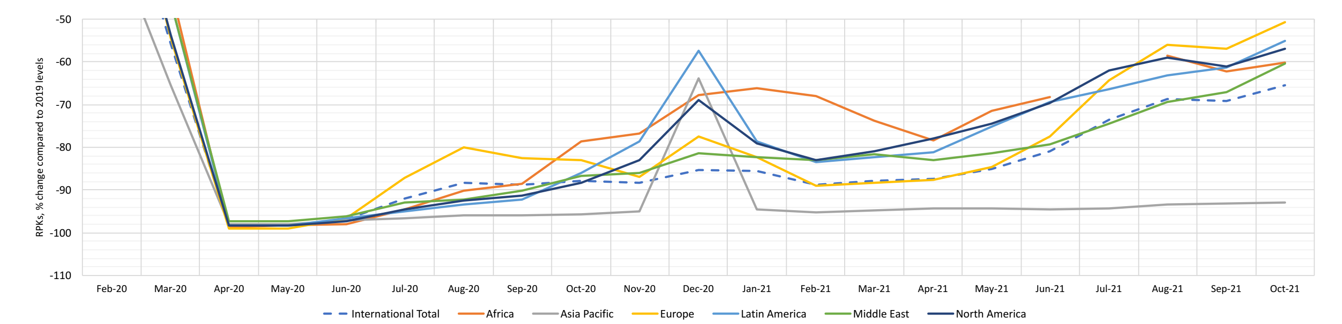
Source: IATA

CHART 8: TOTAL MARKET AIR PASSENGER TRAFFIC GROWTH



Source: IATA

CHART 9: DOMESTIC AIR PASSENGER TRAFFIC GROWTH



Source: IATA

CHART 10: INTERNATIONAL AIR PASSENGER TRAFFIC GROWTH

– already growing rapidly – soared during the pandemic as shops closed. These factors are predicted to continue to feed demand for air cargo in the recovery period and beyond. Likewise, the broad reaction to global supply chain issues and rising labour costs, is forcing many companies to transfer manufacturing from locations in Asia to closer jurisdictions such as Mexico and Canada for US companies, feeding demand for regional air cargo. (More on the Cargo market on page 40).

Domestic passenger markets are in full recovery and for many jurisdictions, levels have returned to within 20% of pre-pandemic figures. Airlines located in regions with strong domestic markets, such as the US, Russia, China and Brazil, have profited from the strong demand for air travel as many international borders remain closed or restrictions and quarantines deter travellers.

"We have seen a strong recovery in much of the world," says Robert Korn, president of Carlyle Aviation Partners. "In regions with large domestic operations, such as in the United States, Brazil, China until very recently, and in Russia, we have seen a great recovery. We're now seeing India start to come back online. Where we see the world struggling is intra-Asia, to and from Europe, and North America into Asia. Those are the areas where the world is looking for a recovery of traffic and reopening of borders and routes."

Short-haul air travel demand is expected to surge strongly in 2022 as there is ample evidence of that oft-quoted pent-up demand whenever restrictions are eased. Long haul travel, however, is not expected to recover to meaningful levels until at least 2023.

"Throughout 2021, there was a steady improvement in the performance of the airline industry," observes Aengus Kelly, chief executive officer of AerCap. "The lack of requests for deferral agreements and the demand for additional aircraft began in the fourth quarter of 2020. We saw there was a fair bit of optimism in the United States and in Europe regarding the summer of 2021 and indeed the summer of 2022. That optimism proved to be well founded until the end of this year, when we had the onset of the Omicron variant, which has paused the progress, but hasn't knocked it backwards. I feel very confident about the outlook for 2022 as a whole. We will see a return to 2019 traffic levels in many parts of the world as we go through the summer of 2022, which will be focused on the shorter haul networks. The long haul market will follow, but not in 2022. There has been a steady improvement. Airlines are extraordinarily adaptable companies, which they have proven over many cycles."

The recovery of international travel remains muted as borders closed at the end of 2021 in reaction to new variants. The latest figures from London Heathrow airport show that at least 600,000 passengers cancelled their trips in December due to the Omicron variant. The erratic changes to travel rules in 2021 caused the main UK airport to serve fewer passengers in 2021 than in the first year of the pandemic. The real stumbling block to the significant return of international travel is the effective continuing lockdown of countries in Asia, many of which have been adhering to zero-COVID policies with varying degrees of success. Although lockdowns have been lifted in Australia and New Zealand, these countries continue to have strict entry restrictions in place for vaccinated travellers. China and Hong Kong follow a similar zero-COVID strategy and are deterring most foreign visitors with a mandatory 21 day quarantine, even for fully vaccinated travellers.

The difficulties facing airlines in South East Asia have been well documented. Philippine Airlines filed for bankruptcy protection towards the end of 2021, while AirAsia X and Garuda Indonesia are also undergoing difficult restructurings as they struggle to survive while international air travel remains limited.

"There's evidence of recovery in many markets. Unfortunately, some segments of the market remain in a very challenged position, particularly South East Asia where generally the government response and indeed individual airline responses have been less surefooted than some other markets," says Peter Barrett, chief executive of SMBC Aviation Capital. "But even in those regions we are beginning to see some sense of these restructurings and the rebuilding of airlines is taking shape, but it's going to take time. 2022 will be another year of recovery for airlines; it will be well into 2023 and 2024, before the market returns to pre-pandemic levels of travel."

One aviation banker expects to see more airline failures in South East Asia, mainly due to the lack of government support for flag carriers to avoid defaults. In 2020, the refusal of the Thai government to support Thai Airways shocked the market but that general lack of state support in the region has now become more widespread as international air travel remains restricted and countries continue to generate less revenue from international tourism.

There are clear signs that airlines in regions where air travel is recovering, are no longer just surviving but improving and planning for the future. "We have seen airlines now starting to plan for the future," says Thomas Baker, chief executive of Aviation Capital Group (ACG). "We've seen survivors looking at their capacity and start to plan ahead for what they expect to be a very strong recovery. Airlines are also starting to migrate to new technology aircraft, or they have new technology aircraft delivering in the medium term and are extending current aircraft to bridge any capacity gaps. So we are seeing airlines starting to plan around the future again; and that future requires more capacity."

COVID-19 is here to stay and as such the world and airlines will have to adapt in permanent ways to manage the health risk while driving economic growth. For the airline industry, this may mean permanent vaccination passports for air travellers, mandatory testing requirements, and wearing masks on board.

"We will likely see other variants emerge over the course of the next two or three years," says John Plueger, CEO of Air Lease Corporation (ALC). "But I still broadly see an overall recovery going forward. We will move as an industry towards an international vaccine passport and, although annoying, taking a COVID test before an international trip will become just a part of normal international travel, just like going through security, which didn't exist until 20 years ago. This is just a by-product of the world that we live in."

The debate over whether business travel will see the same resurgence as leisure travel once restrictions are completely removed has diminished somewhat as evidence shows that when people have the opportunity to travel for whatever reason, they tend to do so in large numbers. There is also the suggestion that leisure travellers that have taken the opportunity to fly in business class during the pandemic as fares reduced will be willing to pay more for their more luxurious seat and service for leisure trips. And the reverse trend is also true, lower business travel budgets may push business class passengers into economy. Airlines and lessors are both optimistic for all cabins to return to profit as air travel demand continues to ramp up.

"I've always thought it was more important for airlines to make their money on leisure travel and view business as gravy rather than rely on it to make their money," says Becker. "Business travellers should use the same airline they use for business travel for leisure travel with their families. The problem is that this model has been twisted by the astronomical difference between business and economy fares. But a far as business travel goes we see that it is about 60% recovered but there is a lot of pent-up demand so it will certainly recover to at least 85% or 90% of pre-pandemic levels."

"The rebuilding of airlines is taking shape, but it's going to take time. 2022 will be another year of recovery for airlines; it will be well into 2023 and 2024, before the market returns to pre-pandemic levels of travel."

Peter Barrett,
SMBC Aviation Capital

Headwinds to recovery

There are other more potentially damaging headwinds that airlines will need to tackle on the road to recovery. Rising costs are a major challenge. The price of oil has been slowly ticking upwards as supplies remain constrained, maintenance costs will rise as slots are tied up with aircraft grounded for two years, while labour shortages are leading to wage inflation. Rising interest rates will only add to the already significant debt burden facing airlines, which is considerable. Airlines have raised record numbers of debt since the beginning of the pandemic period in early 2020. Bloomberg figures show global airlines raised as much as $250bn in 2020 and more than $340bn in 2021.

Lessor counterparties are very aware of the heightened credit risk of their airline counterparties and are applying careful metrics when taking on new customers.

"Clearly, there has been significant distress for airlines during this crisis," observes David Butler, CEO of Seraph Aviation Group. "At this point, more than 60 airlines have effectively gone through a bankruptcy or a restructuring process through the course of the pandemic.

"A recent study of the 2021 financials of the Top 100 airlines showed that balance sheet debt (including operating lease liabilities under IFRS 16) increased from $392 billion to $596 billion and the debt/equity ratio more than doubled from 2.3x to 5.4x."

Butler notes that: "A number of airlines are still operating on extremely thin liquidity and poor access to capital: 29 of the 100 airlines in the study had liquidity of less than 5% of normalised revenues," he says. "Further shocks could cause further distress, which ultimately leads to restructuring and bankruptcy."

Airlines are mindful of the need to reduce leverage but they aren't able to do so with any confidence while the operating environment is still being disrupted by the virus, creating the need to conserve large cash reserves.

Speaking on a panel for *Airline Economics* Growth Frontiers Dublin virtual conference on January 17 2021, American Airlines treasurer Megan Montana, said that not only was almost a third of the debt raised by the airline prepayable but it was also efficiently priced at around 4.5%, providing the airline with a lot of flexibility in reducing the debt burden at a time that make sense for the company. "When we think about how to achieve our goal of paying down $15 billion by the end of 2025, we will be focused on paying down the front end of the curve, freeing up high-quality, unencumbered assets and making sure that we do it as efficiently as possible so focusing on paying down that prepayable debt. Today, it's a little frustrating for our treasury team because they've got all these great ideas to reduce our debt but we need to be thoughtful and prudent about when we start that process to make sure that we are through the last wave or newest variant before we start facilitating that debt pay down in earnest."

United Airlines is in a similar situation in that it is holding a lot of liquidity but it is also upguaging its fleet to position the airline for the recovery. "As part of our United Next plan we are upguaging and retiring a number of our regional aircraft to mainline aircraft," says Pam Hendry, vice president and treasurer at United. "The math is just easy. When we fly more seats on a route, we are going to make more money. Certainly increasing ticket prices come with an improving economy. But we remain incredibly focused on cost cutting [and] leverage is a huge issue that we need to be very thoughtful about. In the old days, we used to look at our cash back balance as sort of equal to what our advanced ticket liability was plus a little bit more to deal with short term impacts such as fuel price changes. Now we look at cash as so much more than that. Historically, I would not have looked at net debt as one of my metrics, but today, because we do have so much cash and because so much of it will be used to pay down debt, I do take some of that benefit. I'm not going to prepay debt unless there's a really compelling economic reason to do so."

Airlines – especially those with a strong domestic market – have had to grappling with varying capacity plans to ensure they have the right level to meet demand. Given the nature of the virus, the emergence of new variants and varying travel restrictions, often from state to state, this has been something of a moving target. At the same time, airlines are juggling short-term capacity problems with the longer term expectations as they embark on re-fleeting programmes. Speaking on the same panel discussion, Nat Pieper, senior vice president – fleet, finance and alliances, and treasurer for Alaska Airlines, pointed to the difficulties of calculating capacity when attempting to rightsize the fleet. "This is a major struggle given that the focus is so much on the short term right now due to Omicron," he says, adding that rationalising the fleet has been a major initiative during this downturn, which has allowed the airline to retire older aircraft and bring on more efficient aircraft. He notes: "You can't do big fleet initiatives with a short term focus. You have to believe longer term that we're going get to normal capacity again, and then move forward and execute your fleet rationalization plan which is a multi-year process."

Alaska took the opportunity presented by the pandemic period to phase out all of its Airbus aircraft and move to an all-Boeing fleet: "We took the decision to take advantage of the crisis and the fall in demand to park all kinds of a A320s and A319s, and ultimately not bring them back," says Pieper. "When things ramp back up we want to have the most efficient aircraft possible and that's the Boeing 737 family and really moving back to a single fleet type. The key there is having that long term focus on when to take deliveries."

Alaska is also focused on its own balance and how to balance the need to invest in new aircraft with the increased debt on its books. "We have to balance taking delivery of these new aircraft with the excess cash all of us are carrying, and we'll all have different ways to, to meter that down to a more normal level. I think there will be a lot of rockiness going forward."

Airline Economics
GROWTH FRONTIERS
DUBLIN
9-11 MAY 2022
The RDS, Intercontinental & Clayton Hotels
Ballsbridge, Dublin
supported by:
Fáilte Ireland
National Tourism Development Authority
www.aviationnews-online.com/conferences/dublin-2022/
FOR MORE INFORMATION AND BOOKINGS CONTACT:
PHILIPT@AIRLINEECONOMICS.COM OR CALL +44 (0) 1782 619 888

Airline Finance

After initially opting for government-backed financing in 2020, utilising its loyalty programme and IP as collateral for a treasury loan rather than a privately-placed financing, American Airlines leveraged its AAdavantage loyalty programme to raise $10bn and repaid the government loan.

The American AAdavantage package consisted of a $6.5bn bond offering – $3.5bn 5.50% five-year senior secured notes and $3bn 5.75% eight-year senior secured notes – as well as a new $3.5bn seven-year term loan B facility led by Barclays. The package was upsized by $2.5 billion from the anticipated original $7.5bn transaction size, at a blended average annual coupon rate of 5.575%.

Joint lead bookrunners for the notes were Goldman Sachs, Barclays and Citigroup. Joint bookrunners were BofA Securities, Credit Suisse, Deutsche Bank, ICBC Standard Bank, JPMorgan, Morgan Stanley, SMBC, BNP Paribas, Credit Agricole, HSBC, MUFG, Standard Chartered, US Bancorp and BOK Financial Securities. Goldman Sachs acted as the sole structuring agent for the deal.

The offering was substantially oversubscribed, attracting more than $45bn worth of orders. The timing of the offering coincided with a new US Treasury stimulus bill and tapped into investor demand for yield as interest rates remain low.

American used the proceeds to repay the $550m drawn amount outstanding under its term loan facility with the US Department of the Treasury that was secured by the AAdvantage program collateral and terminated the loan agreement.

Although American has already paid off its government debt, European and other airlines are still working through government-backed loans but are prioritising their repayment. Lufthansa announced in November 2021 that it had repaid or cancelled all remaining government stabilization funds (ESF) – some €1bn – loaned from the Federal Republic of Germany much earlier than planned thanks to its “fast restructuring” and “the capital markets confidence in the company”. ESF has committed to sell its stake in the airline by October 2023 at the latest. After a successful comeback issuance in November 2020, which raised €600m by way of a convertible bond and a €1bn corporate bond, last year Lufthansa raised €6.3bn in the capital markets – a €1.6bn bond in February and again in July, and a capital increase in October that generated €2.2bn, boosted by another €1.5bn bond in November.

Also in November, Air Canada announced its exit from government financial support, withdrawing from the C$3.975bn financing facility, which was undrawn since the airline successfully raised C$7.1bn through the issuances of C$2bn 4.625% eight-year senior secured notes, US$1.2bn 3.875% five-year senior secured notes, as well as a US$2.3bn term loan B due 2028 and a US$600m revolving credit facility due 2025.

Investment grade airlines have continued to tap into the bond market. In the first quarter of 2021, easyJet raised £1.2bn under its Euro Medium Term Note (EMTN) seven-year senior bond issuance with a 1.875% coupon. The bond was five times oversubscribed and competitively priced for the time. Capitalising on the success of its rival and on the back of improved financial results, Ryanair also went to the bond markets in May 2021, raising €1.2bn through the issuance of a five-year senior unsecured bond that priced at a record low coupon of 0.875%. Pricing tightened significantly from initial price talk set around mid-swaps +150bps on the back of soaring demand. The four-fold oversubscription with high quality accounts and several triple-digit orders, enabled the pricing to be reduced significantly without losing orders.

Later in the year, easyJet also launched a rights issuance and at the same time confirmed to the market that it had rebuffed an unsolicited preliminary takeover approach from rival Wizz Air, which it described at the time as a "low premium and highly conditional all-share transaction" that was "carefully evaluated and then unanimously rejected". Shaking off the takeover approach, easyJet succeeded in raising £1.2bn in a fully underwritten rights issue, alongside signing commitments for a new four-year senior secured revolving credit facility of $400m, which had a two-year extension option that was conditional on the success of the rights issue.

The aborted takeover attempt drew the attention of arch rival Ryanair chief Michael O'Leary, who commented at the time that he believed rivals Wizz Air and easyJet would need to merge or risk being taken over by the larger flag carriers, which he expects to buy smaller rivals as the industry moves towards consolidation.

"Both easyJet and Wizz will either need to be taken out or…coalesce together," O'Leary said. "Consolidation needs to happen and will happen. It's an inevitability, particularly coming out of COVID."

Although the leasing sector has seen more consolidation in 2021 and into 2022, airline consolidation has not made headlines over the past year, save for IAG cancelling its acquisition of Air Europa due to regulatory issues. One aviation banker doubts that there will be any M&A activity in the airline market "so long as the COVID-19 crisis is bringing too many uncertainties on air traffic".

Wizz Air has performed strongly throughout the crisis and even launched a new airline Wizz Air Abu Dhabi in 2021. The airline continues to go from strength to strength and its most recent bond issuance demonstrates its resonance with investors.

The latest issuance from Wizz Air – rated BBB- by Fitch and Baa3 by Moody's – a €500m offering of notes due 2026 executed within its Euro Medium Term Note Programme, priced at just 1.00% on January 19, 2021. Wizz Air intends to use the proceeds to pay down its government debt first, repaying the £300m CCFF facility in February 2022. The offering, arranged by joint bookrunners, Barclays, BNP Paribas, Citigroup and JPMorgan, was multiple times oversubscribed.

In January 2021, Wizz Air had successfully re-opened the corporate primary markets with its inaugural issuance of €500m 1.350% three-year bond. That offering was also substantially oversubscribed, attracting an orderbook of almost €2bn, which allowed the airline to price at a yield of 1.350% (achieving 40bps tightening from IPTs). This was the first ever benchmark offering from a CEE airline issuer.

In Asia, airlines also continued to tap into the bond markets with both Singapore Airlines (SIA) and Cathay Pacific issuing US dollar bonds for the first time. In January 2021, SIA successfully raised US$500m via its first US dollar-denominated bond issuance. The issuance was oversubscribed with the final demand at more than US$2.85bn. The five-year bonds priced with an annual coupon of 3.0%.

Singapore Airlines raised approximately S$13.3bn in additional liquidity in its fiscal year 2020-2021, including S$8.8bn from a rights issue, S$2bn from secured financing, S$850m via a convertible bond issue, another S$500m via a private placement of new 10-year bonds, and more than S$500m through new committed lines of credit and a short-term unsecured loan. Heading into 2022, the airline is reported to be preparing to issue a new US dollar bond with the goal of raising between US$500m to US$750m.

The sheer scale of funding raised by airlines in the pandemic period continues to be significant – with too many issuances to mention within the confines of this report. Much of the emergency funding raised in 2020 has been refinanced at lower rates in 2021 with more manageable tenors. But the debt burden remains significant and should interest rates rise – as they are widely predicted to do – that burden could increase even further as air travel demand and revenue remain depressed.

"We've spent a lot of our time exploring opportunities with start-ups or very low-cost or ultra-low-cost carriers. We think those business models really make sense going forward. They are disruptive to incumbents and there is certainly demand for those airlines as leisure travellers want to get to their destination in as cost effective way as possible. We have spent a lot of time trying to support carriers that fit that profile throughout the pandemic, which we will continue to do."

Ryan McKenna,
Griffin Global Asset Management

Labour issues

A more immediate issue is the increase in work absences due to COVID-19 related illness and isolation requirements. Most airlines are also currently suffering from acute labour shortages, as demonstrated by the cancellations of hundreds flights by US carriers over the festive holiday period.

Data from Cirium shows that between December 24, 2021 and January 3, 2022, some 59,240 flights were cancelled as airlines struggled with operational challenges around the Omicron surge and winter weather. This resulted in the most December cancellations for the past decade – six times higher than in 2019 and two and half times more than 2020. In total, 20,500 flights were cancelled in the first three days of the new year alone. Flight cancellations by the big four US airlines – American Airlines, Delta Air Lines, Southwest Airlines and United Airlines – soared to 7,040 over this period.

The payroll support programs initially helped airline keep staff on the payroll but airlines still reduced their headcounts significantly. As demand returns, airlines are attempting to hire at scale but COVID-related illness and self-isolation rules are a constant challenge for airlines and all companies as the current variant continues to spread rapidly. Many airlines have announced reductions to their January schedules by 10-20% in some cases and are operating a more flexible schedule to account for the large proportion of staff currently and expected to be on sick leave as Omicron takes hold.

One of the major trends during the pandemic period has been for airlines to rationalise their fleets. Taking advantage of the enforced grounding in 2020 and reduction in capacity into 2021, airlines took the opportunity to retire older aircraft type perhaps earlier than planned and then lease new aircraft or amend existing orders to ensure deliveries of new technology aircraft, which are then often financed in the sale-leaseback market. Given the continued focus on environmental concerns and some government funding having carbon emissions reduction targets baked into the contracts, all airlines are moving to a more fuel-efficient fleet, which includes transitioning to new generation aircraft as well as investing in brand new technology such as electric aircraft currently development (more on future technology on page 54).

Many airlines, in the US in particular, have reached the end of their re-fleeting programmes, which have been conducted successfully through the pandemic period, benefitting from the ready availability of financing both from the capital markets and from lessors.

As one airline treasurer noted in a panel for *Airline Economics* Growth Frontiers Dublin virtual conference on January 17 2021, the headwinds noted above are the sorts of "high class problems" traditionally facing airlines and a welcome departure from the "pandemic problems of 15 months ago of keeping the lights on".

"Similar to healthcare, police, fire, and public transportation workforces, the Omicron surge may exacerbate shortages and create significant disruptions."

Ed Bastian, CEO Delta Air Lines, in a letter to CDC director Rochelle Walensky (Dec. 21, 2021)

Challenger airlines

Debt and equity investors are confident about the return of air travel, evidenced by the creation of new leasing platforms as well as the amount of start-up airlines launched over the past two years. A downturn is usually the best time to begin an airline but especially so during this period given the keen equity backers and great aircraft purchasing and leasing deals available, many offering power-by-the-hour deals to assist with cashflow.

"We've seen multiple new airlines in the US, which is relatively unique given the stability of the market in the past five to seven years," says Darren Hulst, Vice President, Commercial Marketing at Boeing. "We've seen start-ups in emerging markets as well, including India and other parts of the global market. History has proven that a lot of start-up activity has come out of recessions and global shocks, such as 9/11 and the Global Financial Crisis, and this period will be very similar."

Many of these new airlines are filling voids in schedules created by the demise of predecessors or cuts to networks made due to the need to reduce capacity as air travel demand fell: "Equity is at a premium these days for airlines and it can be spent on many different things," notes Carlyle Aviation Partners president Robert Korn. "If they can obtain off balance sheet financing from a lessor, it allows them to deploy their precious capital in other areas. During a downturn there are opportunities for airlines to use their capital in some pretty dynamic ways, such as grabbing market share, buying up competitors, investing in partners and building infrastructure. We want to be good partners to those airlines."

Griffin Global Asset Management, formed as a long-term strategic partnership with Bain Capital Credit to create an aviation leasing and asset management platform, has also been exploring investments in airlines. CEO Ryan McKenna notes that he has spent the pandemic period looking at originating new opportunities. "We've spent a lot of our time exploring opportunities with start-ups or very low-cost or ultra-low-cost carriers," he says. "We think those business models really make sense going forward. They are disruptive to incumbents and there is certainly demand for those airlines as leisure travellers want to get to their destination in as cost effective way as possible. We have spent a lot of time trying to support carriers that fit that profile throughout the pandemic, which we will continue to do."

Although the ultra-low-cost market has a compelling business model going into the recovery, one banker warns that only well capitalised low-cost airlines or ultra-low-cost start-ups with a strong sponsor would be attractive investment opportunities. "Start-ups can access aircraft capacity at low lease rentals and benefit from crew at lower costs," he says. "But they need to be prepared to burn cash in the first year of operation until the overall market grows again."

> **"We have seen multiple new airlines in the US, which is relatively unique given the stability of the market in the past five to seven years."**
>
> *Darren Hulst, Boeing*

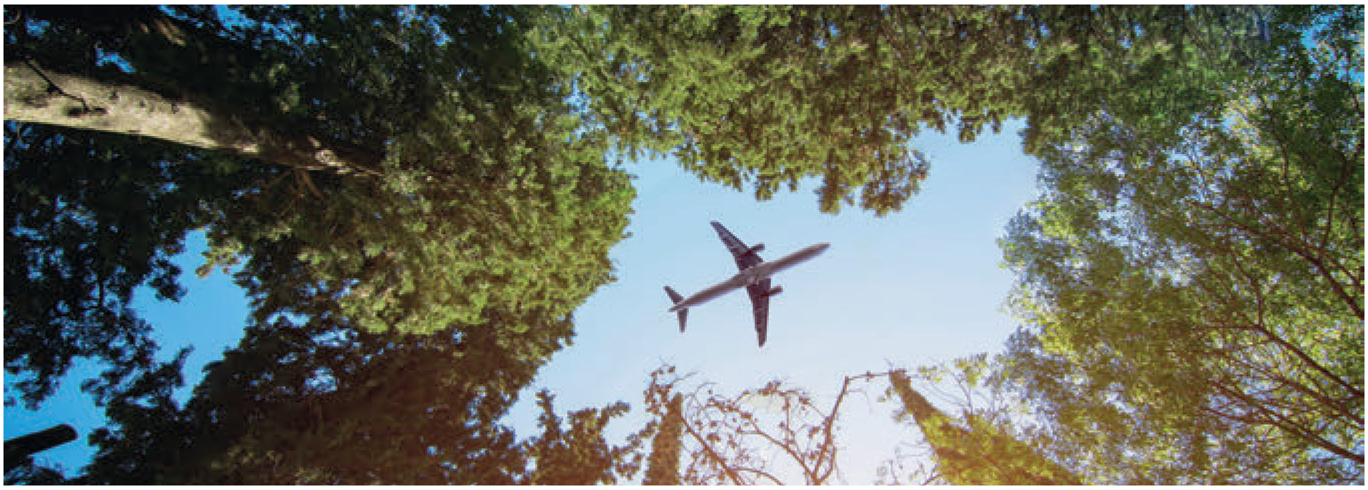
CHART 11: AIRLINES LAUNCHED IN 2021

Airline	Country
Avelo	US
Breeze	US
PLAY	Iceland
Aha!	US
Islas Air	Spain
Wizz Air Abu Dhabi	UAE
Northern Airlines	Sweden
EGO Airways	Italy
Flyr	Norway
Canarian Airways	Spain
Vietravel Airlines	Vietnam
Burundi Airlines	
Uep Airlines	Spain
Norse Atlantic Airways	Norway
Waltzing Matilda Aviation	US
SkyAlps	Italy
GlobalX	US
Grecian Air	Greece
JetSmart Peru	Peru
Ecuatoriana Airlines	Ecuador
Air Montenegro	Montenegro
Green Africa Airways	Nigeria
ITA	Brazil
Air Catalogne	France
Flylili	Romania
ETF Airways	Croatia
Alvir Airways	Pakistan
United Nigeria	Nigeria
Qanot Sharq	Uzbekistan
WestAF	Algeria
Africa Airline	Republic of Congo
Air Astra	Bangladesh
Uzbekistan Express	Uzbekistan
ITA Airways	Italy
Greater Bay Airlines	Hong Kong
FlyOne Armenia	Armenia
Zambia Airways	Zambia
Go2Sky	Slovakia

Source: Allplane

Chapter II

Aircraft Leasing: Proven Resilience



The aircraft leasing market has proven its resilience during the past year and most importantly has demonstrated just how critical its support has been for the aviation industry throughout the pandemic period.

"The pandemic has shown that the leasing business is a good business," says Aengus Kelly, CEO of AerCap. "Well-managed lessors with global platforms that are able to move assets around the world and manage the interactions with the customer base and manufacturers during times of great stress, have proven the resilience the aircraft leasing business, which is why we are seeing so much capital interested in the sector at the moment."

Aircraft lessors have succeeded in navigating the challenges of the global pandemic, helping their customers through a very difficult operating environment. Lessors have supported their airline customers in myriad ways – from providing aircraft from their orderbooks, enabling airlines to defer their own orders to free, as well as combinations of sale-leasebacks and renegotiated leases to assist airline cashflow.

"Lessors have proven to be a bastion of capital," says John Plueger, CEO of ALC. "As evidence of this shift, in 2021 lessors took delivery of 60% of all Boeing and Airbus aircraft orders combined, all placed under some form of lease, be it sale-leaseback, order book, finance lease. Clearly, the leasing component is a capital star of industry."

"During this period of airline financial and balance sheet recovery, airlines have looked to leasing in a much more significant way, which I see continuing in 2022 and probably 2023 and beyond," adds Plueger.

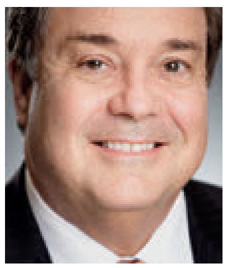
Rent deferrals spilled over from 2020 into early 2021 but began to taper off as airlines saw a return of demand in the summer. Lessors have continued to find innovative solutions for clients in order to ensure consistent cashflow. Power-by-the-hour lease agreements have become more popular, especially with new airlines and airlines undergoing restructuring. The general consensus by lessors has been to leave aircraft with defaulting lessees using PBH agreements in order to ensure some degree of cashflow remains as aircraft are not as easy to place with other customers.

"Even as painful as it has been for us, the performance of the lessors throughout the crisis has demonstrated the resilience of the model and the diversification of customers and geography, which will continue to attract capital," says Michael Inglese, chief executive officer of Aircastle.

Aircraft lessors went into the crisis already in a much stronger position than in previous downturns. "If you go back to the first Gulf War, there were ten top lessors, and nine of them were wiped out with only International Lease Finance Corporation (ILFC) surviving," remembers Fred Browne, CEO of Aergo Capital. "This time, lessors are much more resilient and robust, which reflects the fact they are so much stronger – the top 15 lessors are all backed by institutional money. Operating leasing is definitely here to stay and in my view it's going to command 60% of the fleet over the next five years."

"During this period of airline financial and balance sheet recovery, airlines have looked to leasing in a much more significant way, which I see continuing in 2022 and probably 2023 and beyond."

John Plueger,
Air Lease Corporation



Leasing market share

The aircraft leasing market has grown substantially over the course of the last several decades but the pandemic has accelerated the growth of the leased fleet. Airlines have embraced sale-leaseback transactions to monetise unencumbered assets in the frantic effort to raise liquidity in 2020 and into the first half of 2021. There is some evidence that trend is slowing as airlines access to capital markets and bank debt returns but the expectation is for the share to remain at least at 50%, with some predicting an increase to as high as 60%.

"[Sale-leaseback deals] freed up a lot of capital, which has been great for the industry," says Tim Myers, , president of Boeing Capital. "Lessors have played a tremendously important role, providing support that has benefitted the entire industry. We think there will be a much more balanced recovery going forward. There have been a number of new lessors set up that are backed by new private equity and hedge funds, which will strengthen the leasing market overall. The investment community really likes the lessor models and the investment grade lessors have performed extremely well throughout the pandemic and have put pressure on the rating agencies to upgrade their ratings. Overall, the lessor share of the market will stay in that 50% range and continue to be a major player going forward."

For SMBC Aviation Capital's Peter Barrett, the move to a greater share of the fleet was simply the natural evolution for the leasing sector. "I've always felt that the long-term secular trend was going to be for leasing to become the dominant tool for airlines to acquire aircraft and for good strategic reasons – including managing balance sheets, for fleet flexibility and the strategic development of their business," he says. "There are parallels with the hotel industry. Most hotels operators don't own the assets, they're focused on service delivery and execution of that operating product. COVID-19 has accelerated a long-term sector trend that aircraft ownership and aircraft operation will be seen as separate things."

With airline balance sheets expected to remain under strain for the next year or two, and with airlines under pressure to operate more fuel-efficient fleets, the expectation is for leasing to continue to gain market share as leasing provides much needed flexibility and capital in an uncertain market.

"The pandemic has clearly driven the leased fleet share well beyond 50% towards 60%," observes Plueger. "It is difficult to predict whether that will be the maximum level or the steady state going forward. Born of necessity, the leased share will probably stay closer to 60% but airlines will want to continue to order their own aircraft – the industry depends upon it – so I would be personally surprised if the leased share went materially above 60%."

There is a valid debate in the market considering just how much of the global fleet can be leased. Some take a similar view to Peter Barrett that it makes much more sense for airlines to lease than own their assets. "I've never thought it made sense for any airline company to own aircraft but I understand why they do since as the largest buyer they get a good deal and will fly the planes for their full life," says Cowen's Becker. "When you think about the residual value risk, especially of late model aircraft, it makes more sense to let someone else own the aircraft."

There are others – mainly the US carriers – that maintain owning aircraft has real benefits. "US airlines have traditionally owned their own aircraft because they can be efficiently financed in the EETC market and they also benefit from the tax depreciation," noted one banker. "The pandemic has required airlines to monetise all of their unencumbered assets but it remains unclear if that general shift to lessors will continue in a more stable operating environment and as airlines return to a more diversified financing strategy."

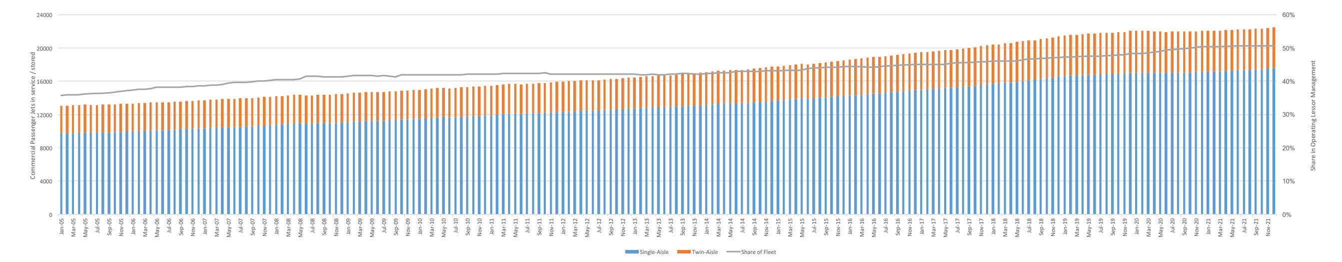
Kieran Corr, Global Head of Aviation Finance at Standard Chartered, doubts that there will be a permanent shift in the long-term trend towards a greater lessor share of the market. "Airlines use operating leases as a capacity and residual risk management tool, and to gain access to aircraft quickly and 100% financed," he says. "While in the near term, there may be a larger percentage of operating leases, those fundamental reasons for leasing will cause the longer term trend to remain the same. The percentage is hard to predict but it will be a very different story between the narrowbody and widebody market, because going forward there will be much lower lessor participation in the widebody space."

The most up-to-date data from Cirium shows that the number of leased widebody aircraft has been falling slowly from 2020 as troubled airlines return and retire certain assets.

Airlines have been encouraged to renew their fleets with the newest, most fuel-efficient aircraft to lower their carbon emissions – some have even been compelled to do so in return for government funding during the pandemic. As a result, airlines have been busy both ordering new technology aircraft from the airframe manufacturers (OEMs) and have also turned to leasing companies for fleet renewal purposes as cashflow remains constrained due to the uncertain operating environment. As Cowen's Becker notes: "Without the leasing industry, a lot of smaller airlines wouldn't survive and most would not be able to meet their re-fleeting requirements."

CDB Aviation's CEO Patrick Hannigan expects the impact of the pandemic on airline fleet decisions to resonate for a long time: "While many of the world's airlines grew their fleets through deliveries of new airplanes and often delayed airplane retirements to accommodate passenger demand over the past decade, the current market disruption will shape airline fleet strategies long into the future as airlines make decisions to renew their fleets and resume growth," he says. "Airlines will focus on building versatile fleets that provide future network flexibility, maximising capability while minimising risk, and improving efficiency and sustainability."

The demand for re-fleeting with new technology aircraft – driven by a combination of the pandemic providing a good opportunity to rationalise fleets and phase out older equipment in conjunction



Source: Ascend by Cirium

CHART 12: LEASING SHARE OF THE WORLD FLEET

with the move towards improving carbon emissions – has contributed to the popularity of leasing since many of the larger companies already had orderbook positions for attractive delivery dates. John Plueger referred to the trend for airlines to defer their own deliveries to take advantage of lessors' earlier delivery positions and off-balance sheet access to newer technology aircraft. But for airlines without an orderbook, lower production rates for new narrowbody aircraft will leave them with little alternative other than to turn to lessors with orderbooks.

Air Lease Corporation made a sizeable order (LOI) in November 2021 for 111 aircraft – 25 A220-300s, 55 A321neos, 20 A321XLRs, four A330neos and seven A350Fs – as it continued to see demand build even while the world continued to react to new coronavirus variants of concern. "We have clearly seen a resurgence in traffic led primarily domestically within geographies and continents, which has fuelled a significantly increased demand for new single aisle aircraft," says Plueger. "That strong demand is one of the reasons why we placed our recent order with Airbus, which was for almost all single aisle aircraft that also included seven A350 freighters for the first time."

With their increased market prominence, aircraft lessors are arguably even more important customers for the OEMs, a factor they recognise.

"The pandemic it has enabled lessors to divert some of their financing requirements from speculative orders into supporting the sale-leaseback market initially to provide the liquidity. That allowed us to readjust our skylines with the lessors going forward as airlines work to manage their fleets and determine the most efficient way for them to come out of the pandemic," says Boeing's Myers. "Lessors continue to be extremely important to the OEM for both the single aisle, twin aisle and freighter market. The OEMs and the lessors need continue to partner going forward to ensure the right kind of balance. The OEM's job is to continue to look at the supply demand economics in the marketplace, and to make sure that we're working together with all of our customers."

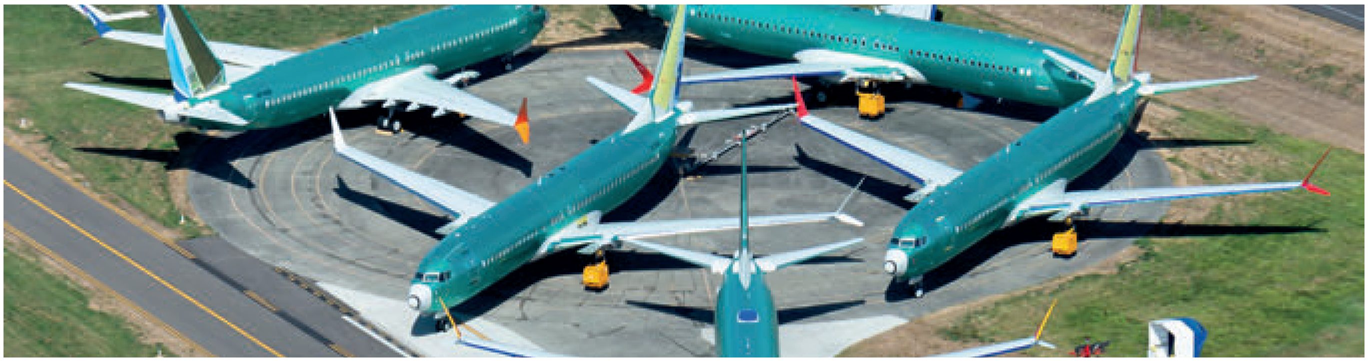
Paul Meijers, EVP – Commercial Aircraft Leasing, Trading & Financing, Airbus, notes that even pre-pandemic leasing companies were financing more than 50% of OEM deliveries. "That figure has increased further over the past two years and lessors will continue to account for the major share of our deliveries," he says. "There is a lot of new capital flowing into the leasing space, with new players backed by private equity that are developing their portfolios. We see a lot of appetite for growth in the leasing markets, which we expect to continue to develop over the next year."

Although most lessors have a realistic view of their buying power with the OEMs, even the largest lessor doesn't see any meaningful shift in the relationship

CHART 13: TOP TEN AIRCRAFT LESSORS (BY PORTFOLIO VALUE)

Manager	TP	RJ	SA	TA	Total Portfolio	On Order	Est Portfolio Value ($mn)	Current Rank
AerCap	20	111	1,483	356	1,970	473	43,561	1
SMBC Aviation Capital			469	59	528	199	17,216	2
Air Lease Corporation		2	354	116	472	304	17,023	3
Avolon			470	126	596	226	16,858	4
BOC Aviation			335	83	418	109	14,543	5
BBAM			324	117	441		13,572	6
ICBC Leasing		22	383	52	457	95	13,162	7
Aviation Capital Group			340	15	355	47	8,473	8
DAE Capital	68		249	60	377	10	8,077	9
Bocomm Leasing		10	222	30	262	30	7,421	10

Source: Ascend by Cirium



between OEMs and lessors. "Everybody says they get a great deal with the OEMs, but they don't," says AerCap's Kelly. "The airlines might get a lower price initially than some of lessors, but then the OEMs will stack the order so that they know the airlines will have to come back and defer airplanes and then they'll reprice them and hold onto their PDPs. The OEMs certainly have a greater appreciation for the necessity of lessors – lessors are now buying over 50% of all the aircraft the OEMs produce – but there are only a few customers they care about. All they care about from the lessors from an order perspective is that they can pay for the aircraft and lease the aircraft. Many lessors struggle with the placement task particularly on widebodies but what really separates lessors in the eyes of the OEM is if they have the market power to influence airline fleet decisions and the timing of these decisions."

"The OEMs certainly have a greater appreciation overall for the leasing industry but what's more likely to happen is that we will probably see the price that lessors and airlines pay for assets close significantly," adds Kelly. "We're seeing the gap narrowing already."

Standard Chartered's Corr agrees that there will not be a shift in relations between lessors and OEMs. "The bigger players have always had some influence on what the OEMs are developing but I don't see a future where lessors gain such a predominant voice that suddenly Boeing and Airbus will only produce a plain vanilla A320 Neo in max density forcing airlines to find some other way to differentiate their product to passengers."

Aviation Capital Group (ACG) has had a long partnership with the OEMs and CEO Thomas Baker sees that continuing for the foreseeable future. "We have demonstrated to the OEMs throughout the pandemic that we are strategic partners and that working together is all our interests," he says. "They have constraints, they've got challenges, and demanding customers that they need to please, and sometimes we have to compete for their affection. But there is a path forward so long as they can deliver aircraft on time."

Baker expects lessors to place more direct OEM orders in the future to gain access to new technology assets. "I think you'll see bifurcation on this issue with a number of large global lessors that are seeking to grow through multiple channels, which have access to capital and confident in their ability to secure financing," he says. "Those lessors will continue to grow their orderbooks over time, particularly with new technology aircraft. And then there is a whole bunch of smaller lessors, without flexible corporate level access to capital that need to fund through secured vehicles or warehouses or fund on a match asset or match funding basis. Orderbooks are tougher for those players. But you will start to see a number of lessors with the capability and the confidence to grow their order books. And the rest will focus on the sale-leaseback channel."

ACG grew its orderbook in December 2021 with an order for 40 A320neo Family aircraft, of which five are A321XLRs, as well as signing a Memorandum of Understanding (MoU) with Airbus for 20 A220s. With this order ACG is supporting the recently launched multi-million dollar ESG fund initiative by Airbus that will contribute towards investment into sustainable aviation development projects (see page 54 for more on the ESG fund).

"We have demonstrated to the OEMs throughout the pandemic that we are strategic partners and that working together is all our interests. They have constraints, they've got challenges, and demanding customers that they need to please... there is a path forward so long as they can deliver aircraft on time."

Thomas Baker, Aviation Capital Group

CHART 14: TOP 30 LEASING COMPANIES (RANKED BY NUMBER OF AIRCRAFT)

Manager	Total Portfolio	On Order	Est Portfolio Value ($mn)	Current Rank
AerCap	1,970	473	43,561	1
Avolon	596	226	16,858	2
SMBC Aviation Capital	528	199	17,216	3
Nordic Aviation Capital	483	70	3,867	4
Air Lease Corporation	472	304	17,023	5
ICBC Leasing	457	95	13,162	6
BBAM	441		13,572	7
BOC Aviation	418	109	14,543	8
DAE Capital	377	10	8,077	9
Aviation Capital Group	355	47	8,473	10
Carlyle Aviation Partners (inc. AMCK Aviation)	326 (459)	(20)	4,314 (7,070)	11 (6)
Aircastle	267	22	3,938	12
Bocomm Leasing	262	30	7,421	13
CDB Aviation	255	115	7,411	14
Castlelake	244		3,700	15
ORIX Aviation	217		4,858	16
AVIC International Leasing	200		5,932	17
Jackson Square Aviation	198	22	6,456	18
Macquarie AirFinance	189	49	2,251	19
Goshawk	182	40	4,836	20
Boeing Capital Corp	172	23	1,100	21
China Aircraft Leasing Company	156	263	3,396	22
Deucalion Aviation	136		1,916	23
AMCK Aviation	133	20	2,756	24
Falko	129		1,140	25
Cargo Aircraft Management	127		1,698	26
CMB Financial Leasing	127		3,783	27
Standard Chartered Aviation Finance	122		2,905	28
CCB Financial Leasing	115	50	3,610	29
GTLK - State Transport Leasing Company	112	58	1,755	30

Source: Ascend by Cirium

All in service & stored jets and >50 seat turboprops (TP) managed by operating lessors, all roles (owner/asset manager), on order excluded from estimated portfolio value.

Scaling Up

Mergers and acquisitions (M&A) activity has characterised the aircraft leasing market in 2021. AerCap announced its definitive agreement with General Electric to acquire 100% of GE Capital Aviation Services (GECAS) for a total value of approximately $30bn in March 2021. AerCap's acquisition of GECAS has changed the dynamic of the aircraft leasing market. Dubbed a super lessor, with a fleet of close to 1,970 aircraft, AerCap now towers above the rest of the leasing sector.

"You have one huge lessor now and then everybody else," notes Becker, who adds that scale is important because it provides a unique insight of the market. "AerCap and Avolon have proven that it makes sense to be big. They get the first call and they know everybody, they know where aircraft are, they know how to get aircraft. They also don't play in the lower quality sale-leaseback market as they tend to deal more with the OEMs."

Scale and its importance is an oft-debated concept in aircraft leasing but none more so than in 2021. As head of the world's largest lessor, AerCap CEO Aengus Kelly, sees the tremendous benefits such scale brings to the business. "In any space you have the innovator, the imitator and blithering incompetents," he says. "We will continue to see a general consolidation trend; the benefits of scale are just too important. [Those benefits are realised] with the airlines, with the MRO shops, the engine MROs, with the engine manufacturers... and if you don't have extremely competent people in the business, managing the metal and the engines, you can lose an awful lot of money very quickly. Generally speaking, with scale you just tend to have better people, more people, and you have better access and more leverage with suppliers."

Kelly views consolidation as a positive move for the leasing industry, which he says has been a "fragmented industry for too long". With AerCap and GECAS, followed by Carlyle Aviation Partners' acquisition of FLY Leasing and then AMCK Aviation (in addition to the finalisation of the widely rumoured SMBC Aviation Capital's acquisition of Goshawk and Falko's sale), the past 12 months have been the busiest year for M&A in the leasing sector since AerCap acquired ILFC. Kelly foresees a "snowball effect" as lessors viewing these latest consolidation deals will worry about being left behind and becoming less competitive. "There will always be room for start-ups, and smaller players who are very good at what they do," Kelly notes, but warns that the days of smaller leasing entities trying to serve all markets are numbered. "Smaller lessors will need to focus on an area of expertise because the larger companies will only get bigger."

One such enlarged company is Carlyle Aviation Partners, which grew rapidly from its foundation as Apollo Aviation founded by Robert Korn and Bill Hoffman just after 9/11 to a mid-sized institutional asset manager, which was sold to Carlyle Group in 2018. The team has continued to grow the platform, implementing its decision to evolve from a mid-to-end-of-life lessor into a full-service aviation finance platform, which it has achieved with the acquisition of FLY Leasing and now an agreement to acquire AMCK.

"Throughout our 20 years in operation, we have always looked at thoughtful opportunities to grow the business," says Korn. "We believe that scale is important, and being able to offer a broader range of financing solutions to our industry partners should allow us to better compete on behalf of our investors."

Carlyle Aviation Partners completed its acquisition of Fly Leasing (FLY) in August 2021, although the deal was first announced in April. Under the terms of the agreement, FLY shareholders received $17.05 per share in cash, representing a total equity valuation of approximately $520m. The total enterprise value of the transaction is approximately $2.36bn. FLY's portfolio of 84 aircraft and seven engines is on lease to 37 airlines in 22 countries. The per share cash consideration represented a premium of approximately 29% to FLY's closing price on March 26, 2021.

AerCap's twice in a generation deal

When AerCap's acquisition of International Lease Finance Corporation closed in 2014, Aengus Kelly, CEO of AerCap, described the purchase of ILFC as a "once-in-a-generation opportunity", noting that the last time an opportunity of that size arose was when GE bought several hundred airplanes from GPA, which effectively started GECAS. With the acquisition of GECAS, AerCap has repeated that success.

AerCap-GECAS negotiations were at their height in December 2020 when the industry was still reeling from the impact of the virus and COVID-19 vaccination programmes were still in their infancy. Despite the tense environment, AerCap was able to secure a bridge financing facility for $23bn, which was fully underwritten by Goldman Sachs and Citi. For Kelly, securing this financing was absolutely key to closing the acquisition of GECAS.

"You need to make sure that you are in a position where you don't have to go to the capital markets," says Kelly. "Similar to ILFC, and with GE, there's no way that either of those transactions would have happened if we didn't have the committed funding in place."

The bridge financing agreement was negotiated in tandem with the GECAS acquisition negotiations. "Citi and Goldman underwrote the whole facility in full themselves because we wouldn't allow them to syndicate it prior to closing because we didn't want anyone to know what was happening," shares Kelly. " And so they took it on the best part of $12 billion each themselves. We had to pay a lot of money for that on the day we signed the transaction, but it is what allowed us to close the deal."

Citi and Morgan Stanley acted as financial advisors to AerCap for the GECAS transaction. PJT Partners LP, Goldman Sachs, and Evercore acted as financial advisors to GE.

Cravath, Swaine & Moore, McCann FitzGerald and Nauta Dutilh acted as legal advisors to AerCap, with KPMG acting as tax advisers. Paul, Weiss, Rifkind, Wharton & Garrison, Clifford Chance and A&L Goodbody acted as legal advisors to GE.

There are few companies in the aviation sector that could have executed a deal of this magnitude. As a public company, AerCap was able to leverage its position to structure a transaction that involved cash and shares, which in a downturn scenario, sweetens the deal for the seller.

Under the terms of the deal, AerCap acquired $34bn of GECAS net assets, paying GE $24bn in cash, $1bn in AerCap notes and/or cash upon closing, and 111.5 million ordinary shares, which was equivalent to approximately 46% ownership of the combined company with a market value of approximately $6 billion on March 9, 2021. GE has already witnessed the upside in the deal structure, since its 46% equity stake in AerCap was valued at approximately $6.6 billion as of October 29, with further upside potential since GE's shares in the new company are subject to a staggered lockup period allowing GE to dispose of a third of its stake after nine months post close, a third after 12 months, and the entirety of its stake after 15 months.

This financing strategy was copied from AerCap's successful acquisition of ILFC in 2014, but it was first used when AerCap acquired Genesis in 2009. "One of the biggest advantages of being a public company is that you have an acquisition currency. In 2009, when we acquired Genesis, which was a listed company, there was another cash bidder, but the Genesis Board realised that if they sold for cash their shareholders would have locked in their losses in the middle of the financial crisis, so we offered them stock to provide some upside to shareholders."

It was a similar story with ILFC, says Kelly: "I said to Robert Benmosche the CEO of AIG that there was going to be a recovery and explained that although on paper there is a significant day one loss, with a large shareholding in AerCap, AIG would be able to benefit from the return to travel. With Larry Culp, the CEO of GE, it was the same playbook. GE is the largest engine manufacturer in the world and so had a wide lens on the aviation business so he could also see that a recovery was coming and that this deal was an opportunity to effectively reverse engineer an IPO of GECAS and have a way to play the up cycle in aviation."

Although a large proportion of the GECAS transaction was settled with

Click here for the full video interview with Aengus Kelly

AerCap shares, the company still needed to raise an eye-watering amount of debt to meet the $24bn cash portion and refinance the expensive bridge facility.

For Kelly, the incredible response to the debt offering was not only a great endorsement of AerCap by the capital markets. Banks also showed that the market had tremendous confidence in the sector.

Following the closure of the GECAS transaction, AerCap now has a portfolio of over 2,000 aircraft, over 900 engines and over 300 helicopters, as well as an order book of approximately 450 new technology aircraft. New technology aircraft represent approximately 56% of the combined in-service fleet, which is expected to grow to approximately 75% in 2024. The combined company serves approximately 300 customers around the world and is now the largest customer of Airbus and Boeing. Such scale has led to AerCap being labelled as a super lessor.

The combination of AerCap and GECAS has created a best-in-class aircraft trading platform with deep market insight and relationships, which combined have sold on average over $5 billion of assets per year over the past four years.

AerCap and GECAS have already started on the lengthy journey to integrate the two companies. "We are focused on making sure that all of our people understand the objectives and the culture of the business. We've never had a parent; there's no 1-800 Billion phone number for us, we are on our own. But this is what has driven us forward. For now, we are making sure that our way of doing things is instilled throughout the business, and then the rest will look after itself," notes Kelly.

For Carlyle Aviation, the attraction was the portfolio, which had very few widebodies to remarket, and it was acquired at an approximate 30% discount to book value of the portfolio that had already been impaired.

CK Asset Holdings confirmed on December 23 that it had agreed to sell its portfolio of 125 aircraft managed by AMCK Aviation (previously Accipiter) to an entity managed by an affiliate of Carlyle Group for $4.28bn. The transaction also includes an order book for 20 Airbus narrowbody aircraft.

The transaction is expected to close in the second quarter of 2022, pending regulatory approvals. Goldman Sachs is leading the acquisition financing for the transaction. Milbank is acting as legal counsel to the Carlyle Aviation Partners managed investment vehicle with Kirkland & Ellis advising on the formation of entity acquiring the portfolio.

Carlyle Aviation Partners had three active platforms at the beginning of 2021. A dedicated pre-delivery payment (PDP) financing platform, a young aircraft leasing strategy, and a mid-life leasing strategy. "The FLY acquisition fit very well into our mid-life leasing strategy," says Korn. "We viewed it as a ready-built portfolio that had very similar attributes to what we might have historically constructed from five or six smaller transactions with other lessors/traders, so it was a very efficient way to acquire assets. AMCK was a little different. We believe it's a very good portfolio that had been thoughtfully constructed by CK and the management team, and has performed well during the pandemic. When we were initially shown the opportunity, we knew these were assets we wanted to manage and had confidence we could create value from them. We were pleased to partner with one of our current investors to underwrite the opportunity.

In a notice to the stock exchange in December, CK Asset noted that the reason for the sale was due to the "paradigm shift in the aircraft leasing sector" where the "risk and return dynamic has become volatile and unpredictable", which the industry has mitigated by increased consolidation, mergers and acquisitions. Adding that following the internal consolidation of its aircraft leasing business, CK Asset considered it an "opportune time to exit the aircraft leasing sector" allowing the company to "unlock the underlying value of its aircraft portfolio and realise a satisfactory gain".

CK Asset confirmed that its aggregate profit from the sale would be approximately US$170m, which would be utilise for general corporate purposes.

In the video interview with *Airline Economics* and KPMG, Robert Korn noted that CK Asset as an investor in multiple industries, decided they could achieve better results with their capital outside of aviation. He says: "From our standpoint, they created a fantastic portfolio that we and our investors are very excited about."

Carlyle Aviation's acquisition spree, once closed, will catapult the company solidly into the top ten largest leasing companies ranked by number of aircraft.

The sale of Goshawk is also expected to close shortly, with SMBC Aviation Capital rumoured to be the prime bidder for that portfolio. Should this deal close successfully, SMBC Aviation Capital would become the second largest lessor by portfolio size and a total value.

With the sale of regional aircraft lessor Falko also believed to be in its final stages, further consolidation is likely heading into 2022 and beyond, mainly characterised by large portfolios with large-scale platform sales unlikely save for in a distressed scenario.

For ALC's Plueger, although consolidation in the leasing market is increasing, it is being balanced with new entrants into the space: "There is new capital coming into the space from a variety of sources, and from some of the bigger private equity names, which has continued," he says. "So while some of the faint of heart investors have exited, there is this phenomena where there is more consolidation, but at the same time new capital in entering the marketplace. That has always been the case over the past 10 years. Some 10 or 15 years ago many of the Chinese lessors were just entering the space, so the situation now is really nothing new. Those coming into the space want to capture the recovery they see ahead. They want to be in on the

"We believe that scale is important, and being able to offer a broader range of financing solutions to our industry partners should allow us to better compete on behalf of our investors."

Robert Korn,
Carlyle Aviation Partners

initial phases, which is understandable. This has given other lessors pause that perhaps they might want to grow a little bit more, have a bigger scale."

DAE Capital, which bought AWAS in 2017, has always been in favour of inorganic growth, and CEO Firoz Tarapore expects the larger leasing companies to continue to grow. "Scale continues to be defined upward," he says. "To manage the more pronounced and complex risks that we see today and which were highlighted over the past 21 months, there's no such thing as too much capital to the extent we can use that to further provide the stability that our clients need… particularly as they re-fleet and regrow their business." Tarapore adds that it is the reliability of counterparties that has proven to be very important to airlines during this period of uncertainty – they need to know lessors can deliver on their promises, and from that perspective he agrees that size is of consequence. "The top 10 lessors are probably going to get bigger as a group because other than the very top, there is still scale headroom that is quite material relative to the current size of number two to number 10," he says.

For SKY Leasing, a relatively new and mid-sized leasing company, CEO Austin Wiley agrees that scale is important when dealing with the airlines to be able to negotiate large portfolio deals but adds that these are not the preserve of the top lessors, noting that SKY has closed a 10-aircraft deal with a single airline in 2021. "The consolidation of lessors like AerCap and GECAS will force some reflection amongst the top 10 or top 20 lessors, but we should not necessarily expect a material amount of consolidation to follow. The shareholders across the top 20 lessors are very stable, they're happy with their businesses, and it doesn't seem like there is a need to grow beyond what is organically available in the market."

The lack of significant sellers will limit the scale of consolidation in the leasing market as ORIX Aviation's James Meyler explains: "While there is certainly a strong appetite for consolidation and for growth especially in the top 15 lessors, there are actually very few sellers in the top 15; almost all of them are trying to grow their book," he says. As a result Meyler expects acquisitions of smaller portfolios by the larger lessors to continue due to opportunistic sales or changes in business strategies that would allow some of those top lessors to grow their book. "I think all of them would love to buy a big lessor but there's very limited availability for that."

Meyler expects the top leasing companies to grow their books in the short-term at a pace the mid-table lessors may struggle to match. "I can see the top two to five lessors reaching a thousand aircraft in the short term," says Meyler. "Whether that's through acquisitions of other platforms or quite possibly just through the aggressive acquisition of assets. Although we have a very competitive space right now, as most of the airlines start to get back on stream, probably from 2023 onwards, and their order streams are back flowing at full capacity, many airlines will move to the sale-leaseback channel either for existing aircraft in their fleet or for new order deliveries. That is going to be the big opportunity for some of the lessors to move at scale without an M&A transaction."

"For leasing companies with portfolios of around 300-500 aircraft, it may not be sustainable for them to acquire enough aircraft organically to retain their position at the top of the table, since the leading lessors below AerCap, Avolon and SMBC Aviation Capital continue to grow their books towards 1,000, competitors would need to double their fleet every five years to just hold their position in the leasing space," adds Meyler.

Even though many lessors expect consolidation to continue, they also expect the aircraft leasing sector to expand as even more new leasing companies enter into the market. "Lessors don't need a $10bn-plus fleet size to participate in these multi-aircraft sale-leasebacks," says SKY's Wiley. "And airlines don't want to be overly reliant on any one lessor so they can ask for help if they need to restructure. If anything, what we've seen over the last three to five years is more leasing companies and platforms emerge rather than less."

"Scale continues to be defined upward. To manage the more pronounced and complex risks that we see today and which were highlighted over the past 21 months, there's no such thing as too much capital."

Firoz Tarapore, DAE Capital

Competition Intensifies

Further down the leasing ranking table are the medium-sized lessors and asset managers that thrived during the boom years but some of which have suffered the most during the pandemic as restructuring airlines tend to opt to return aircraft to their smaller leasing counterparties to lean on assistance from their larger lessors.

Heading into the recovery over the next two years, in order to remain competitive, these sorts of lessors will be facing a tough fight for deals with such large lessors dominating the market. That competitive pressure, warns Becker, may result in those companies taking larger risks. "[The smaller lessors] are going to fall behind and so will have to take on more risk, which means lesser quality on credit," she says. "This is a sort of a catch-22 situation because they will take more risk with whom they place their aircraft, which means charging a higher rate to cover their higher cost of capital. But because most airlines are still struggling financially, they won't be able to afford a higher rate."

Some middle-sized lessors have been able to capitalise on the many sale-leaseback opportunities, having entered the pandemic period with little or no exposure, and with deep cash reserves. Such companies include SKY Leasing, Aergo Capital and Bain Capital's Griffin Asset Management.

Aergo Capital is navigating the current crisis from the strong position. Back in 2017, the team began to position the business for a downturn it was expecting following the elongated growth cycle the aviation industry had enjoyed for more than a decade. When alternative investment manager CarVal invested in Aergo in 2014, the company rapidly increased its portfolio to 80 aircraft worth approximately $1.5bn. By the time the pandemic hit, Aergo had reduced its portfolio from approximately 80 aircraft to just 20. As a result of that prudent planning, Aergo reduced its exposure to the wave of defaults in the marketplace following the early impact of the pandemic crisis, which has resulted in it having a significant amount of capital to deploy and more time to consider new opportunities.

"We're more like a boutique lessor; we're very opportunistic," says Fred Browne, CEO of Aergo Capital. "We look for value deals, rather than being pigeonholed in one particular niche, we've looked right across the whole spectrum of the aviation market and have financed new narrowbodies including Neos and MAXs but we have also found value in some widebodies and turboprops."

Aergo Capital has also recently launched a structured products division, which Browne states would not have been possible in the pre-pandemic period. "With such stress in the aviation market, Aergo is very well placed to finally launch a structured products division, which would have been much more difficult in the benign decade leading up to the crisis," says Browne. "This sort of business needs stress; it needs opportunity; it needs experienced people; and it needs capital."

With secure backing from CarVal, an experienced management team led by David Power – who headed up ORIX Aviation for more than 15 years until late 2018 – Aergo's Structured Assets Products was formed to capitalise on the opportunities presented by the stressed environment. "We were expecting a downturn in the market but we have now been pitched the greatest one ever, so ironically, it's been a perfect opportunity for us to set up this division," says Browne.

"This kind of capital plus fee-earning investment banking style business complements the pure leasing business as its very accretive, it contributes greatly towards platform costs and market relevance and redefines our business – it's a great business to tack on to a traditional leasing and trading business," he says.

Aergo has subsequently invested serious resources in building an effective platform to capitalise on the opportunities created during a downturn. Power has wasted no time in originating new business and closed his first deal for the structured products division upon joining the company in September 2020, involving the reconfiguration of an 737-800 for an innovative alternative use; also acquiring and financing of one 2006-vintage A321-200 aircraft from Global Knafaim Leasing. The aircraft was sold with an existing operating lease to British Airways, financed by Volofin Capital Management. Since then the team has executed on $2bn in assets.

More lessors have been willing to step up as lenders for their clients as airline demand for liquidity increased. Castlelake set up a debt fund in a bid to provide more capital solutions to its leasing clients. Castlelake's Aviation Lending Program, set up at the end of 2020, was created to leverage the leasing platform's existing airline and investor relationships to provide financing solutions for aircraft buyers, utilising mezzanine, senior secured and high loan-to-value (LTV) financing. The program was dubbed a "natural extension" of the company's longstanding investment strategy in aviation but it is also highly opportunistic and mindful of airlines need for funding, which will only increase as aircraft deliveries ramp up once more.

SKY Leasing also entered the crisis on a positive footing having closed its first aircraft leasing fund in October 2019 with a $300m equity investment from M&G Investments (M&G) and closed a $600m warehouse debt facility in January 2020. As result, SKY headed into the pandemic without having deployed any capital and with zero exposure. Capitalising on the opportunities presented by the crisis period, SKY has increased its portfolio with new and young to mid-life aircraft with approximately $2.5bn in value, with ambitions to increase that figure annually by $1-1.5bn.

"We were fortunate to be able to select the airlines and the opportunities we wanted to pursue without much of a legacy fleet pre-COVID," says SKY CEO Austin Wiley. "Our thesis at that time was that airlines with large domestic markets and with exposure to short-haul and leisure traffic were going to perform the best during this crisis and ultimately recover the quickest in 2021. We've largely seen that play out. And so our airline customers have performed really well. We continue to see great opportunities with that customer base and have actively expanded this year, particularly in Latin America, where we've been able to partner with a number of airlines, as part of their restructuring process coming out of bankruptcy."

Griffin Global Asset Management – formed as a long-term strategic partnership with Bain Capital Credit to create an aviation leasing and asset management platform – has also been very fortunate in that it wasn't exposed to any restructuring having set up only shortly before the pandemic period.

Led by Ryan McKenna, Griffin has evolved quickly from its initial deal with Virgin Atlantic in January 2021 with a sale-leaseback transaction for two 787s to securing a $1bn warehouse funding facility structured by Goldman Sachs for Palisade Aviation, a joint venture between Griffin and Bain Capital Credit, that included innovations to provide maximum flexibility to offer airline partners a variety of financing solutions. The company also placed its first direct OEM order for five new Boeing 737-8s, which is only a stepping stone to bigger things, according to McKenna, who has spent many months analysing opportunities for investment in strong established carriers but also for start-up airlines, especially in the low-cost and ultra-low-cost segment. "Going forward, we think they're disruptive to incumbents and there certainly is a demand at that level of the leisure market, to get to their destination in as cost effective of a way as possible," he says. "And so we've really spent a lot of time trying to support carriers that fit that profile throughout the pandemic, which we will continue."

While some lessors have been aided by timing more than anything else with the

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*Austin Wiley,
SKY Leasing*

pandemic period coinciding perfectly with the closure of their initial fund raising, existing lessors and smaller asset managers have been managing their exposures and finding ways to both serve their customers but also keep those cashflows moving. ABL Aviation is one such company. The team, led by CEO Ali Ben Lmandi, have worked hard to both restructure existing leases and financing structures as well as raising fresh equity with new joint venture partners.

In November 2021, ABL Aviation announced the creation of a joint venture with new equity partner, alternative investment manager, Ellington Management Group, to invest in commercial aviation assets. The two companies formed the first blind mid-life aircraft investment pool in the post-pandemic period with a strong commitment from Ellington to invest up to $800m in aircraft assets.

The JV was arranged by Mizuho, which led the successful search for a new equity partner for ABL Aviation that builds on its strategic partnerships already held in Japan.

The new venture allows for flexibility across asset types, asset age, duration, structures and jurisdictions. ABL Aviation will act as servicer and manager for all aircraft, while Ellington will provide financial and strategic support.

Formed in 2014, ABL Aviation's main vision was to create an independent asset management platform led by three differentiating principles: innovation, efficiency, and global presence. As an independent manager, ABL Aviation was able to be adaptative and flow with the cycle. The company was originally focused on mid-life aircraft and high yielding investments, but market conditions forced Ben Lmadani to re-define that strategy and in 2018 switched to the new aircraft segment following the execution of an exclusive partnership with a financial institution in Japan, which provided $1 billion of asset value in permanent capital for JOL and JOLCO transactions.

The new venture with Ellington, an alternative investment manager, enables ABL Aviation to opportunistically deploy capital outside of the Japanese market and again consider mid-life assets.

To date, ABL Aviation has completed 43 aircraft transactions totalling more than $2.5 billion of capital deployed for major airlines including Lufthansa, Delta, Pegasus, EVA Air, EL AL and Wizz Air since its inception, 11 of which have been in the past 12 months.

ABL Aviation has continued to serve its customers throughout the pandemic period but Ben Lmadani notes that some banking relationships have been strained during this time. The global pandemic has demonstrated clearly that the commercial aviation industry is a relationship business, which Ben Lmadani has always understood. "People forget we're in a business of relationships," he says. "COVID-19 has led to lots of hedge funds and venture capitalists entering the industry, thinking that they can do some business very quickly, but they forget that we are in the business of relationships. As a young company, ABL Aviation works very hard to build and maintain those relationships. Relationships are built in good times and bad times, but people are going to remember who failed them in the bad times."

Waves of liquidity are entering the aviation market at all angles from the top of the market, focused on new technology assets, right down to the bottom to the mid-life and end-of-life assets, providing both equity and debt.

"Between 2014 and 2020 a lot of new capital entered the sector," notes AerCap's Kelly. "Some has done well; some has not. Those that thought it was a spread business probably have not done well, and will probably exit the market. But those who understood the risks in the business and worked with competent teams and platforms and that are committing additional capital to the space have done well and that trend will continue."

The already overheated market has become even more competitive as the recovery has begun, as new money is entering the market, and especially since the supply of new aircraft remains constrained both due to lower production rates and the fallout from the problems the OEMs have been experiencing with certain aircraft types. Although the MAX is now flying and performing well by all accounts, the issues with the 787s are lingering and causing some disruption in the market – to Airbus and

"COVID-19 has led to lots of hedge funds and venture capitalists entering the industry, thinking that they can do some business very quickly, but they forget that we are in the business of relationships."

Ali Ben Lmadani, ABL Aviation

the A350's benefit. The sale-leaseback market – which had been notoriously overheated pre-pandemic with lease rate factors rumoured to have dropped to extremely low levels of 0.4 – enjoyed a brief renaissance of sensible margins immediately post pandemic in 2020. However, that began to taper off in 2021 when more competitors entered the market eager to gain market share quickly with good credits.

"The market is reacting to the supply and demand dynamics that we're dealing with right now," notes SKY's Wiley. "Both manufacturers are producing significantly below pre-COVID levels, with essentially the same or potentially even more dollars chasing those reduced deliveries coupled with historically low borrowing rates, it's natural that there would be pressure on pricing as a result."

Wiley expects the spreads to remain healthy especially as the quality of the airlines that continue to take aircraft must be taken into consideration. "In our view, the issues around low lease rate factors will probably get resolved over the next 12 to 18 months," he says. "Both the manufacturers are increasing their production rates, which will naturally bring more supply, more opportunities in the market and create a better supply demand dynamic."

One aviation banker views this market dynamic as a positive for cash-strapped airlines, commenting: "Tier 1 airlines with new technology narrowbodies will get very low rents -between 0.5 and 0.6%. New technology widebodies will attract higher lease factors due to longer recovery for international long haul. However, airlines could get classic widebodies capacity from lessors desperate to place some returned aircraft at low rents. When inflation kicks in, we expected the lease rents for new technology aircraft to increase with a delay upon renewal of leases."

The sale of GECAS has removed GE from the engine leasing market, which formed part of GE's plan to break up the company into three global public companies focused on aviation, healthcare, and energy. Tom Barrett, CEO of Engine Lease Finance (ELF) notes that there are now fewer competitors in the engine space but it remains hugely competitive: "We have really tough competitors in the space, all of which are very well capitalised, well-funded, well-resourced and anxious to grow," he says. "There has been a bounce back in demand and as a consequence the sale and leaseback activity in 2021 has been the most competitive environment we've ever been in, with lease rate factors again falling to ultra-low levels."

Existing mid-sized lessors remain under pressure from the multiple start-up platforms that have been created with private equity funding over the past few years. Most recent examples include Vmo Aircraft Leasing, set up by industry veterans Bob Brown – the former CEO of Vx Capital – and Vx co-founding partner Will Hudson with colleague Sean Sullivan, backed by fund managed by Ares Management Corporation; as well as investment fund, FitzWalter Capital Partners, which says that it is committed to building a leasing platform and acquiring aircraft at a time when the industry is going through a difficult time.

Private equity-led entities, new to the aviation space, have been criticised for the use of more aggressive tactics uncommon in the aviation industry, buying up debt to take control of distressed assets in such a way that is detrimental to junior investors. Investment funds have a very different view. In distressed scenarios, these companies claim to be providing much-needed liquidity and enabling senior lenders to exit difficult situations rather than remain bogged down in lengthy and costly restructuring negotiations with lessees.

SKY's Wiley comments more positively on the uptick in new lenders entering the space, which he says are looking to fill the void left by the traditional bank lenders that have left the space due to regulatory or risk management factors. "They have provided a nice complement to what the capital markets or the unsecured lending market have to offer but that product is a bit narrow today relative to where it will be three or five years down the road. Certainly when we talk to our institutional investors, there's an increasing interest in playing in multiple parts of the capital stack. What's exciting to us is that we can provide potential solutions for such investors by effectively tranching these transactions within their portfolios."

"There has been a bounce back in demand and as a consequence the sale and leaseback activity in 2021 has been the most competitive environment we've ever been in, with lease rate factors again falling to ultra-low levels."

Tom Barrett,
Engine Lease Finance

The sheer scale of corporate debt issued by aircraft leasing companies over the pandemic period – aided considerably of course by the $21bn AerCap issuance – has ensured that the aircraft leasing sector is a situation that viewed as a niche market by investors, a situation that is only improving.

"This is not a cottage industry anymore," says Srinivasan. "There's been a sea change between how aircraft leasing was viewed post and pre-Global Financial Crisis. It is now a very well followed, very well tracked sector. If you look at aircraft lead leasing as a function of the unsecured market, now there are multiple players that have been constantly tapping that market. You're seeing a lot of equity research on the public companies there. You're seeing a lot of debt research on the unsecured issuers. This is a very mature industry right now."

In October 21, AerCap successfully refinanced the $23bn bridge facility provided by Citi and Goldman Sachs for the acquisition of GECAS with an immense $21bn multi-tranched debt offering, which was phenomenally well received as the deal generated $74bn of demand from more than 400 investors around the world.

AerCap's $21bn funding package comprised a number of senior notes offerings in varying tenors: $1.75bn two-year 1.15% notes; $3.25bn three-year 1.65% notes; $1bn 1.75% three-year notes; $3.75bn 2.45% five-year notes; $3.75bn 3.00% seven-year notes; $4bn 3.30% senior notes due 2032; $1.5bn 3.40% senior notes due 2033; and $1.5bn 3.85% senior notes due 2041. The package also contained $500m two-year floating rate senior notes. The bonds were rated Baa3 / BBB / BBB- by Moody's, S&P and Fitch, respectively. The 2032 notes represented the first senior unsecured 20-year bond issuance by an aircraft lessor.

On November 1, 2021, AerCap closed $1bn 1.899% senior notes due 2025, which were issued to a subsidiary of GE. AerCap also closed a $2bn secured term loan issued by indirect subsidiary Setanta Aircraft Leasing DAC (Setanta) and in addition, on November 2, completed a $2bn seven-year term loan B, which priced at Libor plus 200 basis points (bps), with a zero Libor floor and an original issue discount of 99.75.

The $21bn funding package raised in excess of $76bn in orders at the virtual roadshow, which demonstrates the enormous interest in the deal and the company, but also speaks to the maturity of the sector.

> **"It is staggering that any aviation company has been able to attract $76bn of interest. The industry has matured so much as the financial markets become more and more comfortable with aircraft as a very investible asset."**
>
> *Aengus Kelly, AerCap*

"The investor response was testament to the AerCap business model, the transaction, but also to the entire industry – it is staggering that any aviation company has been able to attract $76bn of interest. The industry has matured so much as the financial markets become more and more comfortable with aircraft as a very investible asset," says AerCap's Kelly, "particularly when it's well managed by a very competent asset manager."

Although the bulk of the funds raised were in the unsecured market, as per AerCap's wishes, the company saw massive demand for its secured debt as well – combined AerCap's fund raising attracted in excess of $85bn in demand.

The volume of debt on offer served to attract new investors into the aircraft leasing market and aviation in general. The hope is that they will stay and serve to expand the investor pool for the entire market.

"Because the deal was so big, it showed up in all of the indices and so was seen by more money managers than previous aircraft lessor deals," says one investment banker. "If you're a money manager and you didn't buy this bond and it performs well, you may underperform the market for the year simply because it was so big. A lot of accounts showed up for this deal that don't usually show up in leasing. Hopefully, the deal performs well and brings those new investors in this deal into other aircraft leasing transactions."

The unsecured corporate debt market remained wide open for aircraft lessors during the pandemic, reopened by AerCap and BOC Aviation in mid-2020, and remains very active heading into 2022. The market for investment grade rated lessors is very robust. During 2021, ALC raised more than $3.6bn in senior unsecured debt via its medium-term note programme – at incredibly low rates ($750m MTNs due 2024 issued in the first quarter of 2021 priced at a record low of 0.70%) – and has steadily increased its unsecured revolving credit facility throughout the year from $6.4bn to $6.8bn. ALC also issued its first MTN bond of the year in January 2022 raising $1.5bn with $750m 2.20% senior unsecured MTNs due 2027 and $750m 2.875% senior unsecured MTNs due 2032.

Regardless of rising interest rates and the inflationary environment, ALC's John Plueger remains confident that the capital markets will remain open and a robust source of capital going forward. "Certainly for the first quarter or two of 2022, that robust capital will still be available through the investment grade market," he says. "ALC's strategy has always been from day one to maintain strong investment grade ratings, which has served us very well during this pandemic. And during a time when others started to struggle for financing."

"If an increase in interest rates comes with inflation, those that have the highest rated balance sheets are going to still enjoy the lowest cost of debt," adds Plueger. "Generally speaking, if you look back over history, an inflationary environment tends to be good news for lessors because higher interest rates and higher inflation tends to bias a purchase decision versus a lease decision slightly in favour of leasing since capital is still scarce and the cost of money rises. I feel pretty good about the future, and we will have a very good debt capital market to support the growth in our business new aircraft deliveries for the foreseeable future."

AerCap and ALC were not alone in accessing the unsecured markets in significant ways and at very attractive rates. Investment grade lessors including DAE, SMBC Aviation Capital, BOC Aviation, Aircastle, Aviation Capital Group, and Avolon all had successful bond raises during 2021, with over $32bn being raised by lessors during 2021. The quantum raised and the interest rate spreads achieved by each of these investment grade lessors highlight both the confidence the investment community has in the leasing model and also speaks to the maturity of aviation as an investible asset class. Even as we move into to a rising interest rate environment, there is a widely held belief in the lessor community that there will be a continued ability to obtain attractive spreads on unsecured debt for large-scale, well run leasing platforms.

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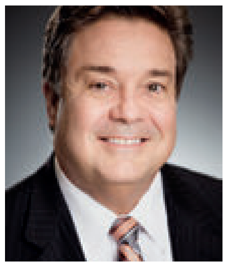
John Plueger, Air Lease Corporation



Trading returns

Lessors are frequent traders of aircraft assets – primary the larger, young portfolio-focused companies selling off older assets into the mid-life leasing sector. The COVID-19 pandemic put the brakes on aircraft sales in the early days of the crisis as aircraft were grounded. However, aircraft trading started to pick up again in early 2021.

"[The trading market] is very robust, says AerCap's Kelly. "We've seen very strong interest in assets we've been selling over the course of 2021. At the end of 2020 into the first half of 2021, buyers focused on narrowbody assets that were on long-term lease. But we are seeing that migrate as buyers realise that the aircraft leasing industry is a crucial part of the infrastructure of the airlines and because we have seen a huge fall off in deliveries of aircraft from the two OEMs. The educated buyers are certainly seeing the demand over the next several years for existing technology assets. And we're certainly seeing good pricing coming back as we look to sell assets. The market turned a bit faster than I thought; the price of assets started to rise in the second half of last year and we certainly saw significant price increases on the new tech side, and on the narrowbody demand for A320s and 737s, followed recently in the 787 and A350 market, the more desirable of widebody assets and the A330 Neo. The prices of those assets are moving upward. I'm confident that we will see a market for 777s and the A330s and as we go through this year, we'll see movement in the right direction too, because we can see what's happening on the engine side."

Engine lessor, ELF's Barrett, notes that he is very interested to find out AerCap's engine leasing strategy following its acquisition of an interest in Shannon Engine Support (SES), which leases spare engines for CFM International, through a new joint venture signed with Safran in November 2021. SES is now a 50/50 joint company between AerCap and Safran. Barrett is poised for any opportunities that may fall out of the GEEL/SES acquisition but highlights the limited numbers of dedicated engine lessors, which traditionally is a much more difficult space for new investors to enter because it requires much more technical expertise than the new aircraft leasing space. "It's unlikely there will be much M&A in the engine space," he says. "One OEM has determined to exit the engine leasing market and it remains to be seen what how other OEM/other lessors strategies will evolve."

SMBC Aviation Capital is also witnessing a very strong trading environment. "We are seeing strong bids on the trading side at the moment," says CEO Peter Barrett. "We are receiving attractive offers, particularly for younger technology aircraft, both Neos and Ceos and MAXs and NGs, which are relatively young narrowbody aircraft. We have a wide variety of buyers, not just the ABS-type of buyers, but investors generally have a strong interest in the types of aircraft that we own."

Other lessors have commented that the trading environment remains difficult in that there are many buyers seeking to purchase assets but they are simply not available – at least not at pre-COVID volumes – due to the larger lessors receiving fewer new aircraft due to production delays and deferred orders, but also because many have been reluctant to trade while asset values remain low.

"There's a general view Omicron may delay progress by a number of months, but we still take a view that we will see significantly more trading in 2022," says Seraph's CEO David Butler. "There are several lessors that have done very well from focusing on specific types of midlife assets and the opportunities there and there's also a natural attrition from the leasing platforms, which are constantly upgrading their customer base and the aircraft type to retain a young, fuel-efficient fleet. We absolutely expect to see more opportunities around the midlife space this year."

ALC's John Plueger agrees that the larger lessors will start to ramp up their trading activities this year: "The large lessors haven't taken on new aircraft at the pace they would have expected to and so haven't had to sell at the pace they would normally," he says. "That's all coming to a head in 2022. Deliveries will pick up and the large lessors will have to start selling again to start-up aircraft lessors or established midlife buyers, or they may tap the ABS market. You're probably going to see a combination of both."

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David Butler,
Seraph Aviation Capital

Lessor Financing

The larger lessors have been incredibly successful in raising funds from the capital markets and from their strong parents, which has enabled them to support their airline customers throughout the crisis. Investment grade lessors have been the most successful, raising enormous amounts of debt at historically low levels despite the ongoing pandemic crisis.

"Investment grade lessors have been relying on the unsecured debt market, and they have all taken advantage of the rate environment over the last 12 to 15 months to reset their longer-term debt," says Vinodh Srinivasan, managing director, co-head of the Structured Credit Group, Mizuho. "If interest rates start to rise, lease rates often follow with a lag. But so long as the debt maturities are still further out, the lessors will see a net benefit."

Non-investment grade asset managers too have been incredibly successful at raising funds from various sources including access to warehouse capital and the asset-backed securitisation (ABS) market for more permanent financing, which has returned to full strength much faster than anyone initially expected.

"Even in that post-COVID market, ABS deals are pricing a good 100 basis points inside of the best deals pre-COVID," says Srinivasan, "so everybody's taking advantage of the real interest rate environment."

In February 2020, aviation ABS issuance screeched to a complete halt along with the world's air traffic as governments reacted to the COVID-19 outbreak. The belief was that the market would remain shuttered for some time until the post-pandemic recovery was well underway. However, the world had barely opened up following the worst of the global lockdown period, when the ABS market woke up in early 2021 and roared back into life throughout the year, gaining in size and scale. By December 2021, annual aviation ABS issuance had reached 14 deals with a total volume in excess of $8.5bn.

The speed with which the ABS market recovered surprised almost everyone. "The ABS recovery has been much quicker than expected after having been shut down for much of 2020, so its return was really a pleasant surprise in 2021," shares Mizuho's Srinivasan, who has operated extensively in the ABS market for several years. "But if you take a big step back, perhaps it was predictable given that the Fed was pumping all that money into the sector and there is a wall of money looking for yield. Aircraft ABS deals actually provide a better yield than other ABS issuances such as auto and credit card assets. Those deals are pricing at sub-1%, with many aircraft deals pricing closer to 2.5%."

Since the first tentative ABS deals return in early 2021 with Castlelake's CLAST 2021-1 in January 2021, there have been a further 13 deals issued with the structures evolving throughout the year.

A number of structural enhancements were introduced in the immediate post-COVID period ABS transactions to provide additional protection for the debtholders who were extremely cautious in the early part of the year.

One of the foremost structural additions was the shortening of the debt service coverage ratio (DSCR) – the measurement of the available cash flow to pay current debt obligations – from six months to three months. "The DSCR becomes much more reactive to any triggers in the structure and the DSCR kicks in faster should there be any interruption to the cashflows," explains Serge Gabovich, Managing Director at Mizuho. "This was introduced post pandemic since investors felt it took too long for the DSCR to trip in previous transactions when losses began to filter through as a result of the air travel restrictions."

The sense is that this shorter DSCR is a structural change that is likely to remain even as the issuing environment continues to improve as air travel recovers to 2019 levels. "This feature has been included in almost every ABS issuance in 2021; investors like it and there is no reason to change it so it will likely remain in the ABS structure going forward," says Gabovich.

Another significant structure change has been the introduction of the minimum aircraft test. "The inclusion of the minimum aircraft test has been driven by the rating agencies and is another feature that we think is here to stay," notes Gabovich.

The test sets the minimum number of aircraft for any secured aircraft pool and once portfolio drops below a certain number, the transaction goes into full cash sweep. "This feature was introduced because as the pandemic developed, there were a number of deals where aircraft couldn't be delivered into them and the portfolios ended up with too few aircraft, which lost diversification and ultimately needed to be rapidly downgraded, even if the debtholders were repaid large chunks of their initial investment," explains Gabovich.

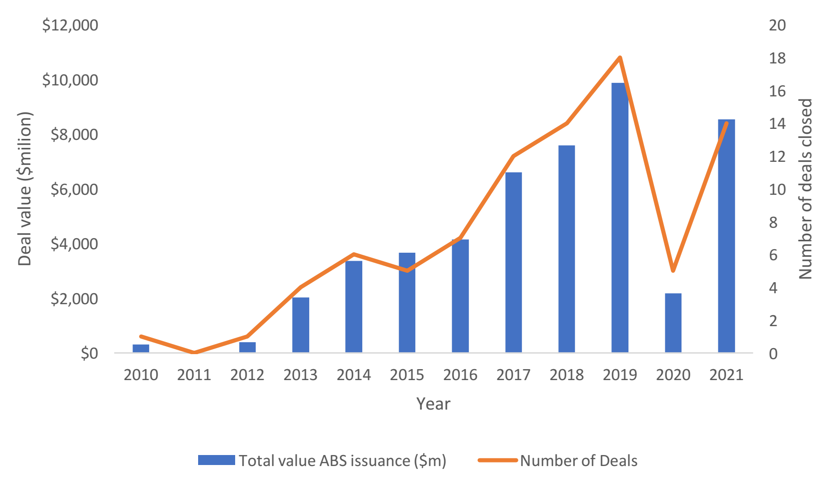
Another new feature has been the collections test, which assesses the percentage of the funds collected that would trigger certain protective features if it was too low. Gabovich doubts that this feature is here to stay since the collections test has been slowly disappearing from the latest ABS deals that have come to market.

ABS transactions have always featured a liquidity facility, typically sized around nine months of senior note interest. Post pandemic, some facilities have increased to provide coverage for up to 18 months to ensure that there is enough liquidity available in difficult situations without causing any defaults. "While this is a protective and helpful feature, we don't think that it's necessary to include such a large liquidity facility going forward and it is likely to disappear," predicts Gabovich. "Generally, for post-pandemic transactions, we have seen the cash security deposit accounts being funded with more cash than they have been prior to the pandemic," he adds. "That aspect may continue while the industry remains in recovery but it is likely to be loosened over time because this overfunding is an additional drag on capital in exchange for added peace of mind."

Another new feature has been the enhancement made to the C Note reserve account. "Prior to the pandemic, the account was typically funded once with a fixed amount to prevent the Notes from PIKing, since investors don't like Notes that are designed to PIK and not pay timely interest," says Gabovich. "The reserve was set up for this reason but in the latest wave of deals, the cash reserve also replenishes. We think that this feature may remain in the near term especially given how fundamentally the lower rated classes were impacted by the pandemic."

SKY came to market with an ABS in May, the $663m SLAM 2021-1, which consisted of two series of notes: $592.4m A notes priced at 2.434% and $70.7m of B notes priced at 3.422%. The notes were secured on a portfolio of 16 aircraft valued at approximately $885m. An affiliate of SKY acquired the E Notes of SLAM. SKY used the proceeds for the transaction to refinance its existing warehouse debt financing facility.

"We were very happy with the result," says SKY's Wiley. "We saw a very



Source: Airline Economics Research

CHART 15: AVIATION ABS DEAL VOLUME AND VALUE 2010-2021

significant demand for well-constructed portfolios in the first quarter. Post-COVID the biggest change has been that investors are differentiating on the quality of the portfolio in terms of the pricing – even when they have the same manager. That a really healthy development because it will allow for more market participants to choose what kind of risks they're willing to take within these ABS structures."

KBRA's Riggi was not too surprised that the ABS market rebounded as rapidly as it has, mainly due to the "wall of refinancing" that was due and the general importance of the market to aircraft lessors. She points to the changes in structures as a positive move for the industry and also applauds the first CLO-type ABS issuance from Stonepeak and Bellinger – SALT 2021-1 – as a positive development for the product type and the industry.

"The ABS deals that came to market had more conservative structures," she says. "There are now ABS deals secured on much younger aircraft, with much longer lease terms remaining. There are even some loan deals that are kind of like mini-CLOs structures, which are simpler. Perhaps lessons were learned from the crisis but there's still a place for older aircraft."

One aviation banker does not believe any E Note ABS deals will be sold so long as Omicron or other variants are a threat for the airline industry. "We are watching the current performance of the ABS on the sub notes, for mid-life aircraft, and power-by-the-hour agreements."

Griffin's Ryan McKenna, who helped launch the tradeable E Note ABS product while he worked with ALC, sees no problem with the product and expects it to return. "I think there are no issues with the E Note market," he says. "If there are performing portfolios, the E Note market will be ready to roll the same way as the credit side. I see no structural problems on either side; it's really a question of getting the airlines back healthy and on normal payment schedules, according to the lease documents. If you showed up to the market in January with you know, a portfolio that was performing, I think the E Note market would be ready to accept it with open arms."

Mizuho's Srinivasan agrees and maintains that the E Note market has never really closed. Srinivasan and his team recently closed the first tradeable E Note ABS transaction for the first time in some months in the shipping sector with the $275m marine container backed portfolio sale for Buss Global Management. The $85m E Note was marketed to a mix of investors including traditional E Note buyers across the aviation space. With the success of this deal and interest from aviation buyers, the Mizuho team are confident the product type will return in 2022.

Chapter III

Capitalising on Cargo

The air freight market has continued to be a major bright spot in the commercial aviation market. Fuelled by the growth of e-commerce (boosted by the necessity for online shopping during lockdowns), supply chain disruptions, and the decline in passenger flights, the demand for air cargo has risen in line with the pandemic period. The shortage of belly cargo capacity in passenger aircraft sent freight rates soaring and led to the creation of the so-called preighter aircraft as airlines tried to recoup any revenue from transporting cargo, including PPE and vaccines around the world.

The increased demand for cargo aircraft also delayed retirements of some aircraft models and encouraged lessors to convert passenger aircraft into freighters. Later in the pandemic period, supply chain delays only added to the demand for air freight.

Data from the International Air Transport Association (IATA) Air Cargo Market Analysis shows that after a strong 2017, early 2018 exhibited signs of growth softening. Later data showed that the market went from slowed growth to a continuous decline, as Cargo Tonne Kilometres (CTK) measures dropped nearly every month in the second half of 2018 and for all of 2019. While CTKs plummeted at the onset of the pandemic in March and April 2020, the cargo sector had seen a robust resurgence each month since. Monthly 2021 CTK levels were higher than those for 2019. Air cargo revenue has been crucial for all airlines with total revenues from cargo increasing to 35.0% in 2020 and 37.0% in 2021, according to IATA's Economic Outlook.

The latest monthly figures from IATA show that global demand, measured in CTKs , rose 3.7% in November 2021 compared to 2019 (4.2% for international operations). This was significantly lower than the 8.2% growth seen in October 2021 (9.2% for international operations) and in previous months. Capacity was 7.6% below November 2019 (-7.9% for international operations). This was relatively unchanged from October. Capacity remains constrained with bottlenecks at key hubs.

Despite the softening in demand, IATA maintains that economic conditions continue to support air cargo growth, even though numbers are currently impacted by supply chain disruptions.

"Air cargo growth was halved in November compared to October because of supply chain disruptions. All economic indicators pointed towards continued strong demand, but the pressures of labour shortages and constraints across the logistics system unexpectedly resulted in lost growth opportunities. Manufacturers, for example, were unable to get vital goods to where they were needed, including PPE. Governments must act quickly to relieve pressure on global supply chains before it permanently dents the shape of the economic recovery from COVID-19," said Willie Walsh, IATA's Director General.

Traditionally, the cargo market has been an extremely volatile space, easily impacted by economic shocks around the world. After two years of growth, the aviation world is desperate to know if this growth is now stable and growth will continue even as the passenger market recovers, opening up belly cargo space once more.

Some lessors are convinced that this is the case. A good example is Air Lease Corporation placing a small order for a freighter aircraft for the very first time.

"Typically the freight marketplace has fluctuated a lot more than the passenger market," says ALC's John Plueger. "The advent of e-commerce has been a great stabiliser, which is what influenced our decision to enter the freight marketplace. E-commerce is a growth engine that is here to stay, but it's also provided tremendous stabilisation in that marketplace, which wasn't there before."

Plueger expects all of the widebodies that have been grounded as capacity demand remains low – especially for international routes – to be reintegrated back into service within the next two to four years, which will provide additional freight capacity. But he still believes there is sufficient demand to warrant a separate investment in new dedicated cargo aircraft. "New aircraft is at the centre of our business model, which is why we went for the A350 freighter but that's not to say we wouldn't do some conversions. We may, but our widebodies

"Air cargo growth was halved in November compared to October because of supply chain disruptions. All economic indicators pointed towards continued strong demand, but the pressures of labour shortages and constraints across the logistics system unexpectedly resulted in lost growth opportunities."

Willie Walsh, IATA

are not that old since we have a very young fleet. So we'll see how the market develops. We have a lot of confidence in the cargo market going forward."

For ALC, the decision to enter the new freighter market was made easier since the A350F is currently the only new freighter in current production. "Although it may change if Boeing decides to go ahead with a 777X freighter, the A350F is currently the only new airplane that will meet the upcoming noise and environmental standards in 2027," explains Plueger. "The A350F checks those boxes but it also has a great payload range and some unique attributes including placing the cargo loading door behind instead of forward of the wing, which makes good sense."

The A350F is lighter than competitors thanks to its composite airframe, and is designed to carry 109 tonnes of payload and a maximum range of 8,700km.

"We think that's a good range profile," adds Plueger. "It will be lighter than the 777 and the anticipated 777X freighter but in many ways we see that positively. Our order is only for seven units, so it's a modest exploration that gives us the

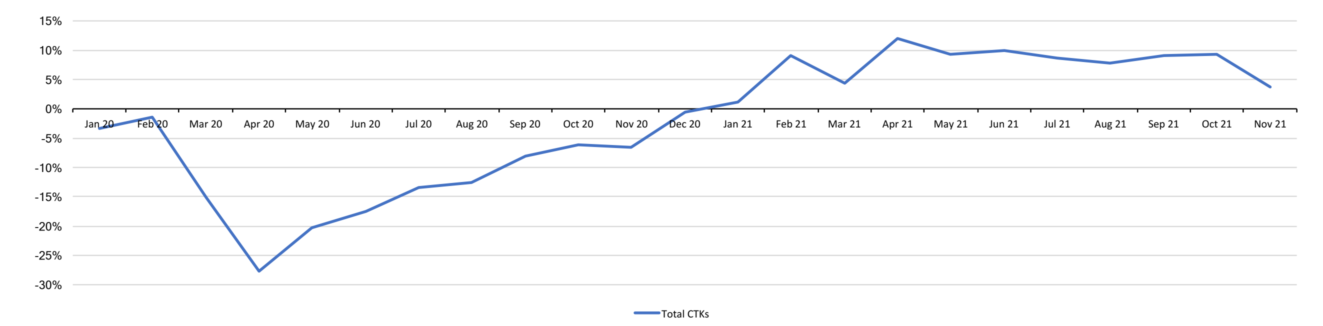


CHART 16: AIR CARGO DEMAND (JAN 2020 - NOV 2021 (% CHANGE V 2019 LEVELS)

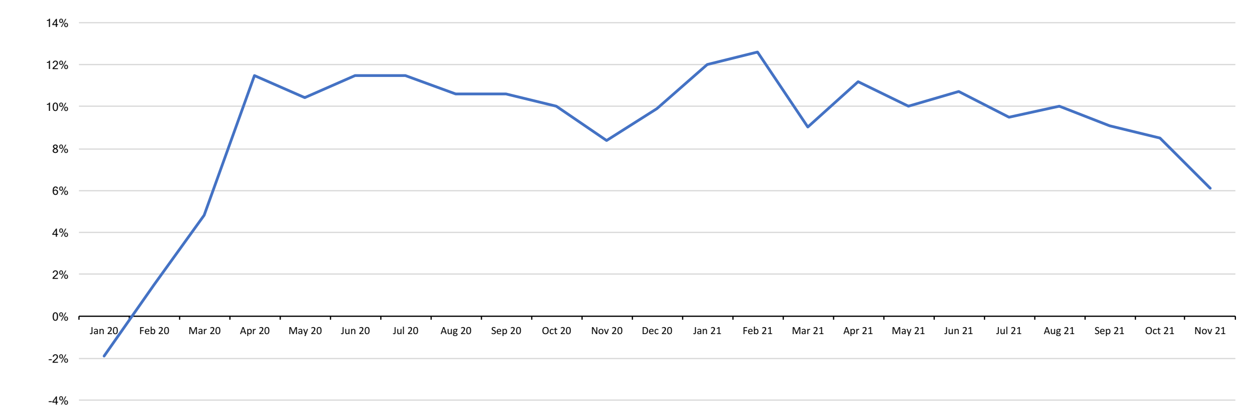


CHART 17: CARGO LOAD FACTOR, JAN 2020 - NOV 2021 (% CHANGE V 2019 LEVELS)

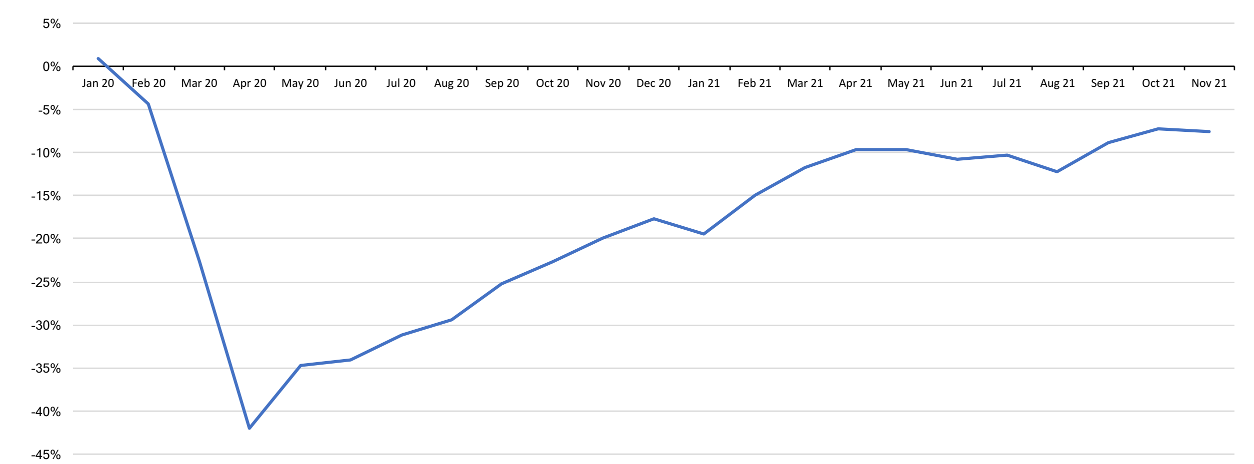


CHART 18: CARGO CAPACITY, JAN 2020 - NOV 2021 (% CHANGE V 2019 LEVELS)

chance to test our theory that this aircraft will have a great reception."

Plueger expects the main customers for this aircraft to be the larger airlines that have established cargo divisions, which he believes have the "most promise to develop, and take advantage of, the freighter marketplace over the next 10 years".

Deliveries of the A350F are scheduled for 2026, which gives ALC plenty of time to market the aircraft and cultivate the marketplace.

Boeing's Darren Hulst also believes that the growth of air cargo is sustainable but argues that yields are likely to be lower as supply chain issues are resolved. "The one thing that the industry has discovered is that people value the reliability and speed of air cargo," he says. "The global economy has fast forwarded three to four years in the shift from normal retail to e-commerce. That movement has accelerated but the demand is sustainable."

Hulst advises those airlines that have added a freight business to their passenger operations during the crisis, to implement a clear plan to embed cargo as a strategic part of their business going forward. Moving from a preighter operation to a more permanent cargo operation will not be easy due to the long lead times in acquiring the right aircraft. Cargo conversion slots are reported to be booked up for years ahead, exacerbated by the demise of some widebody aircraft, while there is also a significant backlog for OEM orders.

"There's no instant gratification," he says. "There are long lead times for dedicated freighters even though this has been a record year for Boeing in terms of the sale and production of freighters and freighter conversions. And this is a pretty complex equation. Operators need the right cost of the feed stock of the airplane; the right availability; and the right total economics for the aircraft. We have seen a lot of interest in the near term for conversion but the challenge over longer term is for operators to develop the right network, and the right operation to actually leverage that capability."

"It also needs to be sustainable over a long period of time," he adds. "The e-commerce market has proven itself to be durable, which is where the 737 BCF and the 767 conversions can really play a key role in those short and medium-haul markets where operators can build logistics networks and then scale it up to the size of these jets. But you can't just start a freighter operation. You have to know how to scale the network to actually leverage those air freight capabilities."

Atlas Air Group Worldwide is the world's largest outsourcing provider of freighter aircraft, which also owns Titan Aviation Leasing, a dedicated freighter leasing company with 35 aircraft. Michael Steen is president and Chief Executive Officer of Titan Aviation, and has had a long career in the air cargo market. Steen has seen a step change in growth trajectory of the company since the onset of the pandemic.

"In normal times, up until 2019, about 50% of global air freight transportation was shipped in passenger aircraft and the rest in freighter aircraft and it has been like that for decades, only shifting by a few percentage points up or down," shares Steen. "When the pandemic hit us in the early part of 2020 that dynamic changed completely. The industry grounded the entire Intercontinental widebody belly capacity except for the freighters, which took out a large chunk of the global capacity."

Steen expects that belly space to come back but it will take time since the international passenger demand has yet to recover substantially. The capacity constraints have been exacerbated by the supply chain issues such as low inventories, lack of raw material for production at the same time as demand has increased significantly, with e-commerce continuing to drive demand. Those factors have led e-commerce platforms to invest in their own capacity – Amazon and Alibaba are good examples and have expanded their respective dedicated freighter fleets.

From an air freight demand perspective, Steen expects to see good demand continue over the next several years, but he does expect some moderating from the peak levels seen at the height of the pandemic. Titan, which offers dry leasing services for commercial clients, has added new customers over the past few years and Steen notes that one of the trends has been non-airline demand for freighter aircraft. "The fundamentals of leasing whether you're leasing a freighter or a passenger aircraft remain the same but when we're looking at it from a freighter perspective, it is very important to understand the underlying network requirement and customer demand in order to determine the appropriate aircraft type," he says.

Titan already had a strong capital position but the renewed confidence in the air freight market has assisted the perception of the business with bank counterparties. "Historically, banks would have looked at the freighter market with a relatively narrow lens," notes Eamonn Forbes, chief commercial officer of Titan. "We have some excellent banking relationships, but there is no doubt that the phone is ringing a lot more than it used to be."

"There's obviously a great excitement around freight now, which gives us some really interesting opportunities to invest further," adds Steen.

Competition is increasing in the freighter space as many leasing companies invest in cargo conversion programmes.

In November 2020, CDB Aviation, a wholly owned Irish subsidiary of China Development Bank Financial Leasing (CDB Leasing), formed a new partnership with EFW to conduct the Passenger-to-Freighter (P2F) conversion of two Airbus A330-300 aircraft in 2021, marking the lessors first entry into freighter conversion. The two A330 P2Fs are part of CDB Aviation's existing fleet of 228 aircraft.

"We are seeing an increasing interest from our customers for medium-sized freighters, as they look to take advantage of record-high freighter utilisation, rapidly growing e-commerce demand, and higher cargo yields," said CDB Aviation chief executive officer Patrick Hannigan. "As a major lessor of passenger A330s, it is a natural evolution of our portfolio to be able to offer our customers the A330-300 P2F. Our belief is that the A330-300 P2F is the exact type of medium widebody aircraft that airlines and cargo operators require to meet cargo demand near-term and into the future."

In May 2021, CDB Aviation, announced the long-term lease of the two A330-300P2F aircraft to Mexico-based MasAir Cargo Airline (MasAir), which are due to be delivered during the first half of 2022.

Dr. Andreas Sperl, Chief Executive Officer of EFW, commented. "The A330 P2F is considered as very popular especially for the express cargo market, as it is a wide body program with great capacity offering more cargo volume and lower cost-per-ton than other available freighter aircraft types with a similar range."

In August 2021, Avolon announced a significant commitment to the global air freighter market to capitalise on the growth in e-commerce. The lessor signed an agreement with Israel Aerospace Industries (IAI), the independent freighter conversion company, to be the launch customer for IAI's Airbus A330-300 freighter conversion programme. The agreement will see Avolon partner with IAI on its STC development and take 30 A330-300 conversion slots with IAI between 2025 and 2028.

Dómhnal Slattery, Avolon CEO, commented: "We identified IAI as a long-time global leader in the aircraft conversion business and the right partner for Avolon to capitalise on the unparalleled growth in e-commerce. The global air freight market is worth over US$150 billion annually today and the sector is transforming, with air cargo traffic expected to double over the next 20 years. This agreement signals Avolon's intention to be a leading player in that expansion.

We believe the IAI A330-300 P2F will be the wide body freighter of choice this decade and beyond, replacing retiring aircraft and providing the volume capacity required to meet market needs. In partnering with IAI we have identified the most efficient operator in the freight conversion market, guaranteeing more cargo pallet capacity and crucially, faster turnaround times, in a market where every inch and second count."

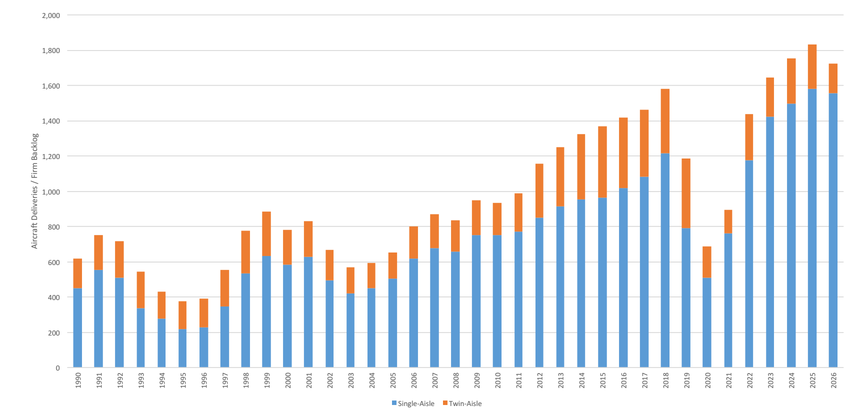
The increase in competition in the air freight market may lead to an oversupply of freighter aircraft, warns Arena Aviation Capital's den Elzen: "Many people jumped on the cargo conversion bandwagon because they saw that as the only way to avoid having to crystallise very significant losses on their investment, and book values," he says. "You can really question whether the window of opportunity has not already closed for making sense of an investment into the cargo market since there are concerns that too many aircraft are being converted and that over the long term, we may be looking at an oversupply of freight aircraft. Short term, markets are seeing lease rentals down by about 20% already relative to what they were a year ago. We see that trend continuing for a little bit longer."

"You can really question if the window of opportunity has not already closed for making sense of an investment into the cargo market since there are concerns that too many aircraft are being converted and that over the long term, we may be looking at an oversupply of freight aircraft."

Patrick den Elzen,
Arena Aviation Capital

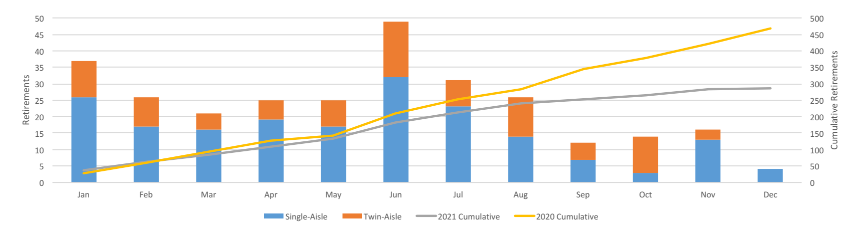
Chapter IV

Rightsizing the Fleet



Source: Ascend by Cirium

CHART 19: AIRCRAFT DELIVERIES AND FIRM BACKLOG



Source: Ascend by Cirium

CHART 20: AIRCRAFT RETIREMENTS IN 2021

New technology, fuel efficient, narrowbody aircraft continue to be the focus of demand as airlines are encouraged by shareholders, investors, governments and passengers to operate the cleanest aircraft fleet possible, as the world commits to net zero emissions. In 2020, airlines and lessors worked to defer orders while they rationalised their fleets. As confidence in air travel recovery continued to grow throughout the year, airlines became more confident in their capacity plans and 2021 marked a return to aircraft ordering from the OEMs.

Boeing's orderbook recovered strongly in 2021, aided by the successful reintroduction of its MAX aircraft to the market. Boeing's 2021 net orders, after factoring in cancellations and conversions, reached 535 (909 gross orders). Boeing delivered more than 340 aircraft to airlines in 2021, which was more than double the 157 delivered in 2020, but still far below the record of 806 aircraft deliveries in 2018.

Approximately two thirds of the aircraft sold by Boeing last year were variants of the 737MAX. Boeing booked 263 orders for its 737-family aircraft in 2021, and 77 orders for widebody aircraft: 32 767s, 24 777s, 14 787s and four 747s.

Boeing's MAX programme was boosted further in January 2022, with an order from Allegiant Air for 50 737 MAX jets – the 737-7 and 737-8-200 – with options for 50 additional airplanes. This deal was specifically important since it marks the departure of Allegiant from its current all-Airbus fleet of 108 A319 and A320s.

Maurice J. Gallagher, Jr., Allegiant chairman and CEO, commented: "While the heart of our strategy continues to centre on previously-owned aircraft, the infusion of up to 100 direct-from-the-manufacturer 737s will bring numerous benefits for the future – including flexibility for capacity growth and aircraft retirements, significant environmental benefits, and modern configuration and cabin features our customers will appreciate."

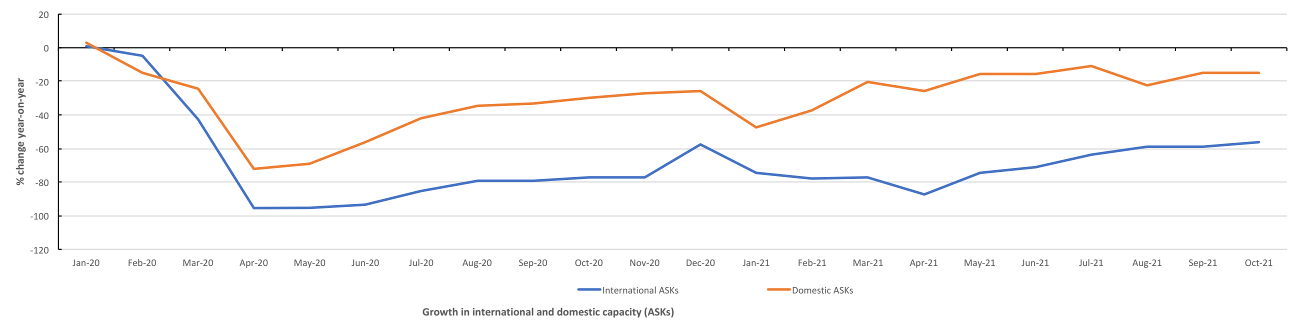
In 2021, Airbus booked 501 net orders and 771 gross, announcing that it had also reached its delivery target for the year with 611 commercial aircraft delivered to eighty customers.

"Our commercial aircraft achievements in 2021 reflect the focus and resilience of our Airbus teams, customers, suppliers and stakeholders across the globe who pulled together to deliver remarkable results. The year saw significant orders from airlines worldwide, signalling confidence in the sustainable growth of air travel post-COVID," said Guillaume Faury, Airbus Chief Executive Officer.

In 2021, Airbus delivered 483 A320-family aircraft, 55 A350-family aircraft, 50 A220-family aircraft, 18 A330-family aircraft and five A380s. During last year, the airframe manufacturer doubled its gross order intake compared to 2020 with 771 new sales (507 net). The A220 won 64 firm gross new orders and several high profile commitments. The A320neo family won 661 gross new orders. In the widebody segment, Airbus won 46 gross new orders including 30 A330s and 16 A350s of which 11 were for the

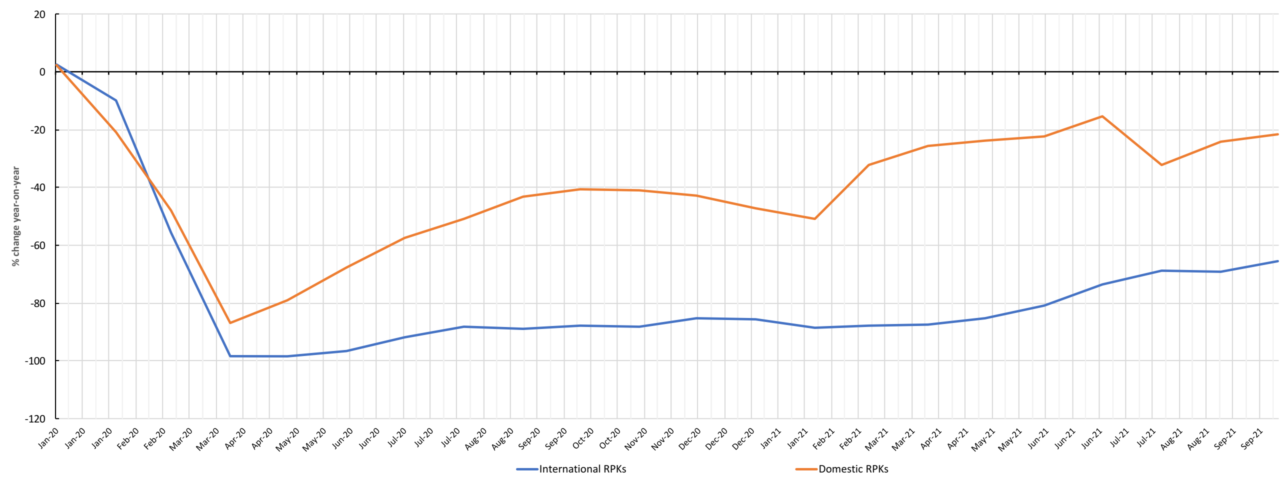
"Airlines are no longer willing to take a bet on a huge airplane that can only serve a small subset of a network or a small aircraft that can't scale in terms of cost per seat or other attributes for a network."

Darren Hulst, Boeing



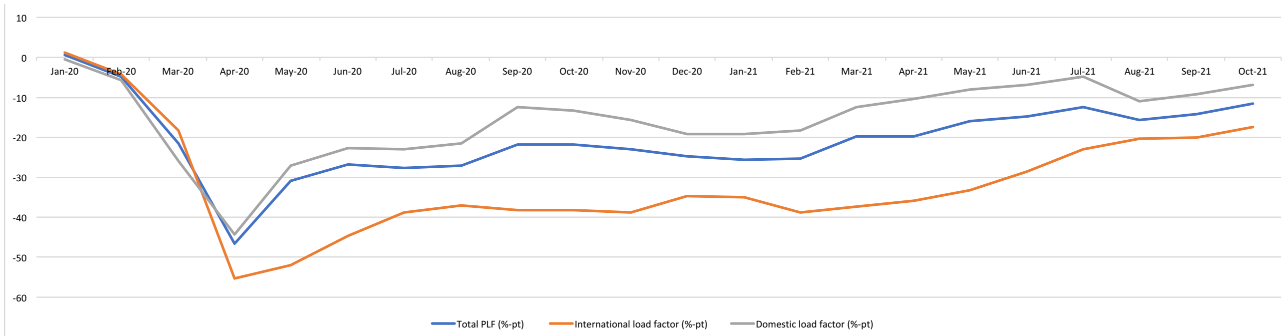
Source: IATA, Airline Economics Research

CHART 21: AIRLINE CAPACITY GROWTH (ASKS, JAN 2020 – OCT 2021)



Source: IATA, Airline Economics Research

CHART 22: AIRLINE TRAVEL GROWTH (RPKS, JAN 2020 – OCT 2021)



Source: IATA, Airline Economics Research

CHART 23: PASSENGER LOAD FACTOR TRENDS (% CHANGE V 2019 LEVELS)

newly launched A350F, which gained an additional 11 commitments.

Airbus is particularly proud of its A321 aircraft programme, with demand exceeding even the manufacturer's expectations: "We see extremely strong demand for our A321 family, more than we anticipated the, while the A220 is gaining a lot of very good traction," says Paul Meijers, EVP – commercial aircraft leasing, trading & finance at Airbus.

Freighter orders were a particular feature of 2021 as cargo conversion slots dried up, freighter lessor and operators have been obliged to make direct OEM orders to ensure access to more lift as cargo demand remains high. Boeing sold 80 freighters in 2021 – 19 767-300Fs, 19 767-300Fs, 38 777Fs, and four 747s.

Airbus began its marketing push for its A350F in 2021, with ALC becoming the launch company with an order for seven units. CMA CGM Group signed an MOU for four, while SIA signed a LOI for seven.

"Unless there is a significant return of international business travel, current technology or more likely new technology narrowbody aircraft will remain in favour, at least in the short term. When it does come back on stream, the climate change focus will also continue to push airlines to operate more fuel efficient widebody aircraft, notes Fitch Ratings' Johann Juan.

"We have certainly seen a significant decline in metal values for A330s, particularly the -300ER and -200LR aircraft types that are less in favour in this economic environment, which has been reflected in depressed lease rates and metal values," he says.

Airbus believes deeply in the A330neo programme. "A lot of people were questioning the A330neo programme two years ago, but we strongly believe it is going to be do very well. The aircraft is excellent in terms of its performance capabilities, economics, and range, and is also priced at an attractive capital cost versus other widebodies."

Meijers acknowledges the demand for mid-life aircraft due to the shortage of new technology aircraft, and equally believes that the widebody aircraft demand will return for used aircraft, especially when South East Asia countries recover.

"When South East Asia recovers and borders reopen, we will see a recovery in the demand for widebodies in general, including used aircraft," he adds. "Those aircraft provide very good value at attractive lease rents and airlines will probably pick up on these opportunities with leasing companies in the market."

For Boeing's Darren Hulst, the key to fleet decisions in this environment is versatility: "The industry wants the capability and efficiency of new technology at the lowest risk," he says. "Airlines are no longer willing to take a bet on a huge airplane that can only serve a small subset of a network or a small aircraft that can't scale in terms of cost per seat or other attributes for a network. That's why over the long term, or even over the next few years, we're going to see a widebody movement towards the versatility of an aircraft like the 787 that can fly pretty much anywhere with the lowest trip and seat cost."

"In the single aisle space, new technology is important and a focus of where our demand is, but there is still that need to balance between the cost per trip and the cost per seat as the industry prepares to compete in a market that features more and more low-cost players," adds Hulst.

As the aviation market inches its way out of the downturn, the airframe manufacturers are beginning to look to ramp up production levels to meet demand.

"While uncertainties remain, we are on track to lift production through 2022 to meet our customers' requirements," said Faury in January 2022.

Meijers confirms that Airbus is increasing production on all aircraft programmes, but with a focus on single aisle types. "We will get back to 65 aircraft per month by summer 2023 on single aisle aircraft, we only paused A220 production, which has now resumed. We did a small adjustment to the widebody production rates – the A330 will increase from two to three a month – and only small upward adjustment on the A350 programme because the market isn't yet fully recovered."

For both manufacturers ramping up productions rates needs to be a staged approach due to the problems experienced by their third-party suppliers. "It is extremely challenging from a logistics perspective - re-hiring people, lining up suppliers, for this quick turnaround in the single aisle production." says Meijer. "The key objective for 2022 is to actively manage this ramp up to serve our customers and meet our contractual commitments. They expect their aircraft on time, and that's what we're working towards."

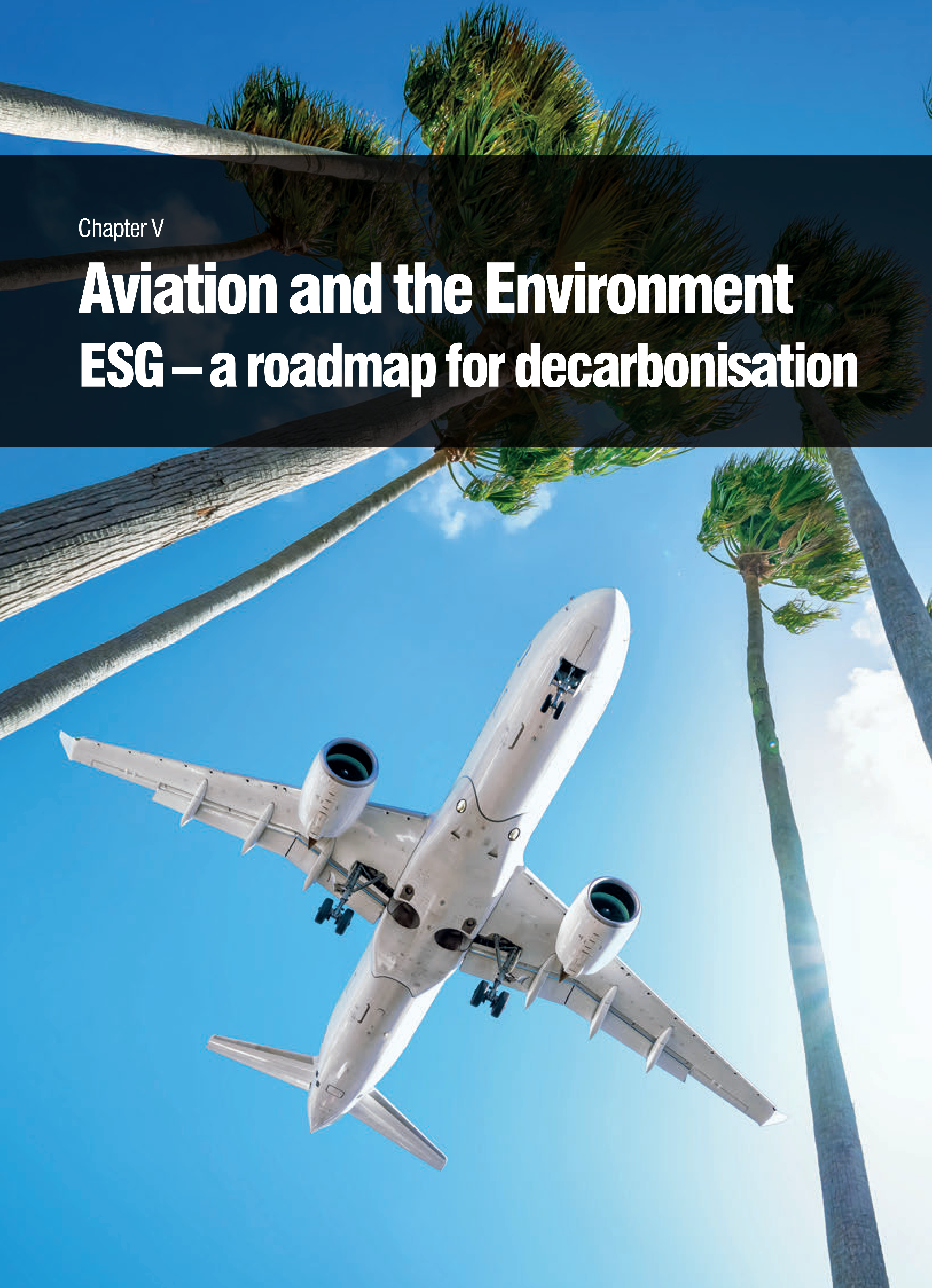
"When South East Asia recovers and borders reopen, we will see a recovery in the demand for widebodies in general, including used aircraft. Those aircraft provide very good value at attractive lease rents and airlines will probably pick up on these opportunities with leasing companies in the market."

Paul Mijers, Airbus

Chapter V

Aviation and the Environment

ESG – a roadmap for decarbonisation



At the same time as ramping up production of its existing aircraft products, Airbus and Boeing have been preparing the future of aviation, and implementing a roadmap for decarbonisation.

Aviation's role in the climate change debate has changed significantly over the past few years. The COVID-19 pandemic grounded flights and halted air travel, reversing the runaway growth that the industry had enjoyed for the past decade. Although the crisis in the early days pushed environmental issues to one side while airlines and lessors dealt with more immediate threats of business continuity and survival, the lengthy interruption later provided a perfect opportunity for the world to embark on a "build back better" programme with baked-in sustainability goals for a renewed global economy. Airlines have steadily bought into the net zero pledge, which culminated in the IATA AGM resolution for the global air transport industry to achieve net-zero carbon emissions by 2050, aligning the industry with the 2015 Paris Agreement goal for global warming not to exceed 1.5°C.

Achieving net zero emissions is an enormous challenge for any carbon-emitting industry, but the aviation industry must progressively reduce its emissions while accommodating the growing demand of a world eager to fly. Many airlines have pledged to become net zero in line with the IATA resolution, with the larger companies pouring resources into new technology aircraft and greener infrastructure as well as stepping up efforts to transition to use more sustainable aviation fuel (SAF) and carbon offsets.

Currently, the aviation industry is pursuing four levers in its goal for net zero emissions for 2050: improving energy efficiency, using sustainable aviation fuel, developing alternative technologies, and utilising carbon offsets. The vast majority of airline scope 1 emissions are tied to jet fuel combustion, which means efforts are being focused on upgrading fleets to the most fuel-efficient new technology aircraft and transitioning to the full use of sustainable aviation fuel.

Jan Melgaard, executive chairman of FPG Amentum, strenuously defends the ambitious targets set by the industry. "We need to get to net zero by 2050; it's basically our industry's license to operate."

Although aviation is a small contributor to overall emissions, the industry is large and growing and very visible. The real fear is that if the aviation industry doesn't take a lead in reducing its emissions, governments will.

"If the airline industry doesn't take the lead on this, governments will, and we are probably not going to like what is done and what is required of the industry," warns Becker. "It's going to cost a lot of money and it's probably not going accomplish a lot."

Airlines in general have always worked to improve their energy efficiency in a bid to control costs – newer more efficient aircraft use less fuel and require less maintenance. Although airlines will continue to improve that energy efficiency, controlling operational efficiency is out of their control.

The aircraft leasing industry is also taking a lead on this. In January 2020, Aircraft Leasing Ireland (ALI), the Ibec group that represents the aircraft leasing sector in Ireland, launched an ESG narrative, "Aviation Sustainability: Our Future", which outlines the aviation industry's pathway to decarbonisation, noting the steps that the industry is committing itself to and has already begun to embrace to support its ambitions of achieving net zero carbon emissions by 2050.

"We will improve our operational efficiency and become better at flying in more straight lines from A to B today," says Melgaard. "We have some unfortunate situations where we end up flying longer routes than necessary, which will undoubtedly disappear, but it will still take a little bit of time. The biggest component has to be sustainable aviation fuel."

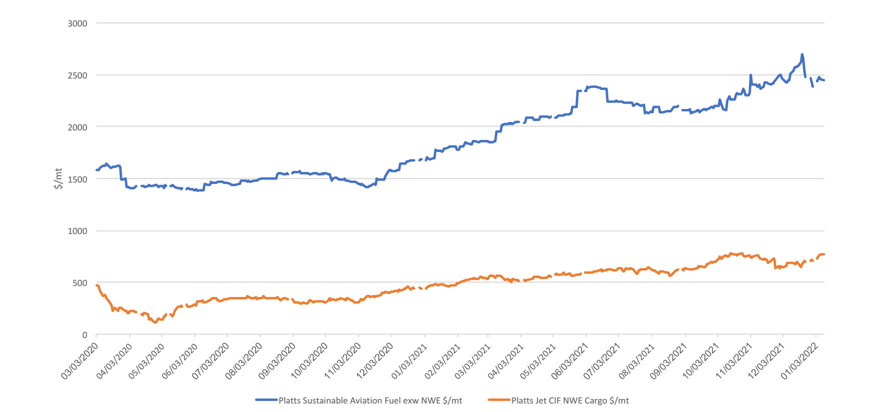
"Every airline that we speak to are investing in SAF," says Becker. "The two elements that can quickly lower emissions are improving air traffic control with more direct routing; and the use of sustainable aviation fuel."

President Biden's announcement in September 2021 with the goal of replacing all jet fuel with SAF by 2050 was welcomed by the industry but also brought into sharp focus the enormous challenge of meeting such an ambitious goal.

"If the airline industry doesn't take the lead on this [carbon emissions reduction], governments will, and we are probably not going to like what is done and what is required of the industry. It's going to cost a lot of money and it's probably not going accomplish a lot."

Helane Becker, Cowen & Company

Sustainable Aviation Fuel



The SAF assessment is a cost-based calculation using feedstocks, production costs and by-products to determine a price level.

CHART 24: SAF PRICING TRENDS (COMPARED TO JET FUEL CIF NORTHWEST EUROPE)

Source: S&P Global Platts

Depending on the production pathway and the feedstock used, SAF can produce approximately 80% fewer CO2 emissions than conventional jet fuel on a lifecycle basis, but emissions reduction depends on the production pathway and the feedstock used. CO2 emissions reductions from SAF use come from feedstock production and fuel conversion, not from fuel combustion. SAF is designed to have very similar properties to fossil fuel, burns the same way, and emits a similar amount of CO2 (3.16 kg of CO2 per kg of jet fuel).

All Airbus aircraft are currently certified to fly using 50% SAF mixed with kerosene, and an Airbus-led project in collaboration with Rolls-Royce is testing the emissions performance of 100% SAF use. Boeing has committed that its commercial airplanes will be certified to fly on 100% SAF by 2030.

Besides CO2 emissions, other pollutants such as nitrogen oxides (NOX), sulphur oxides (SOX), soot particles, and water vapours pose environmental challenges. SAF has been shown to burn cleaner than fossil fuels, thus contributing to reducing non-CO2 emissions.

There are two main types of SAF: biofuels and e-fuels. Both can be used as "drop-in", mixed with Jet A-1 fuel without the need to modify the aircraft design or the supply infrastructure.

The European sustainable aviation fuel (SAF) is expected to be one of the fastest growing segments in biofuels in 2022, alongside hydrotreated vegetable oil (HVO), or renewable diesel, according to S&P Global Platts Analytics.

The European Union (EU) ReFuelEU Aviation proposal was published in 2021, a draft regulation targeting airlines, fuel suppliers and airports, which would apply EU-wide harmonised rules for SAF, binding in full on all member states. The proposed regulation would apply to all flights leaving EU airports. Under the proposals, fuel suppliers are required to include SAF in aviation fuel supplied at EU airports; aircraft operators are required to uplift SAF-blended aviation fuel when departing from EU airports; and airports are required to provide the necessary infrastructure for storage and blending of SAF to allow fuel suppliers and aircraft operators to meet their obligations.

The central pillar of the rules requires fuel suppliers to include increasing proportions of SAF into jet fuel with a separate minimum for e-kerosene (the aviation category of e-fuels) from 2030. The proposal promotes advanced biofuels and synthetic fuels produced from green electricity.

The ReFuelEU Aviation package proposes a 2% blending mandate for EU fuel suppliers by 2025, 5% by 2030 and 63% by 2050 to target net-zero emissions in the aviation sector by 2050. S&P Global Platts Analytics believes these targets are likely to trigger mandates implemented at a national level in 2022, following the lead of Scandinavia and France, leading to concerns whether there will be sufficient supply to meet demand. As it stands, Norway and Sweden are the only European countries to have a SAF mandate, both at 1%. France has announced it is imposing a 1% blending mandate in 2022.

George Duke, Associate Editor, EMEA Biodiesel Pricing, S&P Global Platts, states: "Market participants are expecting supplies to increase with the addition of new facilities in Europe, but not sufficiently to converge sustainable aviation fuel prices with conventional A1 jet fuel prices, with current SAF price levels four times higher than their fossil fuel alternative."

The main challenges to a greater use of SAF in the aviation industry is the current low level of production, energy and deforestation concerns from the production and use of biofuels, and the cost. Governments are starting to put in place subsidies and incentives to increase the rate and volume of production, and airlines are also stimulating more demand by directly investing in SAF producers. But despite recent efforts, aviation leaders don't think enough has yet be done to make the use of SAF economically viable for airlines and to facilitate the increase in commercial capacity needed to meet future demand.

"There has to be an investment in the technology to bring down the cost of SAF, which is a multiple of what Jet 1A costs," says AerCap's Kelly. "Unless we invest heavily as a global effort, which will be very significant amount, SAF will continue to be a margin product."

Kelly also has concerns about regulations mandating the use of SAF and creating an unlevel playing field for certain airlines. "This cannot be done on a regional basis," he says. "You can't say to airlines in Europe, for example, that they have to fly 50% SAF when other airlines in the world don't have that obligation, those airlines will be at a huge disadvantage. The governments of Europe would have to subsidise those airlines, which is never a good thing. It is much better to tackle the root cause and accept the inconvenient truth that the world is powered by oil and gas. If we want that to change, then we have to invest significantly in new technologies."

Sustainable finance

The investor-led initiative, Climate Action 100+, which was formed in the wake of the 2015 Paris Agreement to help carbon-emitting companies they invest in plot a course to reduce emissions and encourage greater disclosure of climate change risks, published specific recommendations for the aviation industry that investors expect in January 2021. Foremost were aviation companies' explicit commitment to achieving net zero by 2050, adopting SAFs, along with the implementation of a strong sustainability governance framework, and the disclosure of robust Paris Agreement-aligned transition plans in line with the Task Force on Climate related Financial Disclosures (TCFD).

The 26th UN Climate Change Conference of the Parties (COP26) held in Glasgow in November 2021 accelerated the efforts of corporations, investors and regulators to encourage real climate-related change.

Investors and banks are already asking about issuers' ESG scores, but it has not quite yet reached the point where certain investors refuse to participate in funding for aviation companies due to their inadequate green credentials. However, this may be only a matter of time since banks and helicopter lessors have reported that funding oil and gas industry-related companies, including helicopters that serve oil rigs for example, is becoming much more difficult.

"A lot of our clients ask us about ESG," says Cowen's Helane Becker. "We include an ESG score on every report we issue. I feel like investors are starting to be measured on it. We're not hearing investors say that they are not investing in the airline industry because of their carbon footprint. I haven't heard that yet. Maybe that's coming. Airlines haven't been stymied in terms of raising capital due to ESG concerns, but potentially it's coming."

Becker surmises that this may be a consequence of the sheer amount of capital that's out there. "If that tightens, people will be a bit more conscientious about where they put their cash, and aviation is going to be challenged. It's never going to be a green investment. You can buy all the new technology aircraft you want, it's not going to solve your problem," she says.

The greening of the financial system has already begun with many banks having ESG policies in place when considering investments. Aviation has already begun to test sustainability-linked financing methods.

The "green finance" term covers a broad church in terms of products. Today, sustainable finance from a debt perspective is split into two types of products: use of proceeds instruments, such as green bonds and loans, and sustainability-linked instruments, which can be bonds or loans.

Green bonds are products where the proceeds raised are demonstrated as being used for green projects, such as renewable energy and energy efficiency projects, which aids decarbonisation.

Sustainability-linked loans or bonds are not concerned specifically with how the money is being spent, the loan or bond pricing is linked to the overall performance of the company on specific ESG performance indicators.

Sustainability-linked loans or bonds are based on the borrower's sustainability performance, which is measured using predefined sustainability performance targets (SPTs), that are measured by predefined key performance indicators (KPIs). The KPIs have to be meaningful, verifiable and quantifiable. Examples on the environmental side, can be as simple as meeting reductions in CO2 emissions by certain target dates. The SPTs also need be ambitious, quantitative and measurable on an annual basis, and which are consistent with the issuers' overall sustainability objectives.

Borrowers must obtain independent and external verification of its performance level against each SPT for each KPI – this is mandatory for compliance with the Sustainability Linked Loan Principles (SLLP), which were developed by a working party, consisting of representatives from leading financial institutions active in the global syndicated loan markets. Well-known ESG ratings analytics companies include: Vigeo Eiris, a

Paris-based sustainability research group that was recently acquired by Moody's; Sustainanalytics, an independent ESG and corporate governance research, ratings and analytics firm; Standard & Poor's; ISS ESG; MSCI; and ecovadis, with many more coming online.

If the company meets its targets it can gain a discount on the interest rate for the sustainability-linked loan; likewise, if it doesn't meet those targets and actually emits more, it is subject to a financial penalty.

As these products are highly bespoke, sustainability-linked loans can feature a variety of covenants. These can range from only incorporating incentives for price cuts when targets, are met or exceeded, to only incorporating penalties for failing to meet targets or both incentives and penalties. Sustainability-linked bonds closed to date are almost all penalty based for missing targets, which is consistent with their development by investors rather than commercial banks since they are not willing to receive a lower coupon if the issuer meets its targets, whereas banks have been willing to offer interest rate cuts as incentives. Although sustainability-linked loans performance targets are reviewed annually, sustainability-linked bonds have been structured in various ways. For example, a ten-year bond may have a coupon step-up through its lifecycle if a target is not met, or it may incorporate a larger one-time premium upon maturity.

The potential market for sustainability-linked loans and bonds for aviation is certainly there but it is limited. The industry is now exploring transition bonds and loans that are being specifically developed for carbon emitting industries, such as aviation. Transition bonds are essential "use of proceeds" structures where the proceeds have to demonstrably contribute to the issuer's decarbonisation targets.

Having raised $21bn in the capital markets, AerCap's Kelly has spoken with hundreds of investors recently and confirms that the subject of ESG came up in every one of those conversations, "as we knew it would". AerCap is the only lessor that has an ESG rating, which was recently upgraded by MSCI, a Board-level ESG Committee and has had ESG targets in place for many years. "This is a very important matter," stresses Kelly, noting that AerCap's ESG rating and targets were in the roadshow presentation for its recent bond offering. Kelly believes that the industry could benefit from green bonds, and notes that ESG funds are the fastest growing funds in the investment industry. "You have to be very cognizant of that fact and it is a trend that will continue. I think green bonds will be an opportunity for the industry going forward."

Over the past few years, sustainable finance deals in the aviation sector have been relatively few and far between but they have increased in recent years. In July 2021, British Airways (BA) made history raising $785m with the first enhanced equipment trust certificate (EETC) transaction linked to the airline's sustainability targets. Proceeds from the two tranches of notes were secured on BA's remaining fleet deliveries for 2021 of three A320neos, three 787-10s and one A350-1000. The sustainability feature states that if the average carbon emissions per passenger kilometre for BA is not below a specified level for the financial year ending December 31, 2025, the interest rates on the certificates will increase by 25 basis points. The target contemplates a reduction of 8.1% in this metric versus its level in 2019.

Sustainability-linked financing is also not just the preserve of banks. Crianza Aviation – the aircraft leasing company created in 2016 with the express aim of becoming a leasing entity in Korea for the Korean market – made headlines in late 2021 with the announcement that it had successfully arranged the world's first sustainability linked operating leases with a global airline, in relation to Boeing 787 and Airbus A350 aircraft.

Although sustainability-linked aviation finance deals have been closed and are becoming more popular as the industry's sustainability efforts improve, to date this is the first known operating lease to be linked to an airline's ESG performance.

The operating lease – signed with the unnamed airline earlier in 2021 – include a two-way step-up / step-down pricing mechanism, to incentivise improvements in the airline's ESG performance and demonstrate commitment to its sustainability strategy. Banco Santander acted as the ESG Structurer on the deal.

"We need to get to net zero by 2050; it's basically our industry's license to operate... We will improve our operational efficiency and become better at flying in more straight lines from A to B today... but it will still take a little bit of time. The biggest component has to be sustainable aviation fuel."

Jan Melgaard, FPG Amentum

Investing in the Future

The OEMs are expending a great deal of resources working on the future generation aircraft, which will require a dramatic leap in terms of technology to meet the net zero carbon emissions target. Airbus has set a target to fly a hydrogen-powered aircraft by 2035. "That is extremely ambitious because 2035 in our long cycle space is very challenging and it requires disruptive technologies, which are not yet transferable into the air because of some of the laws of physics," says Airbus' Meijers. "We have huge challenges to bring this together, but we have seen a lot of movement over the last year to drive sustainability."

Airbus has created a new ESG fund initiative jointly with Air Lease Corporation. The aim of the multi-million-dollar ESG fund initiative is to contribute towards investment into sustainable aviation development projects, which will also be opened to multiple stakeholders in the future from the aircraft leasing and financing community and beyond.

ALC has been looking intensely at the environmental dilemma facing the industry for the past few years but as a leasing company felt that its practical talents were limited, which is why partnering with an OEM made such sense.

"As a leasing company, we don't have the engineering and technical capabilities to substantially change the aviation industry and although we have as many ideas as the next person, the ability to partner with an OEM who actually has the capability to put those ideas into action and which has significant global influence made perfect sense," says Plueger.

Although few details have been shared publicly about the ESG fund, it is clear that it is a multi-million dollar fund that is growing, with a remit to invest in sustainable projects. Its initial focus will be assisting with enhancing the use of sustainable aviation fuels going forward. "Sustainable aviation fuel provides the most immediate and obvious benefit for the aviation industry, our fund could be used to enhance production and distribution," notes Plueger. "Beyond that, Airbus has already been doing quite a bit of advanced work on a number of other platforms, such as hydrogen and electric propulsion and other sorts of combination propulsions. It's the airframer that has to actually produce these aircraft and bring them to the market. Partnering up with some smaller start-ups, which produce smaller airplanes is great for some companies, but our role lies more with the larger commercial aircraft. Therefore it made a lot more sense for us to partner with an OEM, Airbus, that has really been devoting a tremendous amount of time and work in this area and which is the most likely path towards being able to accelerate some of these initiatives into the mainline marketplace and into the larger aircraft types. It may take longer for alternatives, but certainly initially looking at pushing sustainable aviation fuels as the next easiest step that can be adopted today."

The fund is very much still in the development phase but the idea is for ALC and Airbus to work collaboratively with others in this space and eventually open the fund to other buyers, to other lessors and even to other airlines. As Meijers says, "everybody needs to participate... and now is the time to take action".

Aviation industry leaders are sceptical of Airbus reaching its goal of developing a hydrogen commercial airliner by 2035, and even if they succeed, the certification process would take years, and it would take several more years ramping up the infrastructure to enable a marketplace launch.

Airlines are taking notice, however. In December 2021, United Airlines took a new equity stake in ZeroAvia, which is focused on hydrogen-electric aviation solutions. United expects to buy up to 100 of the company's new zero-emission, 100% hydrogen-electric engines (ZA2000-RJ).

The airline commented at the time that the engine could be retrofitted to existing United Express aircraft as early as 2028. One potential use is on United's 50-seat CRJ-550.

"Hydrogen-electric engines are one of the most promising paths to zero-emission air travel for smaller aircraft, and this investment will keep United out in front on this important emerging technology," said Scott Kirby, CEO of United. "United continues to look for opportunities to not only advance our own sustainability initiatives but also identify and help technologies and solutions that the entire industry can adopt."

The ZA2000-RJ is expected to be used in pairs as a new power source for existing regional aircraft. Under the agreement with United Airlines Ventures, United will pursue a conditional purchase agreement for 50 ZeroAvia ZA2000-RJ engines, with an option for 50 more, enough for up to 50 twin-engine aircraft which would be operated by United Express partners once they are fully developed and certified by regulators as soon as 2028.

ZeroAvia is accelerating development of its ZA2000 engine and will soon begin ground tests of its ZA600 in a 19-seat aircraft, with the aim of entering commercial service with this smaller engine by 2024. ZeroAvia's roadmap calls for it to develop hydrogen-electric propulsion for progressively larger aircraft.

Some airlines and lessors are betting on the development of Electric Vertical Take-Off and Landing (eVTOL) aircraft. These lightweight aircraft, powered by electric motors, are usually small, seating only four to six passengers; as a result, they are not considered seriously by many to be solution for commercial airlines. However, several airlines and leasing companies have placed orders for these aircraft betting on their use as regional feeder aircraft as well as their proposed replacement for land travel as so-called air taxis, as well as small cargo carriers to access hard-to-reach destinations.

In June 10, 2021, Vertical Aerospace's VA-X4 project gained orders from leading airlines and lessors that placed conditional pre-order for 1,000 aircraft for a total of up to $4bn.

The VA-X4 is a zero-carbon aircraft, capable of carrying four passengers and a pilot, that can fly at speeds up to 200 mph over a range of over 100 miles. It is claimed to be near silent when in flight, produces zero emissions and features a low cost per passenger mile.

American Airlines agreed to pre-order up to 250 aircraft with options on an additional 100 aircraft. Avolon pre-ordered up to 310 aircraft with options for a further 190, and Virgin Atlantic has an option to purchase between 50 and 150 aircraft. All have agreed to work together towards the "prompt certification and deployment of aircraft in commercial operations".

In the US, American Airlines expects to work with Vertical Aerospace on passenger operations and infrastructure development. In the UK, Virgin Atlantic and Vertical expect to work together to explore the joint venture launch of a Virgin Atlantic branded short haul eVTOL network, including operations and infrastructure development.

In 2021 Avolon announced that it has placed 70% (or 350 units) of the VX4 eVTOL order, with GOL and Japan Airlines.

"2021 saw Avolon make its landmark investment in zero-emissions aircraft," said Dómhnal Slattery, CEO of Avolon. "Both our investment in, and our orderbook with, Vertical Aerospace – which successfully listed on the New York Stock Exchange in December – will prove to be a game-changer. eVTOLs are the first step towards a revolution in air travel and the strong demand for our VX4 orderbook from the world's leading airlines shows that our airline partners share this view. We look forward to continuing to work with our customers to decarbonise air travel and work towards a net zero carbon economy."

United Airlines Ventures (UAV) – the corporate venture fund set up in 2020 to allow the airline to invest in sustainability concepts – with Breakthrough Energy Ventures (BEV) and Mesa Airlines, inked an investment with electric aircraft start-up Heart Aerospace in July 2021. United Airlines also backed the company with a conditional order for 100 ES-19 aircraft. Mesa Airlines, United's key strategic partner in bringing electric aircraft into commercial service, also agreed to add 100 ES-19 aircraft to its fleet, subject to similar requirements.

In December 2020, the US-based aircraft lessor Azorra signed a Letter of Intent (LOI) to order up to 200 of Eve's eVTOL aircraft. SkyWest also announced a Memorandum of Understanding and non-binding Letter of Intent for SkyWest to purchase 100 of Eve's eVTOL aircraft. The partnership will focus on developing a network of deployment throughout the United States.

In addition to SkyWest's LOI for 100 aircraft, both companies have agreed to form a working group to jointly evaluate the utilization of Eve's next generation air traffic management and fleet operating solutions as the Urban Air Mobility industry prepares to scale over the next decade.

Despite these industry endorsements with hundreds of orders for concept aircraft, some industry observers remain more sceptical. Cowen's Helane Becker sees eVTOL aircraft and replacements for ground transportation rather than air travel: "eVTOLS are basically four passenger aircraft with one pilot, which are flying from a downtown area to an airport or vice versa, or from your home to your office – these are not great distances. These aircraft will not replace A320s between London and Paris or between New York and Chicago. That's just not here yet and it's probably not going to be here for a decade." She is more supportive of a hydrogen-powered solution for commercial airliners but recognises the limitations there despite the fact that United Airlines has recently invested in ZeroAvia to support the development of its whole hydrogen powered aircraft. "This innovation has to come from the manufacturers and from the airlines," she says. "It's kind of a push and pull. We want it, we'll take it, you develop it, we'll buy it."

Although Becker admits that the eVTOLS will eventually replace some air services, especially the larger versions of up to 19 seats, she maintains that these aircraft will replace ground transportation rather than aircraft in the near term. "Longer term we could see development of larger aircraft," she says. "We view this decade as one of development; the 2030s will be innovation and refinement and the 2040s will be implementation.".

The good news is the amount of new technology in development, which is incredibly well financed. With so much will and money behind these projects, their prospects for success are as good as they can be. Once the programmes are more developed and there have been successful tests, there will likely be consolidation in this market that will in turn create larger scale and more momentum to the development of alternative, zero carbon aircraft.

Final Thoughts

Overall, the industry outlook is cautiously optimistic. The last two years have been the most challenging time that aviation has ever faced, but the resilience of the entire sector has been remarkable.

The widely-held belief is that the worst of this crisis is behind us, and that a globalised vaccine rollout, coupled with a coordinated international effort in managing restrictions, will drive a recovery towards 2019 air travel levels.

Over the course of 2021, we have seen that the appetite of human race to take to the skies is undiminished. The question is when, not if, a full recovery will take place.

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