

# Climbing to a greener summit

Ahead of the global COP26 green summit in Glasgow, UK, at the end of this month, Airbus hosted its own summit in Toulouse bringing together a wide range of international stakeholders to outline the future of sustainable aerospace.

**TIM ROBINSON** FRAeS reports.

**H**eld on 21-22 September in Toulouse (and livestreamed via YouTube), the Airbus Summit was a unique global event in bringing together a wide range of stakeholders, aviation media and experts to debate and discuss the challenges and opportunities of decarbonising aviation – along with wider sustainability efforts. While Airbus has organised these sorts of media events previously, most notably in its annual 'Innovation Days', this Summit, with a title of 'Pioneering Sustainable Aerospace' included not just company executives but airline CEOs, airports, fuel suppliers, ATM services and even a green transport NGO – making for a very diverse and in some cases frank exchange of views. Calling the climate change: "Probably our generation's most difficult challenge", Airbus EVP Julie Kitcher added: "This is an industry summit, not an Airbus summit. Reaching net zero will be the product of unparalleled co-operation".

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2035, AT THE SCALE OF AVIATION, IS TOMORROW. THEREFORE, WE HAVE TO BE FAST AND WE HAVE TO BE FAST TOGETHER

**Guillaume Faury**  
CEO, Airbus

The topics covered ranged from the optimisation of air traffic control to increase efficiency, to urban air mobility, space debris and human resources questions, such as recruiting and retaining a 21st Century workforce that sees sustainability and climate change as its No.1 priority. With this being the first 'in-person' large-scale aerospace event for many after 18 months of Zoom meetings, the event also featured a static display at Airbus' delivery centre, showcasing some of its products from the A321LR to the CityAirbus eVTOL. Let's take a look at just a few of the highlights.

## **ZEROe timeline on track**

One year ago, Airbus revealed that it had ambitious plans to develop the world's first hydrogen-powered narrowbody airliner with its ZEROe initiative by 2035 and called on others to join this vision of sustainable aviation. Though the company stressed





it was not shifting exclusively to hydrogen for future aircraft and this is one of its technology strands, it confirmed that its timeline was still on track for programme launch in 2026-28 and entry into service in 2035, with Airbus CEO Guillaume Faury saying that his confidence is 'higher and higher every day' with the growing momentum and progress: "We are more and more confident that it is an achievable goal". What criticism there is, he says, reminds him of previous doubters about Airbus' FBW (fly-by-wire) technology who said "Its never going to work, too challenging" and were proved wrong.

Faury, then, is sticking to his previous timetable, noting that 2035 is 'tomorrow' in aviation terms. First applications are likely to be in regional and short-haul aviation and progress in ZEROe is already accelerating. Next year, large-scale ground demonstrators to support the project will be launched, including one at Bremen which will leverage Airbus' space work to investigate hydrogen fuel tanks.

Meanwhile, the company has partnered with Air New Zealand to research the future of hydrogen-powered commercial airliner operations in New Zealand. Closer to home, Airbus has also agreed a partnership with hydrogen producer Air Liquide and French airport group VINCI Airports to introduce the first hydrogen gas fuel supplies in a pilot project in Lyon-Saint Exupéry airport from 2023, initially for ground vehicles, then expanding to liquid hydrogen infrastructure for aircraft between 2023-30. This then is an important point in Airbus' wider vision in that other sectors are also accelerating their

A static display at the summit featured the latest Airbus products and technology, from its Cabin Explorer A350 test bed to its CityAirbus eVTOL.

switch to hydrogen – with Glenn Llewellyn, VP Zero Emission Aircraft, Airbus saying that the renewable energy "ecosystem is moving extremely fast" .

Faury believes: "We are at a turning point when it comes to hydrogen," saying: "Hydrogen is made for aviation."

## SAF vs hydrogen

This optimism over hydrogen's suitability for short-haul airliners was echoed by budget carrier easyJet, whose CEO Johan Lundgren said: 'Hydrogen is key'. Lundgren, who is also partnered with US start-up Wright Electric on an electric airliner, went further and warned that, while SAF is useful for long-haul flights, it is not a long-term solution and it should not divert focus from true zero-carbon technology. This view was also shared by US low-cost Frontier Airlines CEO Barry Biffle who likened SAF to 'clean coal' or 'filter cigarettes' as not solving the underlying problem.

Meanwhile, legacy long-haul carriers invited to the summit, such as Lufthansa, LATAM and Cathay Pacific, stressed that SAF was available now and was a drop-in solution, with no technical challenges, just a matter of scaling up. "SAF may look less exciting [than hydrogen airliners] but is available right now" said Cathay Pacific's Grace Cheung, Head of Public Engagement & Sustainability.

She was backed up in this by Heathrow Airport CEO John Holland-Kaye who pointed to SAF as "very easy technology" and warned "If we don't get to net zero in 2050, we won't have a business." He

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also argued that smaller regional airports will find it difficult to make the big infrastructure investment for alternative zero-carbon fuels like electric and hydrogen.

Meanwhile, as well as its ZEROe initiative Airbus itself is to step up its push to SAF and will fly an A320neo on 100% SAF before the end of this year. This follows on from an A350 100% SAF trial flight earlier this year.

## Why no progress in ATM?

The summit saw frustration expressed about the slow pace of airspace modernisation – despite its potential for quick wins in saving fuel overnight without needing new technology or alternative fuels. EasyJet CEO Lundgren said the lack of progress with Europe's 'Single European Skies' (SES) was 'appalling' and called for Eurocontrol to be given a stronger mandate to push through change. On SES, Lundgren said: "Everyone agrees we need to get it done and then it doesn't happen", explaining that easyJet could cut emissions by 15% overnight if SES was introduced.

In the US, Frontier Airlines CEO Barry Biffle agreed, saying: "We hear a lot of rhetoric but don't see a lot of action" and noting that even the US "could really do with a revamp of air traffic control".

Meanwhile, SESAR Aviation Sustainability Manager Phillippe Lenne countered with the ATM viewpoint, noting that between 6-10% of CO<sub>2</sub> savings could be achieved with airspace optimisation, continuous descent and better ATC management. To that end, Air France, along with Airbus and DSNA, the French Air Navigation Service Provider (ANSP), have already kicked off 'more efficient flights' under the SESAR ALBATROSS project, which includes continuous

descents. Air France says this has huge potential and that, if all its flights into Paris Charles De Gaulle airport used continuous descent, then it could save 10,000t of fuel every year.

However, the summit panel of ATM and climate experts also gave a cautious response to addressing non-CO<sub>2</sub> impacts on the environment, particularly in reduction of contrails by small changes in operations and flight routing – arguing that any changes would need to be balanced by the impact on CO<sub>2</sub> emissions..

## Should new jet airliners be banned?

As well as debate between airlines over quickest route to decarbonisation, uniquely for an event organised by an aircraft manufacturer, the summit also saw more radical ideas introduced. Andrew Murphy, Aviation Director at Transport & Environment NGO, threw the equivalent of a verbal 'eco-hand grenade' into the discussion on Day 2, when he suggested that the sale of new jet airliners should be banned from 2035, to force airlines over to zero-carbon aircraft. Airbus chief Faury naturally disagreed, arguing that what was actually needed was the opposite, with an acceleration of airlines replacing older, less efficient jet aircraft with newer, more fuel-efficient types. Currently, only 10% of the world's airliners feature the latest generation of super efficient engines – meaning that fleet replacement with newer aircraft is still the quickest way to reduce fuel burn significantly in the short term, with an A320neo saving 20% in fuel compared to the older A320ceo.

While Murphy raised the issue of having restrictions on flying imposed by governments if the industry did not accelerate change, Airlines

Revealed at the summit was Airbus' CityAirbus NextGen – a winged eVTOL with fixed wings, V-tail and eight rotors.

4 Europe MD, Thomas Reynaert, argued against blunt instruments like fuel taxes, saying it would be “the least effective measure to reduce CO<sub>2</sub> emissions”. EasyJet’s Lundgren, meanwhile, pointed out that ideas to swap short-haul air travel for rail missed the fact that railway infrastructure – as well as damaging the environment itself – could also take up to 10-20 years to construct, by which time zero-carbon airliners could be available for domestic routes.

While this event showed that Airbus and its partners were willing to help drive decarbonisation, there were also differences over at what international level this should occur – with the elephant in the room being the need to get the world’s fastest growing aviation market, China, on board. Murphy, for instance, argued that going via ICAO to force China to follow the West’s lead on decarbonising aviation would take too long, with time already being lost. A better way, he said, was for Europe and the US to ‘lead by example’. However, Faury disagreed, pointing out ICAO’s previous success in creating a global aviation safety system saying: “we need a global, level playing field”, adding: “We need at least Europe, US and China to have a critical mass and the energy sector behind us”.

This view was shared by Annette Mann, SVP Corporate Responsibility, Lufthansa, who pointed out that, with SAF currently five times the cost of kerosene, there needed to be a level playing field at the global level, lest European carriers be forced into flying uncompetitively against rivals.

John Holland-Kaye, CEO of Heathrow Airport, agreed, saying: “We need all countries to sign up

to decarbonising aviation” but noted that already 75% of its airlines have already signed up to the net zero in 2050 goal.

## Pressure from passengers

At the summit, Airbus’ airline customers also revealed the increasing pressure and demand for passengers to up their game and go green. A survey of 1,000-2,000 frequent flier passengers this summer by Delta Air Lines found that, despite the pandemic, sustainability was the No1 concern.

Meanwhile, easyJet’s Lundgren, who noted that the budget airline already carbon offsets all its flights from 2019, said that 8-9% of passengers who are aware of easyJet’s carbon offsetting initiative, choose the airline over competitors if other factors are equal. Sustainability then, for some airlines, is not just the right thing to do but also good business sense.

This finding was backed up by SAS’ Lars Anderson, who said that his airline’s passengers want to know much more about how much emissions they create than they did even ‘a year ago’ with expectations increasing of airlines, even during the pandemic.

Yet, while climate awareness among passengers is undoubtedly growing, there are regional variations, with Cathay Pacific’s Asia-Pacific passengers informed knowledge/awareness of sustainability trailing Europe and US according to Grace Cheung, Cathay Pacific.

There is also the issue that, while many people may express a desire that their airline is more sustainable and climate-friendly, fewer are prepared



The first full-scale ‘Wing of Tomorrow’, a project begun in 2016, has seen the first wing begin assembly at Advanced Manufacturing Research Centre, Wales, Broughton, UK.

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to pay for it. Transparency and information will be the key then, to getting them on board.

## Airbus reveals NextGen eVTOL

As well as discussions and debate on commercial aviation and alternative fuels, the summit also saw Airbus unveil the next evolution in its Urban Air Mobility roadmap – the CityAirbus NextGen eVTOL. This ditched the ‘quadcopter’ CityAirbus configuration for a fixed-wing design with a V-tail and eight rotors. This will have a four-seat capacity, a range of 80km and a cruise speed of 120km/h with Airbus aiming to fly it in 2023, for certification in 2025. Balkiz Sarihan, Head of UAM Strategy Execution & Partnerships, Airbus stressed that the “ultimate objective [of UAM] is to provide a service to society” with UAM being a “complementary additional layer of services in a city.” She noted that its roles will be more than an air taxi to include emergency services, zero-carbon tourist flights and logistics for remote places – with these likely to be the first applications for eVTOLs.

At the Summit, Airbus Helicopters also showcased developments in more conventional rotary flight with its H135-based FlightLab technology demonstrator – which recently started tests with an electric engine back-up system (EBS). This acts as a secondary power source in the event of an emergency or turbine failure, allowing a safer autorotation and controlled landing. However, this electric power system also is the first step in a concept called ‘micro-hybridisation’ in which Airbus see ‘technobricks’ progressively unlock more and



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CEO, Heathrow  
Airport

more energy efficient helicopters which produce fewer emissions and are also quieter. Within a decade, Airbus Helicopters expects this approach to have slashed fuel use by 50%.

## Unlock X-wings!

The summit also saw Airbus reveal a new full-size ‘X-plane’ set to fly in the middle of this decade – the ‘Extra-performing Wing’ or ‘X-Wing.’ This will use a full-size business jet, a Cessna Citation VII fitted with a new active control technology wing, which includes gust sensors, pop-up spoilers, multifunctional trailing edges and a semi-aeroelastic hinge to create the most efficient and highly optimised wing yet – taking cues from nature and birds. Airbus says that this breakthrough wing will be ‘programme agnostic’ over all its products, either existing or in development. Developed by Airbus’ UpNext civil ‘Skunk Works’, the X-Wing builds on previous work with the AlbatrossONE sub-scale demonstrator and will be as revolutionary as sharklets, according to CTO Sabine Klauke.

While the X-Wing is still a computer rendering, there was news of actual wing hardware during the summit when Airbus announced that the first full-scale ‘Wing of Tomorrow’ had now started assembly in Broughton, North Wales. This project, which began in 2016, will test new technologies, materials and manufacturing processes for next-generation wings. The composite wing cover was manufactured at the National Composite Centre in Bristol, with sub-assembly at Airbus’ Filton site. Meanwhile, GKN Aerospace supplied the fixed



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trailing edge and Airbus' Bremen site providing the 'wing moveables'. Three full-size 'Wing of Tomorrow' demonstrators will be built – one for systems integration, one for structural testing and another for production modelling.

### Polluting space

The summit also featured presentations on the role of space in monitoring and combating climate change, with ESA DG Josef Aschbacher dialing in via video link. He pointed out that, despite the doom and gloom about human impact on the environment, it was satellites that first spotted the hole in the ozone layer – giving the evidence for international action to ban damaging hydrocarbons that caused it. Some 40 years later the ozone layer is now stabilised – an example of how humans can in fact fix the damage they create. Meanwhile, Jean-Marc Nasr, Head of Space Systems, Airbus Space, pointed out that the importance of satellites in monitoring and forecasting weather, such as the Aeolus wind-measuring satellite, increased massively during the pandemic when airliner fleets were grounded and unable to provide upper altitude wind data.

However, Nasr also warned that humans were also in danger of polluting LEO with space debris – a scenario that was giving him 'sleepless nights' and could make space "unusable for 50 years". He called for stiffer rules on those who deliberately create space junk – including criminal charges. Meanwhile, Aschbacher highlighted ESA's efforts to clean up existing space debris and also shift to a 'one up/one down' policy of sustainable space launches that would create a 'net zero' environment for space.



Airbus' X-Wing will graft a new biomimicry-inspired wing to a Cessna bizjet to test advanced wing technologies in representative full-scale flight

### Summary

This then was a unique event in many ways – not just in helping to set and shape the agenda ahead of the imminent larger COP26 Summit but also in the frank discussions and debate it produced. The wide range of presentations also brought in viewpoints from those that would previously not be at a traditional company press briefing, whether they are hydrogen fuel suppliers, UN climate experts or environmental NGOs.

Despite the differences, the summit showed that there is wide agreement across the whole spectrum of the aerospace and aviation sector on the need to accelerate and increase the momentum towards net zero flight – whether this is via ATM, SAF, hydrogen and electric or, more likely, all at once. Like the common ground of aviation safety, this is seeing traditional rivals come together to talk about sustainability now on a weekly or even daily basis.

Meanwhile, one year on from Airbus revealing its future vision for zero-carbon hydrogen-powered commercial airliners, Airbus is now more confident, both of the technology and the wider building momentum, with CEO Faury saying: "It is a collective challenge. But 2035, at the scale of aviation, is tomorrow. Therefore, we have to be fast and we have to be fast together".

Finally, as a physical gathering of the aerospace sector that reunited friends, colleagues and rivals after nearly two years of enforced separation, the summit was a poignant reminder of aviation as a 'force for good' connecting the world and bringing people together for that vital face-to-face human contact.