

WIZARD WISDOM NEWSLETTER

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THE RISE OF LOW-COST CARRIERS: EMPOWERING SUCCESS WITH A DIGITAL TRANSFORMATION

**SOURCE: KEVIN TIERNEY – CONNECTED
AVIATION TODAY**

Following the significant decrease in air travel as a result of the COVID-19 pandemic, many in the industry wondered what the road to recovery would look like. While there is still a long way to go, recent innovations have allowed airlines and airports to create safer, cleaner environments ready for the return of travelers. In the midst of all this change, low-cost carriers have emerged and have adapted to the new normal exceptionally well. Low-cost carriers (LCCs), simply put, provide a low-cost option for air travelers. Lower costs in any business typically require cost-saving somewhere in the operational pipeline, which is passed down as a discount to the passenger. The recent success of these LCCs comes from the ongoing digital transformation innovations within airlines and airports. This transformation has brought lower costs as more physical infrastructures can be replaced with cloud-based systems. In this latest roundup, Connected Aviation Today compiled some of the most compelling stories about the LCCs successes on the road to recovery:

S&P Global reported on the unique success of low-cost carriers, noting that these “no-frill airlines cut costs quickly,” and they “absorbed pent-up demand” for air travel. This success comes from these airlines’ ability to bring already low costs lower, allowing “cash-strapped consumers” to feel comfortable flying for leisure. According to the report created by GlobalData, this success is in large part due to a decrease in operating costs. Operations can add considerable amounts to an airline’s expenses, especially if most of the equipment required to run an airline is stored physically and occupying space. The advent of the connected airport powered by cloud-based solutions has presented many new opportunities for airlines to further bring down their COSTS.

SUDBURY AIRPORT CEO REFLECTS ON A TOUGH YEAR

SOURCE: LYNDSEY AELICK – CTV NEWS

Despite a decline in passenger traffic and no government funding coming to the airport in Sudbury, staff have kept its doors open. “We are governed by Transport Canada regulations so in other words we can’t just close the doors and go home we have to keep the airport ready to go,” says Todd Tripp, Greater Sudbury Airport CEO.

Passenger numbers in the first quarter of 2021 are down 90 per cent at the airport but Tripp says while numbers are down in terms of the passenger traffic side it has seen an increase in general aviation traffic, that Tripp mostly thinks is for essential services.

The airport has not received any financial relief during the pandemic, and any dollars that the airport has brought in have gone directly towards expenses. In the fall economic statement, Tripp says over 24 million dollars from FEDNOR was to be divided amongst airports in the north, however, he is still waiting for that funding application to be approved.

The City of Greater Sudbury loans the airport money and acts as their bank, Tripp said. Recently the airport received approval from City of Greater Sudbury city council to have its line of credit increased by 5 million dollars bringing its total to \$12.5 million.

“If you’d have asked me 6 to 8 months ago I would have said that travel is not going to happen for years. I’ve changed that a little bit in that I think there is going to be some requirements to be ready to go for the leisure travel.”

STARTUP AIRLINES HOPE TO CAPITALIZE ON PENT-UP TRAVEL DEMAND

SOURCE: CBC NEWS

Ravinder Minhas, a founding board member of upstart Canada Jetlines, believes that there’s never been a better time to launch an airline in Canada.

As restrictions begin to lift and the prospect of more normal times beckons, the airline industry stands to gain. For more than a year now, people have been cooped up inside. Carleton business professor Ian Lee says startup airlines such as Canada Jetlines are able to take advantage of current downturns in the industry. ‘The planes are cheaper. The labour is cheaper,’ he said. “With the vaccine rollout, we’ve seen a lot of that pent-up demand start to translate into more bookings, both for late spring and summer.”

That is why entrepreneurs see an opportunity. In fact, the Wall Street Journal, citing an aircraft leasing company called Avalon Holdings, says more than 90 airlines are launching this year.

Minhas says newer airlines are poised to take advantage. He also says travellers are ready to flock back onto planes. Canada Jetlines will soon offer flights to sun destinations with cheaper fares than legacy carriers, in part because they were able to strike those good deals.

“We’re starting to see that recovery,” says Minhas. “It’s going to happen. We just need to hold on and have a little bit more patience to get there.”



SYDNEY FIRM CLAIMS IT WILL RELEASE AIRLINER BY 2025

Source: Australian Aviation

A Sydney-based company has signed a deal to create a 100-seat supersonic airliner that it believes will enter service as soon as 2025, Australian Aviation can reveal. Cosmovision Global Corporation claims the new aircraft could fly between Sydney and LA in less than six hours and would boast a flight range comparable to a 787-9.

The business will compete with a range of international companies, including Boom Supersonic and Spike Aerospace, vying to become the first commercial supersonic jet to enter service since the Concorde.

The business believes it will be first transcontinental and trans-Pacific supersonic passenger jetliner in Australia. Cosmovision said it would be arranging “financial resources” for its development and also obtaining “all necessary Australian approvals, permits and licences required for development, production and testing of the prototype engine”. It said it’s already heard from “many potential investors” keen to invest. The three-year agreement between the trio was signed on 28 April 2021 by Cosmovision’s Osadchuk, Motor Sich’s president Vyacheslav Boguslaev, and Ivchenko-Progress director of enterprise Igor Kravchenko.

In March, World of Aviation reported how supersonic jet maker Aerion has reportedly confirmed orders for 20 of its AS2 supersonic business jets by private aircraft firm NetJets, as well as the launch of a new supersonic aircraft training facility. The AS2 is vying to become the first supersonic aircraft to enter commercial service in 51 years, as well as the world’s first supersonic business aircraft.

The supersonic jet is powered by fuel-efficient GE Aviation turbofan engines, with the engine-maker confirming it has successfully completed initial designs for the jet engine. Meanwhile, rival aircraft Boom Overture has already clocked up very high-profile orders from the Sir Richard Branson-backed Virgin Group, Japan Airlines and the US Air Force.

NEW IATA BOSS VOWS TO SPUR THE DIGITALISATION OF AIR CARGO

Source: Air Cargo Eye

WILLIE Walsh, the new director general and chief executive of the International Air Transport Association (IATA), is to prioritise the eradication of paper from the airfreight industry as the air transport industry eyes its recovery beyond the pandemic, writes Thelma Etim.

He wants to dramatically accelerate the removal of airfreight paper. “Not only is this important to enable efficiency, but you [must also] consider the amount of weight, believe it or not, that’s being carried around on an aircraft simply because of all of this cargo paperwork.

“It is not required, it is adding to the weight of the aircraft, [and] we look at every kilo of weight we have on an aircraft for fuel-burn and environmental reasons and I think there is a great opportunity to accelerate the work that we’ve done [so far],” Walsh points out.

The decision to turn digital comes from the profit losses during the pandemic. Targeting fuel burn will help cargo carriers save money on hauls and help them stay profitable. Not only will this saving money, but it also has the potential to significantly reduce the greenhouse gases released into the air.

ALLEGIAIT AIR PLANS TO HIRE NEARLY 200 PILOTS AMID TRAVEL INCREASE

Source: Las Vegas Review-Journal

Allegiant Air, a Las Vegas based low-fare carrier announced that it plans to hire 184 pilots, which would represent nearly a 19 percent increase over the approximately 1,000 pilots already employed by Allegiant.

The company’s hiring plan was attributed to its growth strategy tied to meeting increasing travel demand. The first group of new pilots will begin training in July, with classes scheduled to run periodically through early 2022. Last year, Allegiant laid off 87 employees and eliminated 220 positions as it saw passenger counts plummet. The company employs more than 4,000.

Air passenger volume across the country has been steadily increasing as states relax coronavirus-related restrictions and more people are vaccinated.



HOW INUIT-OWNED AIRLINE CANADIAN NORTH CHANGED COURSE THIS YEAR

Source: *Toronto Life*

Despite the loss of business due to the pandemic, Canadian North's customer base still needed the company to deliver food, medical supplies and COVID tests. Here's how they navigated unprecedented change.

The company was optimistic that due to the unique geography that the company operates in and the essential services they provide, they would be minimally impacted by the pandemic. Despite their optimism, their bookings dropped 80 to 90%.

The company rapidly created a COVID response plan, but their efforts still put bookings below 50% of their regular numbers. But thanks to their own quick-thinking and support from their CIBC Relationship Manager and Best Managed coach, they've been able to survive, and even innovate.

Canadian North's finance department turned its attention to saving money, which meant:

- Freezing all hiring, projects and capital investments
- Changing flight schedule, leading to immediate cash relief, saving on fuel, landing fees, catering, sales related expenses and variable staffing.
- A reduced salary for the executive team to help control expenses.

Then, they turned their focus to funding. They received funding from the governments of Nunavut, Northwest Territories and Quebec, as well as Transport Canada.

From there, Canadian North:

- Applied to federal programs, including the Canada Emergency Wage Subsidy
- Made sure employees who were impacted by COVID received an emergency income supplement.
- Ramped up communication, delivering weekly messages and distributing a newsletter, dubbed #CNStrong.
- Marked the events that were important to employees, such as Pride Week, the Calgary Stampede, Nunavut Day and Christmas—even if it was only virtual.

Jeff Burns, Market Vice-President, Commercial Banking says that the commitment to the community makes the company stand out. He also says that their ability to practice change management helped, too. While the company's team is looking forward to getting back to pre-pandemic passenger traffic, they are planning to keep the innovation and changes they have made in the pandemic period.

INTRODUCTION TO "LIVING A REVENUE CULTURE"

Source: *Rick McPartlin – The Revenue Game*

There was a pattern of technology driven bubbles that repeated for 150 years where sellers took advantage of buyers and buyers becoming wary of the seller's promises and products. As the 20th century ended, there was a seller culture of short-term focused thinking about buyers, in terms of sticky contracts, targets, share of wallet, and readiness for upsell or cross sell.

With the approach of the 21st century technology started to change the world again. These 21st century technologies transferred the control of the buyer seller relationship back to the buyer. Databases like Yahoo and Google, buying services like eBay and Amazon, plus social media, and independent product reviews eliminated naïve buyers. The sellers became transparent – not primarily by design but more because of these technologies. Sellers could no longer make promises that their operations and delivery did not fulfill without being exposed. Sellers no longer controlled the flow of the information the buyers needed to make decisions. The literature and brochures that salespeople used to control of the buyer were now available in a digital world without any salesperson involvement, as were complaints and lawsuits.

This new transparency makes the difference between what the seller says and what the seller does clear to any potential buyer or employee interested enough to go to the web. This increased the seller's challenge to hire enough talented staff to sell and support their products. Now these employees have lots of choices, are reasonably compensated, and yet they demand more. The 21st century employee who is reasonably paid also demands to do something interesting and important. The days of treating employees as a placeholder until software or robotics replace them are over. In other words, today's employees want to work in purpose driven culture that provides value to the buyers.

Today, with the buyer in charge, the successful seller has learned to start with a purpose driven culture. This purpose needs to be bigger than just making the seller rich. Sellers must be profitable, or they will not survive, yet the best way to be profitable is to have a culture that adds value to the buyers, motivation to the staff, and makes the community better off. Sellers that organize themselves in this way not only have a good culture, but they live a repeatable revenue culture.

When an organization understands that long-term success is about transferring and monetizing buyer value that justifies the seller earning profit – the concept of a predictable business culture becomes obvious and is highly desirable vs hoping for luck as a strategy. For these cultures, revenue is not the goal but the natural outcome of deploying and executing on the purpose. This approach not only increases the topline, but reduces the sales cycle, increases the margin, while reducing turnover in staff and customers.

No buyer or staff member wants to work in an organization that forces them to endure 20 to 50% of the relationship time in chaos. When an organization has a purpose, the staff work there because they are committed to advancing the purpose. If 30 to 50% of their time and energy is directed to survive chaos they will not stay for the long game. If your buyers must endure 30 to 50% of their relationship being impacted by chaos, they will find another supplier that at least makes their life easier.

Those organizations that "Live a Revenue Culture" are different from everybody else. Every member of this culture starts the day focused on an important purpose that adds value to everyone they touch. They work with people who share the same belief and are committed to the same long-term mission. They avoid the chaos created from chasing random bubbles and demonstrate their maximum value when the bubbles of others burst. When the rest of the world screams uncertainty the organizations "Living a Revenue Culture" renew their focus on purpose and commitment to each other which extends their long-term leadership and success.

You can start with Purpose, develop a buyer-back deployable Revenue Strategy that is continuously improved so that no matter what happens you will be "Living a Revenue Culture" and reap the benefits.

ANDREW O'BRIAN NAMED CEO OF REACH AIRPORTS**Source:** Reach Airports

Reach Airports, the U.S.-based joint venture between Munich Airport International's (MAI) US holding and CAG Holdings, announces the appointment of Andrew O'Brian as the company's new Chief Executive Officer. As an experienced business leader, O'Brian will assume responsibilities at Reach Airports on August 1, 2021.

Having successfully served in a number of key leadership positions in the aviation sector over the past decades, Andrew brings a wealth of expertise. His broad background, coupled with his deep understanding of how to transform business performance while leveraging operational resources, will guide Reach Airports in providing management, consulting and training services to airports in the North American market. In his new role, he will be responsible for overall company management, business development, and cooperation with airport-related partner firms.

"Andrew is a well-respected senior executive in the aviation industry. He has a track record of developing best-in-class airport organizations that provide premium service to clients and customers – this is exactly the caliber we are looking for to further build up Reach Airports as a strategic partner to airports, airlines and the public. Together we will bring Munich Airport's operational expertise and outstanding consulting and training approach to shape the US' aviation infrastructure for the future demands in mobility," says Dr. Ralf Gaffal, Managing Director at MAI.

RYANAIR AND TRINITY COLLEGE LAUNCH RYANAIR SUSTAINABLE AVIATION RESEARCH CENTRE**Source:** Aviation Business News

Ryanair, in partnership with Trinity College Dublin, announced plans to launch the 'Ryanair Sustainable Aviation Research Centre'- the first of its kind in Ireland. Trinity College Dublin provided a EUR1.5 million donation which Trinity will use to for a multi-disciplinary research team to engage in and accelerate research around sustainable aviation fuels, zero carbon aircraft propulsion systems and noise mapping. The project, which will employ six people, is due to commence in summer 2021.

This is supporting Ryanair's goal to power 12.5% of flights with sustainable aviation fuels by 2030". This research will also inform the policies of both EU and international governments on making aviation environmentally and economically sustainable, as well as harness future investments by the aviation industry towards sustainability.

Ryanair believes that aviation must play a leading role in addressing climate change, and is placing an increased emphasis on mitigating how its business impacts the environment. Ryanair's Director of Sustainability, Thomas Fowler, said they hope to keep air fares low and affordable for all EU families while reducing the impact of flying on the environment.

YVR IS PROUD TO BE CARBON NEUTRAL**Source:** Vancouver Airport Authority

Vancouver International Airport announced that it is the second airport in Canada to achieve carbon neutrality.

They are now securing carbon neutral accreditation through the Airport Carbon Accreditation (ACA).

They reached carbon neutrality in three steps:

Step One - Measuring Emissions: YVR measured their GHG emission output before reducing their emissions in order to map their emissions reducing goals correctly.

Step Two – Reducing Emissions: By looking at their GHG footprint, they were able to find out where reductions in GHG's were possible. Some examples include replacing lighting in the terminal with energy efficient light bulbs, electrifying some of their fleet, and exploring the use of renewable fuels.

Step Three – Purchasing Offsets: To take accountability for their remaining GHG emissions, they purchased high-quality, local carbon offsets. They selected the Darkwoods Forest Offset Project in the West Kootenays. The amount that they purchased is the equivalent of 2,194 homes' energy use for one year.



ELECTRIC VS HYDROGEN – WHICH IS BEST FOR THE FUTURE OF AVIATION

Source: *Simple Flying*

That commercial aviation needs to do everything it can to mitigate its contribution to greenhouse gas emissions is no longer up for debate. Airlines are investing in everything from carbon capture to sustainable aviation fuels, along with hydrogen-powered and electric aircraft. But which of the latter two is the better option?

Aviation is also predicted to grow substantially over the next couple of decades, despite the hiccup caused by the fallout from the ongoing global crisis. With aircraft emissions forecasted to triple during the first half of the century, it must do its part in mitigating transport-related climate impact.

While still some way from becoming commercially viable, electric and hydrogen-powered aircraft are no longer mere ideas in some futuristic sci-fi novel. Rather, they are on the brink of generating a seismic shift in aviation technology. However, the real question is – what is best for the environment? As always, when it comes to energy sources and their sustainability, it is not only a matter of what happens when they are being utilized – but how they are produced.

Pros of Hydrogen

- Contains almost as much as three times the energy pound for pound as fossil fuels
- Faster option than electric

Cons of Hydrogen

- Transporting, storing, and refueling hydrogen requires investments on a large scale.
- Takes up about four times the volume of fossil fuels due to a lower energy density
- Challenges on how to store hydrogen on an aircraft
- Liquefying hydrogen involves cooling gaseous hydrogen to below -253°C (-423°F) and requires about 30% of the energy content of the hydrogen itself. Moreover, it is expensive.
- Public perception of the safety of hydrogen. According to a survey reported by the World Economic Forum, only about half the respondents considered hydrogen to be ‘generally safe,’ while 30% even believed it to be ‘generally dangerous’.

Pros of Electric

- Electric infrastructure requires less investment – electrical grid already in place
- Easier to adapt
- Less costly
- Quieter – reducing noise pollution considerably
- Renewable if energy is produced by hydropower or other green power options

Cons of Electric

- Batteries not progressing fast enough
- Not green or renewable if energy produced from coal

How ‘zero emission’ flights will actually be will depend on the manner in which electricity and hydrogen are produced. Meanwhile, the same is even more true for hydrogen. Hydrogen in and of itself is a clean fuel. However, the production of hydrogen is still incredibly polluting. For a shift towards hydrogen to support the true decarbonization of aviation, the production of so-called ‘green’ hydrogen must ramp up significantly.

Regardless of the exact environmental applications, most likely electric and hybrid aircraft will complement each other. After all, as previously stated, commercial electric flight will not require massive infrastructure investments, and it will most likely be available before hydrogen aircraft make it to market.

Thus, the two can complement each other. Electric aircraft will probably become prominent in urban mobility and commuter markets, while hydrogen will power airplanes designed for medium-haul routes.

TO SERVE CANADIANS POST-PANDEMIC, CANADA’S AIRPORTS NEED A RECOVERY PLAN

Source: *International Review*

Canada’s aviation community thankfully is not where we were at the start of 2021. On 13 April 2021, the federal government announced a financial support package for Air Canada, that includes up to \$5.4 billion in low interest loans and a \$500 million equity stake. In exchange, Air Canada agreed to reinstate or provide interline agreements for 20 regional airports that had seen their service suspended in the past year and to refund ‘non-refundable’ tickets.

The good news is being tailed by the bad news, having slower-than-anticipated vaccine roll out and an increase in the number of virus variants in the populations have amplified people’s uncertainty about travelling, stalling any short term recovery. Also, with a surplus of changing rules varying by province and the government discouraging any travel at all, it is making people reluctant to travel anywhere.

While the government’s actions to protect citizens is both commendable and necessary, the reality is that our airport model has totally collapsed. Since the government has made it virtually impossible to travel, it has an obligation to protect Canadian airports, so that they are ready to emerge from lockdown and serve their passengers when the time is right.

We need a national industry/government plan, similar to Australia’s National Economic Recovery Plan, that incentivizes tourism and travel and also provides direct support for certain airport services.

Without decisive government action that includes a long-term commitment to the financial health and resiliency of our air sector, air travel will not only become a lot more expensive, but Canadians will have fewer choices of routes and destinations. To date, Canada’s airports have received limited government support, providing relief for about a quarter of the cost of wages and about 30 per cent of the total annual fee that 22 airports must remit to the federal government as ‘ground lease rent’.

The government has a huge stake in the successful recovery of the air sector. We need government leadership to create a comprehensive plan that takes into account the reality of Canada’s vast geography and relatively small population, coupled with our reliance on air service for access, wealth-creation and jobs.

Implement a moratorium on ground lease rents and provide options for interest-free loans (or equivalent operational support) until the business recovers, which could take five years or longer.

Expand national transportation infrastructure funding to meet safety, security and transit needs and adapt to COVID-19 and climate change, including permanently expanded funding for safety infrastructure at Canada’s smallest commercial airports.

WESTJET-YVR COVID-19 TESTING STUDY DEMONSTRATES RAPID ANTIGEN TESTING IS EFFECTIVE IN SCREENING TRAVELLERS AND CONTRIBUTING TO HEALTHY AIR TRAVEL

Source: Vancouver Airport Authority

Research conducted by UBC and Providence Health Care at YVR shows extremely low risk of transmission of COVID-19 in airline passengers on domestic flights and that rapid antigen testing is an effective, acceptable and cost-efficient method for screening travellers and contributes to safer and healthier air travel.

Over a four-month period, nearly 600 departing passengers at YVR were tested for COVID-19 using rapid antigen testing. All tests administered during this period were negative, leading researchers to conclude that transmissible infection in airline passengers departing from YVR is likely to be less than one per cent.

Participant feedback was resoundingly positive, with many saying the procedure was efficient, more comfortable than expected and instilled confidence about the safety of their travels. The research team found the test itself took approximately 15 to 20 minutes, resulting in minimal disruption to the overall travel experience

DOE: U.S. HAS THE RESOURCES TO REPLACE ALL JET-A WITH SAF

Source: National Business Aviation Association

The U.S. has the potential to replace almost all domestic demand for Jet-A fuel with sustainable aviation fuel (SAF), although this would require a significant investment in infrastructure.

Annual U.S. production of jet fuel from renewable resources currently reaches less than 10 million gallons per year, a negligible amount compared to the 26 billion gallons consumed by the country's aviation sector, DOE scientists noted during a May 4 webinar hosted by the agency's National Renewable Energy Laboratory (NREL). However, research conducted by NREL shows that "by 2030 there is an energy potential equivalent of the fossil jet fuel demand."

"The Department of Energy has conducted a significant analysis of potential carbon sources that could be used to produce SAF," said NREL Senior Research Engineer Derek Vardon. According to Vardon, agricultural residues and other sources could generate more than 20 billion gallons of SAF each year – even with a third of this biomass allocated to gasoline and diesel alternatives – while a further 10 billion gallons of SAF could come from waste carbon sources, such as animal manure, wastewater sludges, food waste, municipal solid waste and industrial waste gas.

Vardon noted that these fuel sources would require substantial investment to move them from proof-of-concept to commercial-scale production, but, he added, "with the caveat that all of these are feedstock and pathway-dependent, and estimates will vary, at least it does provide a rough estimate of the potential energy availability within the U.S. for biofuel production that is commensurate with jet fuel consumption."

The DOE scientist also pointed to significant growth in current SAF production, fueled in part by California's low carbon standards, which should increase annual stocks to 4 billion gallons within the next two or three years. Vardon also pointed to the additional benefits of SAF production beyond its ability to substantially reduce aviation's carbon emissions. "Certainly, from a broader standpoint, the production of SAF provides critical links to both agriculture, food security and waste management practices, so there are opportunities for cross-sector benefits at the intersection of energy and environment," he noted.

The DOE also believe the U.S.'s current aviation infrastructure could accommodate the widespread use of SAF if fuel terminals are chosen to blend the renewable fuel with JET-A, said NREL senior engineer Kristi Moriarty. Noting that current regulations do not allow SAF to be transported in pipelines, and that SAF will be produced in standalone plants, Moriarty explained that NREL has researched fuel terminals, airports, refineries, airports and greenfield and brownfields locations as potential sites to blend SAF with fossil-based jet fuel.



THE CONSTRAINED FUTURE OF AVIATION

Source: *Resilience*

Andrew Curry's talk, an event organized by Manchester Metropolitan University and the University of East Lancashire, was on how aviation would get by in carbon constrained world – and the answer is: not well. This is a summary of what was said.

Aviation's core problem is not the 2.5% of carbon emissions it contributes worldwide, its problem is that carbon emissions are baked into its business model. The activist artist Sterling Crispin calculates that aviation's emissions per dollar of revenue are up there with the beef industry, widely acknowledged as one of the global warning bad guys.

Aviation needs dense energy, especially for long haul, both for reasons of thrust and for reasons of weight. There are some gains to be had from improved aircraft design, and some from redesigning flight paths, especially for takeoff, but these both take time. The replacement cycle for new planes is 15 years, and many fly for 25 years.

The other bet the industry is making is on biofuel and synthetic fuel. To read some reports, the industry just needs to mop up almost all of the clean biofuels available worldwide and its problems are over. But that's not going to happen. There's competition for biofuels and there are other industries where the emissions reduction effect is greater. The UK Committee on Climate Change reckons that about 10% of biofuels ought to end up in the aviation sector.

Synthetic fuels basically convert energy into liquid fuel – energy into energy, in other words – by sucking carbon out of the air. There is not enough known about this to be done on the large scale, though.

Then there are the alternative power solutions – battery and hydrogen, as in other mobility sectors. The first generation of hydrogen planes is unlikely to come into mainstream service until 2050s, and the current view is that this won't work for long-haul.

The most effective hydrogen planes probably need a significant redesign to accommodate enough fuel, but the more radical the design, the longer the testing and approval process.

Another issue is the proportion of business passengers in the passenger mix. In the UK this has been in steady decline for 20 years. This is likely connected to changing attitudes to work and to family among businesspeople. But now, as investors put pressure on businesses to reduce emissions, business travel is in their targets. Nestlé last month said that its "net zero" goal required not just changes in the way its agricultural suppliers operated but also a reduction in business travel.

The airlines reckon that they can repurpose their business class seats for 'luxury travel'. This is a problem because once the business market goes, the economic argument for aviation also goes, and with it the political cover for expanding aviation.

The projected climb on carbon prices to circa \$100 a tonne by 2030 will also hurt. All of these issues suggest increasing costs and serious business model challenges. People should have the opportunity to travel, in ways that environmentally, culturally, and socially respectful. It's always worth noting that flying correlates strongly with income, nationally and globally. In the UK, 15% of people account for 70% of all flights; globally less than 20% of the world's population have taken a flight.

There is a design for 21st century zero-emissions airships that can carry substantial loads, or passenger numbers, powered by solar and storage. They fly lower and slower than planes, but they have other advantages, beyond the environmental gains. They are all-but-silent, and they take off vertically, like a helicopter, from a space the size of a football field. The project had gone no further than the design, as there was no investor willing to put up the money to get to demonstration stage. But if we're really serious about a zero-emissions aviation sector by 2050, this ought to be what our innovators are working on.

FLYZERO RAMPS UP AS PROJECT SCOUTS FOR GREEN AVIATION CONCEPTS

Source: *Flight Global*

The UK's FlyZero initiative has begun investigating different aircraft architectures and powertrains as the project begins to hit its stride. FlyZero was launched in 2020 with the aim of enabling zero-emission flights in the UK by the end of the decade. But alongside the air vehicle itself, the project will also build

A business case for its operation and examine the industrial infrastructure required to bring it to market.

Speaking on a 5 May webinar, David Debney, FlyZero chief engineer, whole aircraft integration, said that around 15 different trial designs using a combination of different features such as energy sources or architectures are being examined. Their aim is to take forward two or three more detailed concepts into the next stage of the programme.

A total of 24 "technology bricks" form part of the overall study, ranging from different fuel or power sources, to powertrains, electrical distribution systems, and those in the wider ecosystem such as air traffic management.

Possible fuel sources include hydrogen and ammonia individually, or in combination. While batteries are under study, Debney acknowledges that they are unlikely to improve quickly enough to meet the power and energy needs of commercial aviation. Although some technology bricks are obvious – propulsion systems, for example – FlyZero is also examining topics that may seem to have little to do with an aircraft's emissions, such as landing-gear.

Chris Gear, project director, says the main focus of the research is on regional or single-aisle aircraft operating routes of 920-2,800km based on the feasibility of achieving zero-emission flights by the 2030 deadline. Cutting greenhouse gas emissions from regional and short-haul operations will also have a larger benefit, adds head of sustainability Naresh Kumar, as they create almost 50% of aviation's carbon dioxide output.

While CO₂ is FlyZero's main focus, it is also looking to cut other emissions, such as nitrous oxides, particulate matter and noise. Additionally, limiting the production of water vapour is another area of focus, given its role in the formation of cirrus clouds that can also have a warming effect on the atmosphere.

FlyZero currently runs until the end of 2021. It is funded through the Aerospace Technology Institute, with the government paying the salaries of staff seconded to the project from their employers. Around 80 people are now working on FlyZero, up from 30 at the beginning of February.

THE CONSTRAINED FUTURE OF AVIATION**Source:** Resilience

The collapsed airline 'Flybe' will return to the skies this summer after administrators said they have sold it to Thyme Opco.

Flybe was an Exeter-based carrier which had a major presence in UK airports, and flew the most UK domestic routes between airports outside of London. The purchase of the company is in hopes of enhancing regional connectivity and creating job opportunities within the airline industry.

The company will be smaller than before but will be flying on many of the former routes. Subject to more relaxed travel restrictions due to the covid-19 vaccine, the company is excited to launch a new and improved airline that is strong, reliable and customer-focused. Thyme Opco will be renamed Flybe Limited.

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