Issue 3

Tuesday
24 May 2022

FLIGHT EVENINGNEWS

EBACE 23-25 MAY 2022 | GENEVA

With distribution supported by CAE

Emission possible

Organisers believe 2022 show has started sustainability journey

Mark Pilling

Recycled PET bottles are just one of the materials used in the making of Bombardier's stand, according to Sandra Tymchuk (*l*), senior director marketing, and Eve Laurier, vice-president communications

The first EBACE in three years will be a springboard for big changes when it comes to sustainability in business aviation. That is the hope of NBAA and EBAA, who believe conversations about lowering the industry's carbon footprint, started at the 2019 show, will translate into action and the arrival of physical products that advance the sector's drive to zero carbon emissions by 2050.

"We need to amplify how creative and innovative this industry is," Athar Husain Khan, secretary general of EBAA told *Flight Evening News*. "We invited start-ups here to EBACE to showcase their technology. Right here is the tangible and touchable future of business aviation."

Two of these start-ups – Eviation and VoltAero – were on a Newsmakers panel this morning to discuss their respective electric and hybrid-electric programmes that they are convinced have the potential to make aviation substantially greener.

They are among eight companies in the Innovation Zone – the first area visitors reach when entering the exhibition hall – who are showing revolutionary aircraft concepts. They include the Pipistrel MAHEPA and EHang EH216 electric vertical take-off and landing vehicle.

The position of this zone, and the many sessions and roundtables on sustainability, is deliberate as "the industry needs to get on the front foot", says Khan. "It's not about a licence to grow, it's about a licence to exist." NBAA head Ed Bolen adds: "It's an overwhelming focus here at EBACE."

Electric propulsion and sustainable aviation fuel are key enablers in the first wave for the sector. Start-ups Eviation with its Alice all-electric nine-seater and VoltAero with a five-seat hybrid-electric Cassio aircraft talked about their plans this morning.

Both aim to bring fixed-wing aircraft to the market. However, Gregory Davis, interim head of Eviation, and Jean Botti, the founder of VoltAero, acknowledge that batteries are the hardest piece of the puzzle. "My life is all about batteries," jokes Davis, with both manufacturers doing their own development because there are no aviation specific battery makers.

The entrepreneurs understand they will one-day become interesting for larger players to acquire, but their mission is to get electric aircraft into the air. "You have to demonstrate something first," says Botti. "You don't need tonnes of money to start the pump."

"We dare to do it...and it's very difficult, but it's about sustainable aerospace and making sure we can fly in the coming years without penalties," says Davis.

Saving world with winglets

Aviation Partners hails product as sustainability booster as it closes in on next new airframer deal

Mark Pilling

Aviation Partners is eyeing the addition of another business aircraft type to its portfolio of blended winglet offerings, Gary Dunn, president of the Seattle-based firm tells *Flight Evening News*.

"We are in the early stages of analysing a potential winglet opportunity," says Dunn, with the undisclosed candidate likely to be an aircraft range with several derivative models. "It has got to have a significant in-service fleet because a lot of our business is retrofit."

Some 2,000 Aviation Partners winglet shipsets are flying today on Dassault Falcon 2000, 900 and 50s, Hawker 800s, and Boeing Business Jets. The firm has had its strongest 18 months ever, driven by the Falcon retrofit market, with sales of 40 shipsets. "It has been gangbusters," says Dunn.

The biggest issue for Aviation Partners is availability of retrofit capacity at its MRO partners with lead times of three to four months, says Dunn, and talks are under way to add capacity to shorten them.

Aviation Partners is beginning to add a sustainability narrative to its sales story, which has been all about fuel efficiency. "It is a message that is starting to land. Sustainability payback is now part of the equation," says Dunn.

Dunn: Sustainability message

Da Costa: Aircraft ideal for charter

Tecnam targets private aviation

EBACE debutant Tecnam is pushing the benefits of the P2012 Traveller as a business aircraft.

Walter da Costa, chief sales officer, says the show attracts "a wide variety of customers who will be interested in our aircraft as the modular interior provides flexibility for a host of missions from commuter to medevac".

The P2012 on display at the static is a €2.4 million ($2.5 million), nine-passenger model, which is ideal for the charter market, da Costa says. "We also expect the seven-seat executive variant, called the Club, to be a popular model with corporate and charter operators along with high-net-worth individuals," he adds.

Tecnam secured European and US certification for the Lycoming TEO-540-C1A-powered P2012 in 2018 and the first example entered service with US regional airline Cape Air the following February. More than 50 of the 950nm (1,760km)-range aircraft are in operation.

Da Costa says Tecnam is producing two P2012s a month from its base in Capua, near Naples. Monthly production will ramp up early next year to three.

GlobeAir mulls fleet replacement

GlobeAir – the world's largest operator of Cessna Citation Mustangs – is considering the replacement of its 25-strong fleet of very light jets by 2025 with the larger Citation M2 or HondaJet.

Bernhard Fragner, founder and managing director of the Hoersching-based company, says the fleet renewal has been under consideration for some time but given the uncertain global outlook a decision on whether to go ahead with the purchase will not be made until September.

"Interest rates are rising along with inflation, and the global economy could be on the brink of another major recession. I will have a clearer picture of the economic situation within the next few months, then I will decide whether to proceed with the plan," says Fragner.

Fragner is no stranger to risk-taking, having launched GlobeAir on the eve of the economic crash of 2008 with a trio of Mustangs.

GlobeAir is one of a tiny handful of similar air taxi companies that survived the downturn, but Fragner says his mindset "is very different this time".

"We founded the company in 2007 and were absolutely happy to take the risk as there was nothing to lose. I don't want to risk the last 15 years of hard work with stupidity," he says.

If Fragner does proceed, GlobeAir will purchase a mixture of new and used aircraft. "While we really like the HondaJet, the M2 is from the very familiar Citation stable which has served the company well. It also has a strong support network around Europe, which is vital for an operation like ours," says Fragner.

Irish body eyes new members

Ireland's new business and general aviation trade association, the IBGAA, is marking its formal launch at EBACE, and announcing its first conference this autumn. The event will take place at Adare Manor, Limerick on 17 November, in partnership with the EBAA. The association's founding trio – Josh Stewart, Joe Buckley *(pictured l-r)* and Dave Scully – are at the show, on the Irish Aviation Authority stand, to recruit potential members, joining the likes of ACASS Ireland, Gainjet and Woodgate Aviation.

H55's battery barrage

Swiss firm H55 is working on five to 10 unannounced projects that will exploit its technology for integrating electric propulsion and battery solutions into aircraft, says Andre Borschberg, the co-founder of H55 and pilot of the record-breaking Solar Impulse aircraft that completed a round-the-world flight using solar power in 2016.

"We are working on projects in electric battery and hybrid propulsion and with single or multi-engine aircraft. There are a lot of different configurations in this field," Borschberg tells *Flight Evening News*.

Borschberg is at EBACE marking H55's addition as a battery system supplier to Pratt & Whitney Canada's regional hybrid-electric flight demonstrator programme."We understand what the battery pack is doing when integrated into the airplane. Our focus with H55 is to provide electric propulsion solutions which can be certified by the [aircraft and engine] manufacturers," says Borschberg.

H55 founder Andre Borschberg with P&WC president Maria Della Posta

Images: Bizjyks

Satcom partners up on antenna

Business aviation solutions provider Satcom Direct (SD) has announced a three-way partnership agreement with global communications company OneWeb and aeronautical antenna supplier Quantenelektronische Systeme (QEST). The aim of the collaboration is to progress development of an electronic phased array antenna to support OneWeb's advanced mobility services.

The agreement also covers a long-term distribution partner agreement, where SD will market and sell OneWeb's high-speed, low-latency in-flight broadband services. Development has already begun on the flat-panel antenna, with initial demonstrator technology scheduled to validate over-the-air performance, in small form factor across the OneWeb satellite constellation in the fourth quarter.

Market introduction of the flat-panel, fuselage-mounted, electronic phased array antenna is anticipated in 2024, with OneWeb aviation services set to launch in 2023.

Pipistrel a 'perfect fit'

Textron's new subsidiary poised to launch new products

Dominic Perry

Pipistrel looks set to have a flurry of new and improved products on the market in the coming years as new owner Textron Aviation accelerates product development at the Slovenian electric aircraft specialist.

Textron completed the acquisition of Pipistrel in April, bringing the operation into its eAviation business and appointing Gabriel Massey as president and managing director to run the unit.

Massey, who has been with Textron Aviation for 18 years, most recently heading up its aftermarket business in Singapore, sees Pipistrel as the perfect addition.

"Pipistrel is pretty much a pillar of that sustainable aviation segment," he says. "From a priority stand point we want to bring the ideas and products they have to the market faster."

First up will be a certificated version of Pipistrel's Panthera four-passenger high-performance piston-single, which currently flies on an experimental certificate. Massey expects this to arrive in around two years, followed by a hybrid-electric variant before the end of the decade.

That will use a battery-powered electric motor combined with a small four-cylinder conventional engine to serve as a range extender. Performance characteristics should be in line with the baseline Panthera, says Massey, with the only change a reduction in cruise speed.

"The Panthera will be a perfect fit within the existing family of Cessna and Beechcraft aircraft – we haven't something in this exact four-seat, high-performance category before."

Massey is a Textron Aviation veteran

Images: BillyPix

Sloane squares deals

Leonardo Helicopters unveiled a clutch of VIP orders at EBACE yesterday, including a deal that will see UK operator Saxonair take an AW109 GrandNew light-twin via an agreement with distributor Sloane Helicopters. Separately, Sloane signed for three new AW109s, for delivery in the second half of 2023. Leonardo also booked commitments for a skid-equipped AW109 Trekker and two AW139s. Pictured are Saxonair's Christopher Gerskowitch and Sloane's John Parnell.

Making connections

Collins Aerospace is marking the EBACE debut of its newest business unit. Connected Aviation Solutions was formed after last year's acquisition of FlightAware, which provides digital flight tracking, predictive technology and analytics, and decision-making tools.

Haded by Jennifer Schopfer, the division is made up of FlightAware and various hardware products that were previously part of Collins' avionics arm, creating what she calls a "connected ecosystem" within the wider Collins business.

"We wanted to put together all the pieces," she says. "We had digital technologies before, but they were spread around a bit. With this reorganisation, we can go to market and offers full digital solutions to our customers, and work as a truly digital enterprise rather than one tucked under a traditional manufacturing business."

Creating a dedicated connected aviation solutions operation will also allow Collins to bring products to market more quickly, says Schopfer. "We are very much focused on agile development."

Collins has already begun integrating FlightAware features into its Arinc Direct service, including Foresight, which uses predictive models to determine estimated time of arrivals, and Ready to Taxi, which offers additional situational awareness to pilots on the ground.

FlightAware will continue, like Arinc, as a sub-brand within Collins.

Aguirre: Fast and affordable system

Small but perfectly formed

Gogo says electronically steered antenna, unveiled at the show, is compact enough to fit any business aircraft

Mark Pilling

Gogo Business Aviation has launched the first global broadband service in business aviation to use an electronically steered antenna (ESA) on a low earth orbit (LEO) satellite network.

Gogo's antenna assembly, designed in conjunction with Hughes Network Systems, will be small enough for installation on the fuselage of all business aircraft, and will operate on space-based communications company OneWeb's broadband global network.

"This will be a fast and affordable broadband system that will provide best-in-class global performance on the broadest range of aircraft in business aviation," says Sergio Aguirre, Gogo Business Aviation's president.

In related news, OneWeb has agreed a long-term distribution partnership deal with Gogo whereby the in-flight connectivity solutions provider will market and sell OneWeb's inflight broadband services to business aviation users globally.

Gogo has more than 4,500 narrowband satcom systems installed and flying worldwide and is a factory option at every major business aircraft manufacturer.

FLIGHT EVENINGNEWS

Produced by FlightGlobal, 1st Floor, Chancery House, St Nicholas Way, Sutton, Surrey SM1 1JB, UK

HOW TO CONTACT US

Editorial office Salle U

Editor Murdo Morrison murdo.morrison@flightglobal.com

Reporting team Dominic Perry, Mark Pilling, Kate Sarsfield

Production Rachel Warner

Designer Sarah Eversfield, Lou Murrell

Picture editor Jim Robbins

Photography Jeff Holmes

Distribution Dawn Hartwell, Steve Wood

Divisional director, FlightGlobal Sophie Wild

Printers ATAR Roto Presse SA, Geneva

DVV Media International

TAG trains on with CAE

CAE inked a three-year extension to its pilot training agreement with TAG Aviation at the show yesterday.

Andrew Kilvington, head of training and standards at TAG Aviation Europe, pictured right with Marc Parent, chief executive of CAE, says: "The quality of CAE's training and their global training network have made them a trusted partner since 2010."

Meanwhile, CAE is to deploy its first 7000X Series Dassault Falcon 6X full-flight simulator at its Burgess Hill training centre in the UK.

CAE is the exclusive training provider for the type.

"The Falcon 6X training programme is a significant step forward in terms of technology and training experience," says Nick Leontidis, CAE group president, civil aviation.

Images: BillyPix

In brief...

More CF34s

GE Aviation has extended Aero-Dienst's authorised service centre network agreement for the CF34, which powers the Bombardier Challenger 600 series.

Nuremberg, Germany-based Aero-Dienst has been an authorised service provider for the engine since 2011.

Another AOC

Jet Aviation has secured a San Marino air operator's certificate, giving its clients another option for registering their aircraft.

The Swiss company operates its managed and charter fleet of around 300 aircraft from 10 operation centres in Burbank, California; Chicago; Teterboro, New Jersey; Valetta in Malta; Cologne; Zurich; Dubai; Hong Kong; Singapore, and now the tiny republic which is an enclave in Italy.

Each of its AOCs are fully-staffed with a head of safety and head of compliance, says Jet Aviation.

Paris boost

Bombardier is to expand its line maintenance station at Paris Le Bourget. The Canadian manufacturer has added 3,000sq m of hangar space. "We are creating more opportunities for our business jet customers to leverage Bombardier's high-level OEM capabilities in the form of expertise, infrastructure and connected aircraft technology to deliver the most complete response to their maintenance needs," says Anthony Cox, vice-president customer support.

GJC forecasts five good years

Global Jet Capital is forecasting $187 billion worth of new and used business jet sales over the next five years, with the market growing at a compound annual rate of 5.1% over the period.

Contained in its updated market outlook – released during EBACE and first introduced in 2021 – the financing firm sees strong growth from the sector.

Demand for heavy and medium jets will outstrip that for other categories, the forecast suggests. In addition, North America will remain the largest market for business jets, followed by Europe, while Latin America will be an important pre-owned market.

"If you are active in the business aviation environment, you recognize that despite the continuing negative effect of Covid-19 on world health and various business sectors, its effect on business aviation has been altogether different.

"It's the unique value proposition of business aviation, supported by a mature industry demonstrating balanced supply and demand dynamics, that will support sustainable growth for the foreseeable future," says Andrew Farrant, Global Jet Capital chief marketing officer.

In brief...

Wexjet tie-up

Wexjet has been appointed Prime Trip Support's preferred ground handling company for the company's clients in Portugal and the Azores. Meanwhile, as part of the same partnership, Prime Trip Support will support Wexjet's fleet of managed aircraft with international trip support.

New TAG AOC

TAG Aviation has added a Cayman Islands air operator certificate to its AOC portfolio, opening a Cayman office and registering a Gulfstream G650. The company already holds AOCs from Malta, San Marino and the UK.

Training deal

FlightSafety International is to deliver training for unmanned cargo drone operator and manufacturer Dronamics.

Dronamics makes the Black Swan cargo drone which can carry 350kg up to 2,500km.

"Safety is the foundation of successful operations," says Sergio Oliveira e Silva, chief operating officer. "This is why we are partnering with FlightSafety."

BillyPix

Channel puts faith in Eclipse

Guernsey-based charter firm expands fleet to 17 examples of pioneering very-light jet

Eclipse is back at EBACE, but despite the very light jet (VLJ) brand being under new ownership after more than a decade of turbulence, the company behind the Eclipse 550 on the static display is operator Channel Jets.

The Guernsey-based charter company is a major advocate of the original VLJ, having grown its fleet from two to 17 Eclipses over the past two years after acquiring a batch of second-hand aircraft.

Taylor Stewart, assistant ground operations manager and a first officer with Channel Jets, who is running the exhibit with colleague Captain Michael Halloran (*left*), says the rapid expansion has been down to Covid-19.

With airlines grounded during much of the pandemic, many business people turned to the convenience of private air taxis, he says. "Additionally, the more Covid-conscious travellers saw business aviation as an ideal option. There is minimal contact with other people."

He describes the Eclipse as a "great option for short hops". Channel Jets provides charter around the Channel Islands – made up of Jersey, Guernsey and Alderney – and also to the UK and Europe.

Stewart says the company had always intended to become bigger, so the used aircraft "arrived at a very convenient time for us".

He adds: "Pre-owned Eclipse models are now in very short supply and asking prices have doubled in the last few months," says Stewart.

The price hike was boosted in part by the acquisition last year of Eclipse Aerospace assets to AML Global Eclipse, with the new owner pledging to protect the assets of the company, although it has not yet committed to restarting production.

No new Eclipse aircraft have been delivered since 2017, when previous owner One Aviation shipped six Eclipse 550s, with a total of 27 handed over in the previous three years, according to General Aviation Manufacturers Association figures.

Before that, no Eclipses had been sold since 2008, the year the original Eclipse Aerospace collapsed, when 161 were delivered.

China flights beckon for EHang

Mark Pilling

Full type certification of the EHang Holdings EH216 autonomous aerial vehicle (AAV) by the Civil Aviation Administration of China (CAAC) is only "a couple of months away", says Andreas Perotti, chief marketing officer Europe for the Guangzhou-based manufacturer.

This will enable the vehicle to operate in various forms of regular operation in China with 100 potential routes already identified, says Perotti. At present there are some 100 EHang AAVs operating in China in a variety of tourism activities under a special permit issued by CAAC.

The EH216 here at EBACE is a serial production model with its 16 electric motors, ability to carry two passengers, a 35km range and a top speed of 70kt (130km/h). The Chinese firm, and its Austrian strategic manufacturing partner FACC, were delighted to accept the organiser's invitation to showcase the EH216 in Geneva.

"Most of our resources are focused on our China development," explains Perotti. However, EHang is working with the European Union Aviation Safety Agency on design certification for the EH216. This level of certification will enable EHang to operate the EH216 in a variety of "proof of concept" operations in higher risk areas over built-up areas in Europe, says Perotti.

Christian Mundigler, vice-president of aftermarket services at FACC, is pictured with the EH216 autonomous aerial vehicle.

Pleasant dreams

When it comes to providing a good night's sleep here at EBACE the dreamiest experience is surely at the Euler Products stand where the Diep Sleep System is residing. Demand is "incredible" for the California-based firm which makes a large range of bespoke sleeping solutions for private aviation customers for any aircraft type, says Lori Diep, chief executive (*pictured*).

Euler Products is augmenting its bed solutions with models developed for Boeing Business Jet and Airbus Corporate Jet customers that typically want a conference table converted into a full lie-flat single or double bed where the bed is stored elegantly when not in use, said Diep.

The lead time on a Diep Sleep product is generally around eight weeks and the firm is hiring to add to its team of 10 to raise production rates.

Perfect finish

"The key for a beautiful interior is the detail. Your eye moves to the detail very quickly and that's what we provide," says Rick Niefield, vice-president sales & marketing at HighTech Finishing (*pictured*).

The Houston-based manufacturer, which has specialised exclusively in the interior parts for business aircraft since 1984, is at EBACE to talk primarily to designers and the buyers from completion and refurbishment centres, explains Niefield. It supplies high-quality, decorative metal parts using its multi-stage plating process and has 135 finishing options.

Gold used to be the most chosen colour for interiors but white gold and pearlite are ncreasingly popular. "There is a movement to a ghter shade, more open [aircraft] interior and e provide the colours for that," says Niefield.

Pocketing deals

Images: BillyPix

The reassuring click-clack of the billiard ball along with the solid and earthly presence of an olive tree are the symbols Dubai-based Hadid International Services has brought to EBACE.

The international trip support company is using the pool table to bring its "classic lounge" concept to represent "how we give customers comfort and provide the service they always look for", says Mohamed Kabbani (*above*), executive board member of a business that was formed in 1981.

Hadid employ 275 people across a network of over 2,000 airports where it provides services in addition to fixed-base operations in countries such as Dubai, Pakistan, India, and Italy. As it seeks to bolster its global footprint the firm is seeking to expand its operations in South America, the USA, Japan, Singapore, and China, says Kabbani.

The number of customer requests are increasing, and business is picking up. Demand is not the main challenge, however, with Hadid finding that it is becoming harder to expand the team with the same level of experience as the firm seeks to grow, says Kabbani.

GOOD AT ONE THING ISN'T GOOD ENOUGH FOR A FALCON.

What makes a Falcon so distinctive in comparison with other business jets? It is not one particular feature. Some Falcons have digital flight controls. Some have conventional controls. Some have three engines, others two. Each meets different mission criteria.

BALANCED TO PERFECTION

But all Falcons share a common—and unique—design approach. One that strives for balanced performance and comfort. That is, they are optimized in a way that other, overpowered, overweight aircraft are not.

Falcons are strong, yet light. In part, due to composites. They approach runways slowly, yet cruise speedily. They are military tough but are the epitome of sleek stylishness.

This makes them powerful yet fuel thrifty. In fact, Falcons are the most efficient business aircraft across the board. Up to 30% more efficient than competitors. And lower fuel burn means lower emissions.

GENETIC INHERITANCE

One way to think about the Falcon product line is to consider its military heritage.

In a fighter like the Mirage or Rafale, designers strip away excess. These fighters are immensely strong, of course, but not overbuilt. Their control systems are precision tuned.

The Falcon Digital Flight Control System is the benchmark for precision and responsiveness. Any pilot from any era will tell you that a Dassault aircraft, fighter or business jet handles beautifully. And passengers will appreciate the smoother ride that results.

EFFICIENCY IN EVERY INCH

Consider the wing of any Falcon. It's exquisitely clean. It is not overly large, which reduces drag at altitude. It also flexes in flight, reducing the effect of turbulence. During takeoff and landing Falcon flaps and slats enlarge wing area and increase lift for slower, safer landings.

Falcons fly where others can't because of this low-speed performance, opening up a vast number of airfields, some less than 4,000 feet. Whether it's Gstaad, Telluride or London City, they land closer to your final destination.

INNER SPACE TECHNOLOGY

Highly efficient use of space and materials has given Dassault designers the freedom to make Falcon cabins the best in the industry. Packed with the latest technology for a quieter, healthier, more spacious travel experience. And one that is highly connected.

Call it what you will. Balance. Optimization. Efficiency. Dassault has been refining this design advantage with each generation of Falcons. Maybe that's why over 2600 of them have been delivered since 1965. And why generations of pilots and passengers revere them.

Falcon

WWW.DASSAULTFALCON.COM | FRANCE: +33 1 47 11 88 68 | USA: +1 201 541 4600

DASSAULT AVIATION

In brief...

Oil's well at Farnborough

All diesel-powered cars on site at Farnborough airport are to switch to hydrotreated vegetable oil (HVO) as part of the business aviation hub's wider decarbonisation efforts. The airport says that HVO reduces net greenhouse gas emissions by up to 90%.

SAF bet at Monterey

Both FBOs at Monterey airport in California are now offering Neste MY sustainable aviation fuel (SAF) after supplier Avfuel agreed a deal with Del Monte Aviation. It comes a year after Avfuel began providing the product to Monterey Jet Center, which Avfuel says was its first "consistently supplied SAF location".

"Del Monte Aviation is pleased to offer aircraft owners and operators a low-carbon alternative at the forefront of the shift toward a sustainable aviation industry," says Matthew Wright, vice-president of Del Monte Aviation.

Bell chimes for Karen

Swiss aviation company Karen is to buy two Bell 505s, in a deal announced just ahead of EBACE. Karen, which was founded by pilot Enzo Carlino in 1999, will use the aircraft for VIP and commercial flights. Karen already has a fleet of Bell 206 helicopters, and also offers pilot training and aircraft management.

API Provo approval

Business aviation maintenance, repair and overhaul specialist Duncan Aviation says its Provo, Utah facility has become the company's latest facility to be approved as an installer of Aviation Partners (API) blended winglets.

Duncan has been offering API blended winglets on Dassault Falcons since 2008, when it installed the product on a 2000EX under a supplemental type certificate. API appointed Duncan's Battle Creek, Michigan, and Lincoln, Nebraska sites as its first authorised installers for Falcon aircraft.

Duncan says it now has over 10 years of experience of completing this modification on Falcon 50-, 900- and 2000-series aircraft. It is also an API authorised installation partner for winglet modifications on Hawker 800 series aircraft.

ExecuJet's expansion

ExecuJet MRO Services says it is nearing completion of its MRO centre at Dubai's Al Maktoum airport, with a planned opening in the third quarter. The Dassault Aviation subsidiary says the 15,000sq m (163,000sq ft) facility will cater for up to 24 business jets, and will also house workshops and offices. It replaces ExecuJet's existing site at Dubai International. "Dubai is a hub for so much global traffic that it merited a large investment in MRO capacity," says Nick Weber, regional vice-president Middle East. Dassault acquired ExecuJet's MRO network in January 2019, with the airport services and aircraft management business remaining with Luxaviation.

Charter is flying at Volare

Volare has a fleet of 12 helicopters

Volare

Hangar8 founder Dustin Dryden's new, Oxford-based business has taken an unexpected turn since the start of the pandemic

Murdo Morrison

Like a lot of successful and energetic entrepreneurs, Dustin Dryden decided semi-retirement was not for him after the aircraft management outfit he founded, Hangar8, was merged with Gama Aviation in late 2014. Within a year of leaving the amalgamated entity – which kept the Gama name – Dryden was back in business, and back at Oxford airport, where Hangar8 was based.

His new company, Volare, initially focused on buying and selling used jets and helicopters, but has diversified into aircraft management, and, in the past two years, charter. The latter has become Volare's fastest-growing activity. "Covid changed everything. Two years ago, we would never have dreamt of entering this business," says Dryden. "But it's the real growth part for us at the moment."

He attributes this to the fact that flying privately lost its stigma during the pandemic, as wealthy individuals sought out reliable, hassle-free, and virus-proof alternatives to flying commercially. "It re-set people's values. Travelling by airline became difficult," says Dryden. "Chartering an aircraft became more socially acceptable, and once people have tasted it, they don't tend to go back."

Volare has a fleet of 31, Guernsey-registered aircraft – 19 fixed-wing and 12 helicopters – but says this will hit 50 by the end of the year. All but two are available for charter. The company's business model varies from other management and charter companies in that Dryden buys used aircraft on spec and refurbishes them, before finding buyers.

Typical are the seven ex-medevac Leonardo Helicopters AW109Es Volare acquired from Babcock International in 2021. The 2000s-vintage rotorcraft are being refurbished into a VIP configuration with two rows of three seats. They have also had their avionics upgraded and been repainted. Dryden says all of them have been snapped up within days of going on the market.

Dryden admits that its purchase-first-then-sell model is "cash flow sensitive", but says that, so long as there is a sellers' market, as there is at present, Volare is able to shift assets from its books very quickly. At the same time, because most are in need of refurbishment, the aircraft it buys and supply chain it engages with are not available to a retail buyer.

The risk is that "the marketplace shifts quickly", leaving Volare with depreciating equipment on its balance sheet. However, even after the financial crash of 2008, values did not plunge overnight, says Dryden, who believes that one of Volare's strengths is its strong cash position. "A lot of our ability to buy at the right price is having the cash at the right time," he says.

Volare delivered 21 aircraft last year, mostly with management contracts. Almost all its customers are from the local area – the Cotswolds has one of the highest ratios of multi-millionaires in the UK – and many are first-time owners, says Dryden. Guernsey's 2-prefix gives them the opportunity for fun personalised aircraft naming, such as 2-FAST.

Volare, which employs around 100 staff and occupies from two airport-owned hangars, one dedicated to its helicopter business, is approved to carry out maintenance on most major brands, except Dassault. It has just taken delivery of its – and Oxford airport's – largest resident aircraft, a Boeing Business Jet.

Dryden – who started as a pilot before running Cirrus and Hawker-Beechcraft distributorships – set up Hangar8 in 2005, going on to list the company on the London stock exchange three years later. Despite geopolitical headwinds at home and globally, he sees no signs of a slowdown. "This marketplace is the best I've seen it in some time," he says.

Guernsey registration gives owners a chance to be imaginative with their aircraft naming

Volare

Reaching out for teachers

Fancy teaching an educational session at the NBAA convention and exhibition in Orlando later this year? If so, you have until the end of the week to submit your proposal.

NBAA is looking for "world-class presentations that will evoke excitement and are focused on forward progress and future growth" for the event, which takes place from 18-20 October.

The association says proposals should feature peer-to-peer learning, be interactive and include live polling. Special consideration will be given to those that focus on: workforce and leadership development; emerging technologies; sustainability; diversity, equality and inclusion; and advance air mobility.

NBAA will select around 35 live sessions, together with a number of others that will be presented online through the organisation's learning management system to "supplement the in-person sessions and enhance the opportunities to engage for those attendees watching at home".

Presentations, it says "must be educational in nature and may not market a company's product or service".

NBAA will make its selections by 8 July.

Details can be found in the BACE education session section of the NBAA web site.

ABS Legacy fleet is coming IntuVue

In first for Europe, Czech charter operator to retrofit advanced RDR-7000 Honeywell weather radar in its Embraer jets

ABS Jets operates a mixed Embraer Legacy and Gulfstream fleet

ABS_Jets

ABS Jets is to retrofit its fleet of Embraer Legacy aircraft with Honeywell's IntuVue RDR-7000 advanced weather radar system, it was announced at the show this morning.

The Czech operator, which is the first in Europe to install the product, operates four Legacy 600 and two Legacy 650 aircraft, along with two Gulfstream G550s and one G650. It has bases in Prague and Bratislava in neighbouring Slovakia.

According to Honeywell, the hands-free operation of IntuVue RDR-7000 means pilots can "focus solely on flying, which is especially important during high-stress periods dealing with bad weather".

Additionally, the system can scan from the ground to 60,000ft and 320nm (590km) ahead, analysing storm clouds for conditions that could produce lightning, hail, turbulence or wind shear, displaying the information for the crew. This gives pilots between 6-10min to react to approaching weather conditions by diverting or alerting passengers, says the US manufacturer.

"With innovative, automated technologies that provide a more comprehensive view of the weather on any given flightpath, the RDR-7000 will allow our pilots to focus on flying," says Stefan Kukura, Embraer Legacy chief pilot at ABS Jets. "At the same time, it will increase passenger comfort and safety while helping to reduce diversion and delays."

ABS Jets's own maintenance, repair and overhaul business installed the system. "Our implementation experience will benefit us as we look to offer this upgrade to our MRO customers," adds Kukura.

Nadya Krisko, senior director, business and general aviation for Honeywell Aerospace, says the company's retrofit programme includes trade-in credits for old radar units, as well as first-year maintenance service plan incentives.

In brief...

Lucky 13 for Avfuel

Fuel supplier Avfuel has added 13 branded fixed-base operations to its network in the past year, on top of 47 contract fuel locations, 19 outside the USA.

Six of its FBO members, which together represent 35 sites, are represented on the Avfuel stand. They are Avflight, Banyan Air Service, Castle & Cooke Aviation, Duncan Aviation, Fargo Jet Center, and Overland Aviation.

Paynode doubles users

Air charter sourcing platform Avinode says its Paynode secure payment service passed the 150 weekly transactions mark in the first quarter, with the number of companies using it doubling in the past year.

The Swedish company says more than 250 charter companies are now regularly processing payments using the system, which was launched in 2016. Avinode is demonstrating Paynode on its stand this week.

"We have seen exceptional growth, particularly in the past 12 months, where we have more than doubled the number of companies registered on the platform," says Brenton Melville, payment solutions manger. "They love having the ability to send and received payments instantly at the click of a button, all within a trusted network."

Garmin's King Air milestone

Garmin is marking the installation of the 750th G1000 or G1000 NXi integrated flightdeck upgrade for Textron Aviation Beechcraft King Airs.

The retrofit programme, which was introduced in 2007, offers operators "enhanced operational benefits" on top of "significant weight savings and a lower cost of operation", says the avionics specialist.

It is available on the King Air C90A/B, 200, B200, 300 and 350 series variants of the utility twin turboprop family.

The milestone conversion was installed by Stevens Aerospace and Defense in Greenville, South Carolina, on a King Air B200C operated by the US Army.

The G1000 incorporates features such as synthetic vision technology, electronic stability and protection, geo-referenced approach charts and datalink weather.

The NXi version has enhanced flight displays, wireless cockpit connectivity, and SurfaceWatch situational awareness.

The Garmin G1000 NXi flightdeck

Garmin

The UK capital's number two business aviation airport says its twin strategy of attracting VIP travellers seeking access to London as well as long-term MRO tenants by investing in its property portfolio is paying dividends

Biggin it up

Biggin Hill says its strength is the sum of its parts

London Biggin Hill Airport

Murdo Morrison

Few images encapsulated the post-apocalyptic feel of lockdowns and their effect on aviation as those ghostly, silent terminals at some of the world's busiest airports. Yet as once ram-packed international hubs such as London Heathrow emptied of passengers and their owners fretted about their future, other, smaller air gateways, many of them not too distant, were quietly prospering. They have continued to do so even as travellers have returned in a big way to commercial aviation.

"We never shut, even at the peak of the crisis," says Robert Walters, commercial director at London Biggin Hill Airport. "Covid magnified the benefits of business aviation airports." Like many of its counterparts, Biggin Hill, a former wartime air base 18km from central London, has seen business aviation movements increase from roughly 3,500 in the first quarter of 2019 to 5,000 in the same period in 2022. The pandemic provided a kick-start rather than a brake.

Much of this is down to first-time users of business aviation. With international airline travel ironically becoming more stressful than ever as border restrictions relaxed, many individuals who could afford to opted for the ease of turning up at a private airfield and boarding an aircraft that they perceived to be a more Covid-secure environment than an airliner cabin. There were even friendly staff on hand to check any pandemic-related international paperwork was in order.

With commercial carriers withdrawing unprofitable international services – even when legal restrictions were lifted – and cancelling others at short notice for operational reasons, many of those who needed to travel for business reasons, or wanted to for leisure, discovered that they could not rely on their frequent flyer status with their favourite airline. The result

Walters: We're a diversified business with strong property portfolio

London Biggin Hill Airport

Farnborough is a copy of Gulfstream's showpiece facility in Savannah

Gulfstream

Gulfstream goes for growth at Farnborough

While Bombardier's new Biggin Hill facility will trump it – just – in size, Gulfstream's Farnborough hangar is currently the largest business aviation maintenance facility in Europe at 20,900sq m (225,000sq ft).

With room for 13 large Gulfstream jets, the building, which also houses company and customer offices, is three times the size of the site it replaced, at Luton airport. Gulfstream completed its relocation in July 2020, just after a strict UK lockdown (Luton continued to operate for another six months), so the Farnborough hangar's official unveiling did not take place until earlier this year.

The hangar is a "mirror image" of Gulfstream's flagship MRO facility at its Savannah headquarters.

With 300 employees, Gulfstream joins other high-profile residents at Farnborough – pilot training specialist FlightSafety, the airport operator itself with its distinctive curved hangars and VIP terminal, and, on the other side of the runway, the Farnborough Airshow exhibition site.

How Oxford attracts the Cotswolds set and motorsport magnates

Another UK airport that has been spending big on real estate to help attract and keep high-profile tenants is Oxford.

While Oxford does not have the proximity advantage of Farnborough and Biggin Hill to the capital, on a good day clients can reach the west end of London in little over an hour by car. In addition, the airport is on the doorstep of the Cotswolds district, where many of the UK's wealthy have homes, and "motorsport valley", centre of the country's motor racing industry.

Oxford is investing in its infrastructure, including this new hangar

Oxford Airport

Like Biggin Hill, Oxford sees helicopter shuttles as an essential part of the airport's appeal – clients can be picked up from their country houses for international flights, or connect to London's heliport in Battersea, also owned by Reuben Brothers. The airport recently opened seven helipads next to the taxiways.

James Dillon-Godfray, head of business development, also acknowledges the potential for electric vertical take-off and landing (eVTOL) aircraft to fulfil this role in the future, as well as providing training, maintenance, recharging and other support services for the emerging sector. "They are not going to be able to do this from downtown vertiports," he says.

Over the years, Oxford has been transitioning from predominantly a general aviation airport – known for its flying schools – to one more focused on larger private aircraft. While training still dominates, like Biggin Hill it has seen its business aviation traffic grow substantially during the pandemic recovery period, by almost 40% in 2021.

Attracting maintenance and other business aviation service providers is also part of its strategy. Airbus Helicopters and valeting specialist Up & Away are long-term tenants, and more recent arrivals include aircraft reseller and charter company Volare.

During 2021, the airport opened a 7,000sq m hangar, which it is renting to tenants. It will complete a second in 18 months, and has permission to build a third. A new fuel farm has opened, and a science park, on land the airport owns, is taking shape near the entrance to take advantage of Oxford University's many technology and bio-science spin-offs that need premises.

has been a boom in demand for charter services in the past 12 to 18 months, with business aviation airports a major beneficiary.

For Biggin Hill, there is another reason it is thriving. The airport has been investing heavily in its infrastructure with the aim of attracting not just business travelers but tenants, particularly maintenance, repair and overhaul providers. Privately-owned Biggin Hill may be behind dedicated rivals such as Farnborough and Paris Le Bourget, as well as Heathrow, Luton and Geneva, in terms of business aviation traffic, but it claims to have more MRO operators than any other airport.

The anchor tenant is Bombardier, which is due to open a hangar capable of housing 14 Global 7500s later this year. It will be the biggest OEM-owned facility in Europe. The structure will replace the Canadian manufacturer's existing Hangar 510 nearby, which it shares with fixed-base operator Signature, and was originally designed by defunct Qatari charter operator Rizon Jet. Bombardier's decision to build its new hangar at Biggin Hill is a "huge endorsement of our strategy," says Walters.

In turn, Hangar 510 was bought last year by Avia Solutions, a fast growing group originating in Lithuania, which also owns brands such as brokerage Chapman Freeborn, MRO outfit FL Technics, and charter operator KlasJet. That followed Avia's purchase in March 2021 of RAS Group, an aircraft painting and completions house at Biggin Hill. RAS has been rebranded JETMS Completions, coming under the wing of Avia's Vilnius-based regional jet maintenance firm JETMS.

JETMS Completions has ambitions to raise its game in business jet interiors, says managing director Keiron McNeill. He believes the UK's reputation for luxury automotive brands gives it a platform to establish a reputation for cutting edge completions. Although Avia has not laid out its plans for the building, its purchase of Hangar 510 – soon to be vacated by Bombardier – gives JETMS Completions premises to expand its capabilities and Avia to extend its business aviation MRO footprint in the UK.

The Landing will have 56 bedrooms and be pitched largely at air crews

London Biggin Hill Airport

Interiors specialist JETMS Completions was formerly Biggin Hill-based RAC

JETMS Completions

The builders are busy elsewhere at Biggin Hill. Due to open in December, as part of a £12 million ($15 million) investment, is a 56-bedroom hotel, called The Landing. It will largely accommodate overnighting crews, engineers and other professionals visiting the airport. Situated next to Hangar 510 on the perimeter of the airport, so handy is it for arriving pilots that Biggin Hill has come up with the slogan: "Touch down to head down in 10 minutes".

Although the airport toyed with leasing the hotel to a hospitality group, it has decided to run the establishment itself. However, global business aviation catering company Air Culinaire, which has a presence already at Biggin Hill, will manage the kitchen. This has a double benefit, says Walters, as captains and cabin crew will be able to discuss meal options for their VIP passengers directly with Air Culinaire chefs.

Other infrastructure plans include a third airport-owned hangar. Biggin Hill opened its second, a 6,000sq m building, in 2018. The airport's main taxiway is being resurfaced, and the instrument landing system upgraded. Castle Air, which operates a popular helicopter shuttle to central London, is expanding its rotorcraft maintenance facility, and, longer term, there are plans for a new VIP terminal to replace the existing main airport building.

Walters says the airport's combined strategy of attracting high-end passengers who want a seamless on-ground experience and easy access to London, and a growing cluster of maintenance companies by providing buildings to rent or land to build on has "proven resilient". He adds: "It's a diversified business with a strong property portfolio. The strength of Biggin Hill is the sum of its parts."

Sustainability is a constant feature of conversations this week as sustainable aviation fuels, carbon off-setting and a drive to new low-emissions aircraft all find a place in the limelight

Green light

Gulfstream is planning SAF demonstration flights with Alder Energy and the US Department of Energy's Joint BioEnergy Institute

Gulfstream

Mark Pilling

A quick glance at the conference sessions at this year's EBACE leaves visitors in no doubt about the topic of the day: sustainability. About half of all the sessions have a green focus ranging across strategy, sustainable aviation fuel (SAF), carbon offsetting, efficiency, standards, and training.

With sustainability creeping into all aspects of business flying the industry has moved from thinking about it to adopting various tactics into their day-to-day operations. EBACE is further cementing the necessity of green business for all players in the value and supply chains.

However, the sector, whether in fixed-wing or rotary operations, has a special set of challenges compared to their larger airline cousins. These arise mainly because not only is its share of aviation emissions tiny in comparison (2% of aviation's 2% total so only 0.04% of global CO2 emissions) but the irregular nature of business aviation flying makes carbon reduction plans different by design.

EBACE visitors will note that the sector has updated the Business Aviation Commitment on Climate Change (BACCC) with a promise to meet net-zero carbon dioxide emissions by 2050 (relative to 2005 levels). The International Business Aviation Council (IBAC) and the General Aviation Manufacturers Association led this change at the NBAA BACE event in October. "Our target is more aggressive than it was [it was a 50% reduction in emissions by 2050] but it is not an insurmountable one and it is a robust commitment," says Bruce Parry, senior environment manager at the European Business Aircraft Association (EBAA). "SAF will make a big contribution, and there will be some offsetting," he says.

EBAA supports the European Union's "Fit for 55" target of reducing greenhouse gas emissions by at least 55% by 2030, and its ReFuelEU regulation that will mandate increasing use of SAF for aviation during the second half of this decade. However, it is concerned that as drafted the ReFuelEU package does not include the book-and-claim mechanism, says Parry. This is because some lobby that SAF is an offset. "It is fuel, not an offset," he explains, a view ratified by IBAC.

Book-and-claim is where operators buy SAF at an airport where it is unavailable and receive credit for its supply and use at one where it is. "Our industry uses a lot more airports and there is not the infrastructure or fuel available to put it at every airport where we operate so book-and-claim is much more relevant to us," says Parry.

EBAA is lobbying the European Commission on recognising the importance of book-and-claim to the industry and on the need for a global approach to this topic to ensure consistency and give operators confidence they can account for the SAF they buy.

EBAA is lobbying Europe to ensure SAF book-and-claim comes under upcoming legislation, says Parry

EBAA

A variety of fuel suppliers and FBOs (fixed base operators) are doing book-and-claim today. "We work with an independent verification company – the Roundtable on Sustainable Biomaterials – to ensure what we book-and-claim matches so customers can be confident they get the real sustainability benefits from the SAF they purchase," explains Laura Bowden, global marketing manager at Air BP. Over the past six months, Air BP has seen a mix of airlines, OEMs and business aviation flight departments buying more SAF with the desire of locking in longer-term supply deals rather than one-off purchases, she notes.

Air BP is seeing rising demand in two areas, explains Bowden. Firstly, where mandates come in, such as in France this year that stipulate a small percentage of SAF is blended with Jet A-1. Secondly, voluntary demand where customers want to get going with SAF. "We ask what blend they want and at the current price premium what volume are

Air BP says SAF demand rising in two areas: meeting mandates and voluntary requests

Air BP

you looking for? Then we will figure out how to get it to you and where book-and-claim can come in," she says.

An important element of the conference agenda was this morning's event on "A basic guide to off-setting", with the critical tool here being IBAC EX, the Business Aviation Carbon Exchange, launched in September 2021 by IBAC and the Carbon Trade Exchange (CTX). Presented by IBAC director general Kurt Edwards and Wayne Sharp, chief executive of CTX, the session was due to discuss take-up of voluntary off-setting among business aviation operators.

Today, only the largest operators have an obligation under schemes such as Europe's Emissions Trading Scheme or ICAO's CORSIA scheme to buy offsets. So far, there is little voluntary off-setting underway with around 15 operators and airports using IBAC EX today, says Sharp. "Many see it as a cost, but it does allow operators to price their emissions footprint in their business," he notes. For instance, a mid-range business jet flight from London to Nice would only cost from $80 to $150 to be carbon neutral.

Taking the opportunity to offset now will put the industry on a strong footing to avoid being penalised by extra regulation if it takes little or no action. "The sector has the opportunity to avoid the risk of a regulatory burden and the massive 10-fold costs associated with it," believes Sharp.

With global SAF supplies estimated at less than 5% of aviation fuel demand only well-funded large operators can get meaningful quantities, whereas low-cost carbon offsets are readily available and purchased online as required, explains Sharp.

All the major manufacturers place great importance on sustainability with activities and initiatives from aircraft design and manufacturing, at production and service sites, and assisting customers.

"We strive to be good and responsible stewards of the environment," says Rexford Ofosu, project manager responsible for corporate sustainability at Gulfstream, who has been in the role for eight years.

"The key is to provide customers with decarbonisation tools such as efficient aircraft using advanced technology, to make SAF available, and provide market-based measures – offsets," explains Ofosu. "As it embeds sustainability in all facets of its operation, Gulfstream is also working with its stakeholders to gain a better understanding of Scope 3 emissions, which are those attributed to suppliers and customers," he adds.

Gulfstream has over a decade of experience in SAF signing a major deal in 2015 with World Fuel Services for use in delivery flights, a deal extended in 2020 for another five years, says Charles Etter, staff scientist/technical fellow responsible for environmental and regulatory affairs at Gulfstream.

To support the industry's drive to 100% use of SAF, Gulfstream is partnering with two producers in the research phase to use the fuel they make at 100% blends in its aircraft in the coming two years, says Etter. The first is with US firm Alder Fuels, with a flight planned for later this year. The second is with the US Department of Energy's Joint BioEnergy Institute with the aim of a SAF demo flight in 2023.

"Many of our customers are interested in sustainability, and all are at different phases of their journey," explains Etter. Gulfstream has been running virtual and in-person "Sustainability Roundtables" during and since the pandemic doing its part to spread the message. "There is still an education process needed, not only about SAF but about the whole sustainability process," he adds.

The much-debated "disruptive" technologies such as electric, hybrid electric, and hydrogen propulsion to deliver zero-emissions aircraft will come to business aviation, but it will likely take more time than in the airline world.

However, the aircraft and engine OEMs are on the case, in addition to their on-going efforts on efficiency, with increasing electrification of the engine system a likely starting place. Embraer has been at work on a family of four low-or zero-emission aircraft concepts under the Energia name. It intends to develop a nine-seater hybrid-electric model, the E9-HE, for service entry by 2030.

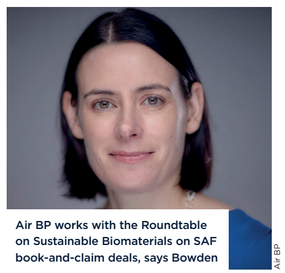
Pilatus Aircraft comes to EBACE after a busy 2021 where it delivered a record 152 units. "Without revealing any company secrets, we can confirm that we are currently focusing our efforts on composite materials, engine technology, and other technical areas too," says Ignaz Gretener, vice-president general aviation at Pilatus.

There is innovation in the advanced air mobility space on show at EBACE, for example from French start-up VoltAero, which is updating visitors on its four-seat Cassio aircraft and the electric-hybrid propulsion unit that will power it.

The helicopter OEMs are as intensely focused on sustainability as their fixed-wing cousins. As Airbus Helicopters outlines in its roadmap, the journey is starting with vehicle aerodynamics and mass improvements moving to better turbines and then an "eco-mode", each of them promising a range of double-digit improvements in CO2 emissions as the technologies arrive. These innovations are being tested on the Airbus Flightlab, a converted H130.

In later phases of the Airbus roadmap there is increasing engine electrification, hybridisation, and hydrogen. A constant benefit is that all Airbus helicopters are certified to run on a 50% SAF blend.

From SAF to technical wizardry, a green wave of sustainability innovations and actions is enveloping EBACE this year. And this is as it should be as the industry seeks to establish and further its licence to grow and operate while lowering its emissions footprint, as per the BACCC declaration.



Air BP works with the Roundtable on Sustainable Biomaterials on SAF book-and-claim deals, says Bowden

Air BP

"The key is to provide customers with decarbonisation tools", says Gulfstream's Rexford Ofosu

Gulfstream

Designing regulations for a new breed of electric urban air taxis is uncharted territory. How to recruit and train thousands of pilots is just one of many big questions the sector faces

Seeking city high-flyers

Joby anticipates a 'world where thousands of pilots are flying our aircraft every day'

Joby Aviation

Murdo Morrison

The potential market for electric vertical take-off and landing (eVTOL) air taxis is endlessly hyped, but huge technological, industrial, regulatory, and social barriers stand in the way of the vision becoming reality. Chief among them are convincing wary regulators these unproven machines are safe to certificate, and persuading a possibly even more sceptical public they are safe to fly in.

But that is not all. Massive funding will be required to ramp up production to ensure profitable unit costs. Air traffic management systems and an infrastructure of vertiports and charging terminals must be created from scratch. Then add to all that the challenge of finding and training pilots for the 47,000 urban air mobility (UAM) vehicles consultancy Roland Berger predicts will be in the skies by 2040.

The biggest dreamers among the multiple start-ups hoping to be pioneers of this brave new world envisage a future where eVTOL platforms will fly autonomously – descending to transport granny to the shops at the command of an app. However, the near-term reality will be very different, with pilots at the controls, and those probably coming from the existing pool of professional flightcrew.

"The consensus is that they will be CPL [commercial pilot's licence]-holders who will have done a type rating and have recurrent training every few months," says Simon Azar, vice-president of strategy, marketing, digital products and adjacencies, civil aviation at Canadian training company CAE, which has signed contracts with several eVTOL developers to create their training programmes.

However, if even the more-sober forecasts of the market prove correct, there simply will not be enough conventionally trained pilots to support a sector that could be bigger by next decade than business aviation is today. With demand recovering rapidly, US airlines are already warning of a pilot shortage after many older aviators exited the profession during the peak of the Covid-19 crisis.

With a forecast of 10,000 UAM aircraft in service by the turn of the decade, and three or four pilots needed to achieve the steady utilisation necessary for these fledgling operations to make money, training programmes will need to be created at speed, asserts Luiz Renato Mauad Ferreira, manager customer support at Embraer, whose spin-off Eve was an early UAM developer.

Flying a UAM aircraft could be a route to piloting an airliner

Volocopter

However, he admits that "we won't start with that number of pilots". Instead, "we will start with one and scale up very fast. In the beginning we will use pilots with experience to help us certificate the aircraft, but once we have scale we will develop specific training, and we will see the first eVTOL-trained pilots."

Urban air mobility platforms are a paradox. Every developer stresses their simplicity – Vertical Aerospace expects an 80% reduction in pilot workload compared with a current general aviation aircraft. After all, they are just one step away from autonomous aircraft. "It will be very simple for the pilot to deal with any problem and get the aircraft down," says president Michael Cervenka.

Safety challenge

Another developer suggests learning to fly an eVTOL aircraft will be like training to become a bus driver. However, these aircraft will operate in one of the most perilous environments for any pilot: above cities, and in three dimensions. Unlike a road-based public transport vehicle, in the event of trouble, you cannot just pull over, engage the handbrake, and flick on the hazard lights.

This presents a dilemma for regulators. To put it bluntly, lose control over rural Kansas, and you are probably only going to endanger the lives of those on board. Make crucial errors over downtown Chicago and the lives of dozens of ground-dwellers are at risk. Flying a UAM aircraft might be intuitive, but those in the cockpit will need to know how to cope in umpteen emergency scenarios.

CAE's Azar acknowledges this challenge. "These will be more intuitive to learn to fly than a helicopter or a regional aircraft, but in many ways the operations in urban areas will be even more complex," he says. "As with any training, UAM pilots will have to train to know what to do when things go wrong."

Andre Stein, Eve chief executive, admits coming up with a UAM training syllabus "still has a way to go". However, he says: "We have come a long way since we started down this road in 2016. Back then, there were discussions over whether we even needed a pilot. Now, there

is agreement a certified pilot will be required, but the level of training is part of ongoing discussions with regulators."

He says flying a simulator since mid-2020 has helped designers of Eve's eVTOL prototype understand the requirements. "It is a future autonomous vehicle, so it is all about simplifying workload and reducing what the pilot needs to be aware of," he says. "The fly-by-wire system takes all the hard decisions, and there is no rudder or flaps. The pilot is more of a flight manager than active pilot."

He continues: "We are on exactly the same page as the authorities when it comes to making safety the number one priority, but what is new is how that safety level will be assessed. Will the authorities be willing to embrace the OEMs' ways of ensuring safety compliance by using new tools, for instance?"

Vertical's Cervenka agrees that those behind the controls of the first eVTOL types on the market will be retrained commercial pilots. "But there is a massive opportunity to really benefit from these aircraft being much easier to fly," he says. "We will have to address pilot training that matches the capabilities of the aircraft."

The "elephant in the room", he argues, is what air traffic management protocols pilots will have to follow. If regulators impose rules similar to those for helicopters – which in most cities have to follow strict corridors, such as along rivers, for noise and safety reasons – "no eVTOL is certifiable", he says. However, he welcomes "encouraging proposals" from the European Union Aviation Safety Agency (EASA).

One of the most striking aspects of the young UAM sector has been the faith shown by established airlines in some of the developers, including Eve and Vertical. Manfred Hader, head of aerospace at Roland Berger, notes that of the roughly 8,700 published orders or other commitments for eVTOL aircraft, airlines and leasing companies make up almost a third, the largest chunk of customers.

A UAM training syllabus has a long way to go, says Eve

Eve

The interest from the likes of AirAsia, American Airlines, Azul, Finnair, Japan Airlines, United Airlines and Virgin Atlantic is often portrayed as being about diversification and improving service – airlines looking to provide end-to-end transport for premium passengers in the way that they might today with chauffeur pick-ups. However, there might be another motive.

As mentioned earlier, US carriers in particular are again struggling to find air crew after the hiatus of the pandemic, exacerbated by a Federal Aviation Administration requirement for co-pilots to have flown 1,500 hours. While the shortage is not worldwide, many airlines wonder how they will attract aspiring pilots in a global economy where competition for bright graduates is at a premium.

1,500

Flying hours required for co-pilots, under US Federal Aviation Administration regulations

One way could be to offer them the chance to attain cockpit experience flying an eVTOL aircraft. "Several airlines coming into this space have been talking about how they could use it to feed into their networks, both in terms of talent as well as operations," says Azar. "Why not help them get to their 1,500 hours flying an eVTOL?"

Eve's Stein suggests that, so long as regulators and the industry can agree on the rules, the new UAM sector "will create a pipeline of new pilots, where they start on an eVTOL and move up to a commercial aircraft". By working with airlines, developers will help to create "a natural pathway for career progression", he says.

Volocopter is one of the companies working with CAE to devise a training syllabus for pilots of its two-seat VoloCity vehicle, which it hopes will enter service in 2024. Under the agreement, Volocopter is purchasing a simulator from CAE, which will be used to certificate its pilot training programme. Meanwhile, CAE will create courseware for later flightcrew.

"Requirement sets are currently in development between EASA and us. This will include an initial path for existing pilots to obtain a type rating, building on either fixed-wing or rotary aircraft licences," says the German company. "Once we have this, we will work with CAE to develop the theoretical and practical training for future pilots."

Volocopter adds: "We have a handful of test pilots registered with the authorities who are allowed to fly the Volocopter. That number will grow once our commercial operations start."

Vertical expects an 80% reduction in pilot workload compared with today's GA aircraft

Vertical Aerospace

Thousands a day

CAE will also develop pilot training devices for US start-up Joby Aviation, which intends to both develop and operate its own eVTOL aircraft. "We look forward to a world where thousands of Joby pilots are flying our aircraft every day," says Joby's head of air operations and people, Bonny Simi.

CAE's rival FlightSafety International is also getting involved in the sector, in a move tied with fellow Berkshire Hathaway company NetJets' decision to purchase up to 150 eVTOL jets being developed by German company Lilium. NetJets will work with Lilium to come up with a business model, starting with an operation in Florida.

For its part, FlightSafety will develop training courseware as well as "mixed reality" training devices for Lilium. "Our focus on technology and adaptive learning will help prepare aviation professionals with the highest levels of expertise to support operation of the Lilium Jet," says Brad Thress, chief executive of the US training provider.

Other than a few tentative flight tests of prototypes, few eVTOL aircraft have even yet got airborne. But in just a few years, if forecasts prove correct, the skies could be full of them, and the sector a major employer of newly qualified aviators. Azar acknowledges many challenges remain, but says establishing and qualifying instruction programmes is a priority. "The industry has left the station," he says. "For us to get to the next one, we are going to need a lot of trained pilots."

The head of the Brazilian airframer's executive jets division has high hopes for Europe as its best-selling types continue to thrive in the fractional market and elsewhere

Embraer punches up

Murdo Morrison

Michael Amalfitano is convinced the recovery in European business aviation is about to get into full swing, despite the region lagging North America. The president and chief executive of Embraer Executive Jets predicts the market here will soon match the growth levels the other side of the Atlantic has seen in the past 12 months.

"We are seeing corporates coming back, as they have in the US," says Amalfitano, speaking to FlightGlobal a few days ahead of the show. "It is also being driven by first-time users and buyers. They can't find pre-owned aircraft and most of them want the current technology and a sustainability platform, so they are coming to our brand in a big way."

One of the Brazilian airframer's most important customers, Flexjet, late last week confirmed it was adding three Praetor 600s to its European fleet this year, citing a 180% increase in flight activity in the region in the first four months. It is part of an order for 64 Embraer aircraft the Directional Aviation-owned fractional placed at the 2019 National Business Aviation Association convention.

Embraer also announced at the show this week that it was now offering Ka-band connectivity as a retrofit across its Praetor and Legacy families – the Legacy 450 and 500 pre-date the Praetor 500 and 600. Flexjet is the first to adopt the modification, on its European fleet of Legacy 500 types. Embraer already offers Ka-band as a factory option on its two Praetor models. The super-midsize Praetor 600 and the Phenom 300E light jet remain the stand-out performers for Embraer, which also offers the midsize Praetor 500 and the entry-level Phenom 100EV, alongside the now out-of-production regional jet-derived Legacy 650 and Lineage 1000. The Phenom 300E, and its predecessor the Phenom 300, have been the best-selling light jet for more than a decade.

The company is showing a Praetor 600 and a Phenom 300E on the static at Geneva. "We have our best one-two punch at the show," says Amalfitano. Both types have done well in the fractional sector. At last October's NBAA convention, Embraer signed with Flexjet's main rival NetJets for 100 Phenom 300s, almost doubling the Berkshire Hathaway-owned company's fleet of the light jet.

Embraer delivered 35 executive jets between January and March, its strongest first quarter since 2016, with backlog expanding by 12%. Amalfitano says the airframer will ship 100 to 110 aircraft this year, and says supply, rather than demand, is the main brake on it delivering more. In common with the rest of the industry, Embraer and its vendors are wrestling with raw material shortages.

Embraer also this week announced it was partnering with rating system provider 4Air to offer its customers the opportunity to offset their use of carbon from flights. Customers who enroll on Embraer's support programme will receive 25h of complimentary carbon offsetting, after which they can negotiate further deals with 4Air.

So where does Embraer go now in terms of its product journey? While the Legacy 600 and Lineage 1000 were the regional and military aircraft manufacturer's route into business aviation in the noughties, the company's focus has since shifted to smaller gauge types. Will it eventually try to compete with Bombardier, Dassault and Gulfstream in the long-range, large-cabin segments?

"We're not a me-too player," Amalfitano insists. "Everything you have seen Embraer do has been disruptive, so when you see us going somewhere it's going to be a disruptive product." While he does not rule out a larger aircraft at some point, he says Embraer would only enter that space if it could deliver "something completely new to the marketplace".

Instead, he hints, Embraer's focus is likely to be at the "bottom of the market, where there is more activity". Embraer's investment in urban air mobility (UAM), through its Eve spin-off, gives the company "an opportunity to start all over", he says. Eve – which remains 90% owned by Embraer after a share flotation – is developing a four-person electric vertical take-off and landing platform.

Embraer is famously the only new entrant to break into the aerospace market in a major way in more than half a century, after the business was launched as a state enterprise in 1969. The company was dealt a blow when Boeing pulled out of a planned merger with its regional jet division at the start of the pandemic.

It has left the Brazilian company focused on its three markets of commercial, military and executive aviation, where its other products include the E2 regional jet family, the C-390 military airlifter and the Super Tucano turboprop trainer, but without Boeing's billions to help develop new products. However, when it comes to innovation, Embraer's ability to surprise the industry is unsurpassed.

"In 52 years, we have certified 30 aircraft," says Amalfitano.

In UAM, it wants to do much more than simply design an air vehicle, as a host of other developers are doing. "We are working on the whole holistic solution around ATM [air traffic management], maintenance and training. We are taking that 52 years' of experience but with a start-up mentality," he says.

Amalfitano: In 52 years, we have certified 30 aircraft

BillyPix

Learjet epitomised style, speed and sheer sexiness for celebrities and corporate high-flyers in the 1960s and onwards. After production ended this March, we look back at the brand's six-decade legacy

The death of King Lear

Murdo Morrison & **Jon Hemmerdinger**

One of the most revered brands in business aviation ended six decades of production when Bombardier delivered the final Learjet 75 on 28 March. US company Northern Jet Management became the final customer for a line of aircraft that became synonymous with the glamour of the emerging private aviation segment in the 1960s, but which, by the 21 century had found itself competing in an increasingly congested light-jet market.

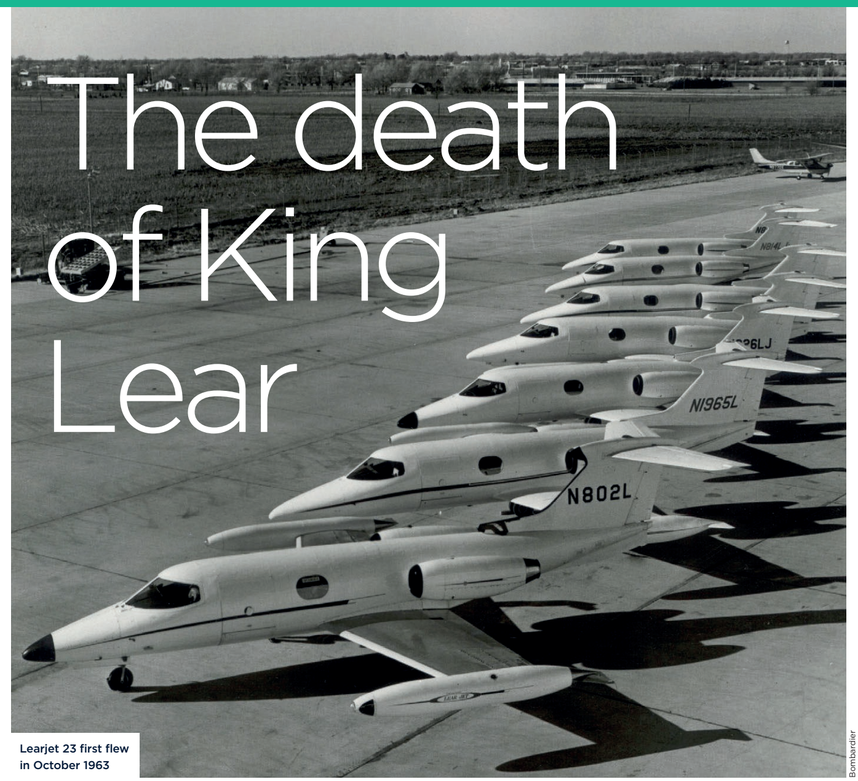
Bombardier announced its decision to shutter Wichita-based Learjet in February 2021, although the Canadian manufacturer has stressed its ongoing commitment to the city by moving its US headquarters there and turning the facility into a centre for flight testing as well as special mission conversions and defence industry support. It will also provide aftersales support for the roughly 2,000 Learjets still flying, as well as sister Challenger and Global families.

More than 3,000 Learjet aircraft were produced between 1963 – when entrepreneur Bill Lear established his first factory in Wichita – and 2022, although production had dwindled to about 20 a year in recent years. Rumours had surrounded the fate of the brand for several years, and funding the Learjet 85, together with Bombardier's wider financial problems after the ill-fated development of the CSeries airliner, sealed its fate.

Lear launched his sleek and stylish Learjet 23 at the beginning of what was arguably aerospace's most creative post-war decade. From the space race to supersonic transports, the Boeing 747 to vertical take-off fighters, engineers were dreaming big. And, in an era of increasing personal wealth as well as great military and industrial competition – not just between West and East, but between the USA, France and the UK – governments and investors were happy to bankroll those aspirations.

The Learjet 23 was the only US contender in a trio of types – with France's Dassault Falcon 20 and the UK's Hawker Siddeley HS125 – that over a few months between 1962 and 1963 took to the skies to usher an era of fast, comfortable and private transport for those companies and individuals who could afford them. Of all the brands that emerged at the time, Learjet, along with Gulfstream, has perhaps endured longest in the public consciousness and become synonymous with the sector.

Today, the Learjet name may command recognition among those who know little about aviation, but it ended up as one of five brands competing in the broad light jet segment, including several new players that have entered the market this century, such as Embraer, Honda and Pilatus. However, in the 1960s and early 1970s it would have been difficult to overstate the sheer star appeal of the fast and stylish Learjet 23. Frank Sinatra was one of its first customers, and for years it was the favoured mode of transport for Hollywood celebrities.



Learjet 23 first flew in October 1963

Bombardier

More than 3,000 Learjets were produced in total

Bombardier

Born in Hannibal, Missouri in 1902, Bill Lear failed at high school but became a serial risk-taker and inventor, making money during the Second World War. In 1960, he began working with Swiss-based engineer Dr Hans-Luzius Studer on a business jet version of Studer's FFA P-16, a supersonic fighter that never entered service. Abandoning plans for a Swiss factory, in 1963 he set up the Lear Jet Corporation in Wichita, home of Cessna and Beechcraft. The Learjet 23 flew in October that year.

Two months later, *Flight International* approved of the "sleek compactness" of the six- to eight-seat twinjet in a piece headlined "Car comfort, fighter speed", noting that what it lacked in cabin space compared with other fledgling business aircraft it made up for in pace. The General Electric CJ610-1-powered type featured swept wings and integral wing and tip tanks that gave it a 1,600nm (2,960km) range. We reported that Lear planned to be building 10 Learjet 23s a month by 1964.

In 1967, the Gates Rubber Company acquired a majority stake in the company, although Lear, by now approaching 70, remained on its board until 1969. By the time of the first flight in 1971 of the Garrett FTE731-2-powered Model 25 – later the Learjet 35 – the firm had

All-composite Learjet 85 was an ambitious attempt to broaden the range in the 2000s

Bombardier

The Learjet 31A was one of several successful types launched by the Wichita-based airframer

Bombardier

Learjet 75 was the final variant in production

BillyPix

become Gates Learjet. In 1975, the company delivered its 500th model, going on later that decade to launch the Learjet 28 (a re-winged version of the Learjet 25), and the midsize Model 54/55/56 prototype.

The 1980s witnessed a move into producing parts for the Space Shuttle programme, a short-lived relocation to Tucson, Arizona, and a further acquisition that saw the company revert to the name Learjet Corporation, although its new parent soon filed for bankruptcy. In 1990, Learjet became the latest business to be scooped up by the fast-expanding Canadian combine Bombardier, which had recently bought Canadair and Northern Ireland's Shorts, and would later add de Havilland.

Flight International reported in July that year that Learjet would remain an autonomous subsidiary of Bombardier, with its management team in place, although the Canadian outfit planned to establish a new flight-test centre for all its products at the Wichita site. Bombardier chairman Laurent Beaudoin said that production of Learjet's then current models – the 31, 35A and 36A light jets, together with the larger 55C – would continue as "niche" products within the wider Bombardier range.

During the 1990s, the Learjet 60 (an evolution of the Learjet 55) and all-new Learjet 45 flew for the first time. Around the time it was preparing to launch the CSeries, a bullish Bombardier also announced in 2007 the all-composite Learjet 85, an ambitious project that involved outsourcing specialist fuselage production to Grob in Germany. The complexity of developing the Learjet 85, together with Bombardier's growing cash crisis, saw the programme cancelled in 2015.

Despite attempts to reinvigorate what had become a one-aircraft range, with the launch of a Learjet 75 Liberty variant in 2019, the move to end production surprised few industry watchers. "There were telltale signs leading to this decision for years," says Brian Foley of consultancy Brian Foley Associates. "There were no real enhancements to the Learjet line after 2013, when the Learjet 40XR and 45XR were tweaked to make the Learjet 70 and 75."

Other lost brands of business aviation

These are some of the families or types that pioneered new segments or were highly successful in their own right, but are no longer being produced:

Lockheed JetStar
While Lockheed Martin remains one of the biggest names in aerospace and defence, Lockheed's days as a business aviation badge are long over. The Lockheed JetStar was in production from the early 1960s until the late 1970s and some maintain the four-engined, 10-passenger type was the first true business jet. Elvis Presley and Frank Sinatra were among celebrity JetStar owners.

Sabreliner
The North American and later Rockwell Sabreliner was a midsize jet developed for both military and business use in the late 1950s. After a number of civilian models, from the Series 40 to the Series 80A, production was halted in 1981.

Hawker
Hawker Siddeley was behind another 1960s-era business jet – the HS125 – which evolved into the Hawker 1000 under Raytheon ownership in the 1990s. The Hawker family – the 400XP and the super-midsize Hawker 4000 – continued to be produced until shortly before Hawker Beechcraft went into Chapter 11 bankruptcy protection in 2012. Textron Aviation bought the Hawker and Beechcraft brands in 2014, but Hawker production was never restarted.

Grob SPn
Grob continues as a manufacturer of trainer aircraft, but the Bavarian company briefly dipped its toes into business aviation under then-owner South African entrepreneur Niall Olver. The all-composite Grob SPn, unveiled and flown in 2005, was one of a flurry of light and very-light jets to hit the market in the mid-2000s. As with many of its contemporaries, the programme was cancelled in 2008 when Grob fell into insolvency. Four prototypes were built, but none entered service.

Adam
Another start-up from the noughties that failed to survive the financial crisis, Colorado-based Adam Aircraft's range comprised the A500 piston twin and the A700 very-light jet. Seven A500s – based on an original design by Burt Rutan – entered service, but the A700 never made it to production.

Eclipse
If founder Vern Raburn's vision had come true, the skies would be full of Eclipse 500s and their successors by now. The former Silicon Valley executive planned to mass produce the original very-light jet in the early 2000s, offering them to early adopters for just $2 million a time.

Eclipse Aviation failed in 2008, and, although the Eclipse name has survived under successive companies, Raburn's dream of a brand that would disrupt general aviation came to nothing.

Lockheed JetStar

James Mellor/FlightGlobal

Hawker

Beechcraft

Sabreliner

USAF

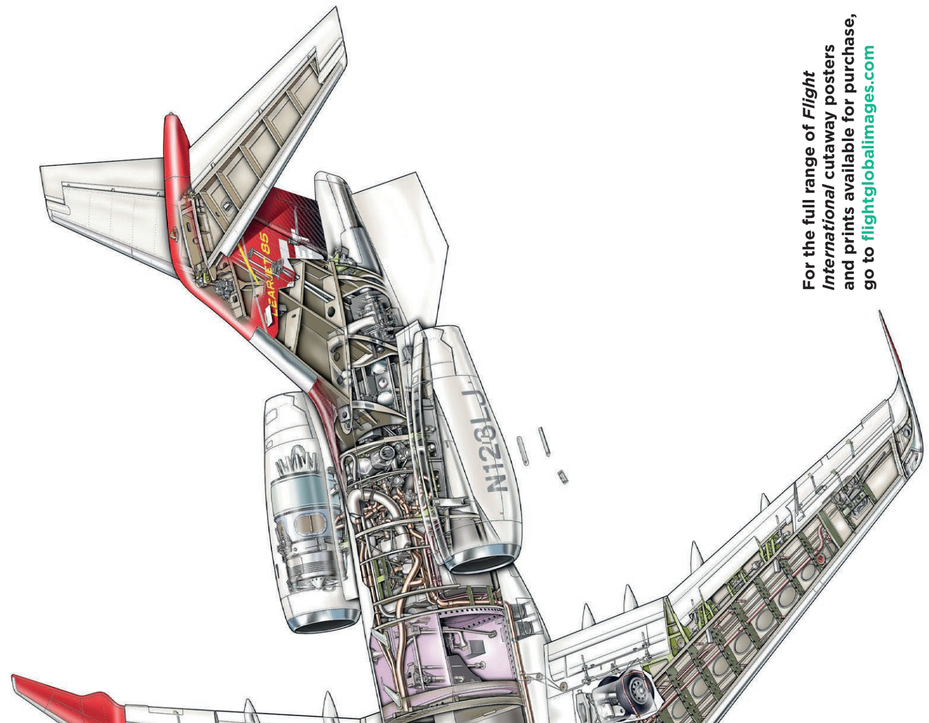
Grob SPn

BillyPix

Eclipse

Eclipse

Bombardier Learjet 85



The brand-redefining, all-composite midsize jet was the last all-new type launched by the Wichita manufacturer, and with the programme cancelled in 2015 before certification, arguably one of the nails in the coffin of the Learjet name. Our cutaway was originally published in 2009, two years after the aircraft was launched.

For the full range of *Flight International* cutaway posters and prints available for purchase, go to flightglobalimages.com

GO BEYOND

BUSINESS AVIATION

SETTING THE BUSINESS STANDARD. THEN SOARING ABOVE IT.

NEXT-GENERATION TECHNOLOGY FLYING NOW.

Pratt & Whitney's dynamic portfolio of engines isn't just leading the way in business aviation—it's transforming the industry. The revolutionary PW800 exceeds standards in performance, fuel efficiency and availability to comfortably and quietly deliver a flying experience unlike any other. Today's innovations moving you toward tomorrow's solutions—it's how we do business.

DISCOVER OUR INDUSTRY-LEADING LINEUP AT **PRATTWHITNEY.COM**