



**This April 2024 issue covers developments during February and March. The next Ishka SAVi Extra is due in June 2024.**

The developments in this document comprise updates and news coverage published by Ishka SAVi in the past two months as well as other relevant announcements not previously covered. For feedback and news tips, please email [savi@ishkaglobal.com](mailto:savi@ishkaglobal.com)

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## SUSTAINABLE FINANCE

**- For developments on Sustainable Finance involving lessors, see Lessors and Asset Managers section -**

**Aviation-inclusive Shanghai Taxonomy published** – China’s first transition finance taxonomy was [published](#) in early February, having debuted through a [Spring Airlines loan in January 2024](#). Ishka understands the document, available to download via the [SAVi Resource Library](#) (see: *Shanghai Transition Finance Taxonomy (Trial) (in Chinese)*) contains aviation criteria on page 7 of the PDF version (Page 10 of the Word version). The Shanghai Transition Finance Taxonomy (Trial) (approximated translation of its original title: 上海市转型金融目录 (试行)) was announced by the Shanghai Municipal Financial Regulatory Bureau at the end of December 2023 for introduction in January 2024, but was still unpublished as of January 2024.

**Twenty-four banks have now set 2030 aviation emissions intensity targets** – As many as **24 major lenders** have now set **2030 aviation emissions intensity targets**, and a further nine are expected to announce aviation targets soon, [new Ishka SAVi research](#) published in mid-March found. The findings are the result of Ishka’s analysis of 80 global banks and their sustainability reporting - 15 more than a sample analysed in July 2023. Since the July 2023 update, Ishka identified 10 new lenders with aviation emissions intensity targets, most of which were unveiled in the second half of 2023 and early 2024. The 24 banks with aviation decarbonisation targets are aiming to reduce the emissions intensity for their aviation lending portfolio by an average of -28% by 2030 versus 2019 to 2022 baselines.

**New NZBA criteria includes capital markets activity in decarbonisation targets** – Incidentally timed with Ishka SAVi’s latest analysis of [emissions intensity targets for aviation by global lenders](#), the **Net-Zero Banking Alliance (NZBA)** [published](#) the second version in mid-March of its *Guidelines for Climate Target Setting for Banks*. The [revised guidelines](#) fulfil a three-year revision requirement set in 2021. One of the most notable updates is the requirement for new or revised sector decarbonisation targets (and all existing targets by November 2025) to also cover capital markets arranging and underwriting activities (both equity and debt). NGO BankTrack, which focuses on banks and the activities they finance, [said](#) the change is “positive” given that “for many banks [capital markets offerings] forms a key part of their portfolio.” As Ishka understands it, the change effectively means that NZBA-member banks with significant aviation activity will not only have to report emissions intensity for their lending activity, but also for capital markets clients including airlines and lessors.

## SUSTAINABLE AVIATION FUEL (SAF)

**-- For details on SAF policy and regulation, see ‘Policy and Regulation’ section below --**

**-- For any updated related to lessors, see ‘Aircraft lessors and asset managers’ section below --**

**In annual A4E gathering, European airline CEOs plea for SAF support** – Major **European airline CEOs** on 20<sup>th</sup> March [reiterated their calls](#) on the EU to offer more government support to incentivise the scale-up of SAF production and usage. “In the US, the SAF production is highly incentivised. We need those solutions here in Europe,” Lufthansa CEO Carsten Spohr said at **the Airlines for Europe (A4E) Clean Aviation Summit** in Brussels, according to *Euractiv*. Currently, “90% of the investment in new plants of SAF is done in the US,” Luis Gallego, CEO of International Airlines Group (IAG), which owns British Airways among other airlines, told the forum. Gallego complained that “we don’t have enough SAF to comply (with the EU directives) and we don’t see construction of plants happening now.” The 17 member airlines also signed a [joint pledge](#) committing to creating a sector that is “connected, dependable, modern, more sustainable, and available to all.” Pre-empting some of those calls, **European Climate Action Commissioner Wopke Hoekstra** in his [speech](#) at the summit touted “easier permitting and support” for SAF projects under the Net-Zero Industry Act proposal, but also called on producers and airlines to “get together” to ensure demand meets planned supply. Hoekstra also made a call to work closer with European airlines to deliver a joint decarbonisation roadmap. “Let’s set up together an Aviation Climate Roadmap. This is a tool under our European Climate Law. It’s a dual commitment from industry and regulators to reach identified climate goals,” Hoekstra declared. In parallel to the summit, one of A4E’s major, **Air France-KLM**, also published a report on its [EU policy priorities](#) for the 2024 to 2029 period after the upcoming June 2024 European election, which includes the airline’s policy positions on several different issues, including sustainability policies like fuel taxation, non-CO2 effects, or SAF. Similarly, **Lufthansa Group** as part of its [Policy Brief Special February 2024](#) laid out key priorities after the incoming election.

**Reports: Sweden fails to meet 2023 SAF mandate** – Quantum Commodity Intelligence [reported](#) on 16<sup>th</sup> February that Sweden – one of a few European countries with a SAF mandate predating the introduction of the EU-wide mandate in 2025 – failed to meet its 2.6% GHG-based SAF mandate in 2023. Fuel suppliers Air BP and World Aviation Services were among those paying a reported combined near SEK70 million (\$6.3 million) in non-compliance penalties. The penalty for missing the SAF mandate is currently set at SEK 6 (\$0.57) per kgCO<sub>2</sub>e and market sources reported to Quantum in 2023 that obligated parties are willing to pay above this level for 2024 deliveries to ensure to not miss the mandate. Ishka notes that SAF production in 2023 lagged estimates for the year due to unexpected issues by SAF producers vying to ramp-up output. This was acknowledged by several airlines at Ishka’s ESG conference in March 2024: [‘Ishka ESG: SAF target hurdles become clearer after 2023 production ‘setbacks’](#).”

**New WEF report on SAF** – The World Economic Forum (WEF) on 13<sup>th</sup> March [published](#) a 33-page insight report titled *Scaling Up Sustainable Aviation Fuel Supply: Overcoming Barriers in Europe, the US and the Middle East* in collaboration with global management consulting firm **Kearney**. The report provides a comprehensive set of key actions that stakeholders along the entire aviation value chain should take to move towards 10% SAF by 2030 and subsequent sector decarbonization by 2050. Among other things, the report ([page 9](#)) includes a comprehensive and updated map of SAF policy around the world.



Source: WEF

**First e-SAF commercial-scale facility begins operation** - Infinium [announced](#) on 21<sup>st</sup> March it has begun operating the world's first commercial scale facility making drop-in ready electrofuels (**eFuels**) in Corpus Christi, Texas. The project, known as Project Pathfinder, makes fuels from captured CO<sub>2</sub> and green hydrogen derived from renewable power in a patented process, including eSAF.

**Top market players Sasol and Topsoe team up in SAF venture** -

South African energy giant **Sasol** and Danish SAF catalyst leader **Topsoe** [announced](#) on 14<sup>th</sup> March the launch of a joint venture, **Zaffra**. Headquartered in Amsterdam, Zaffra is "set to become a key player in the aviation industry, focusing on the development and delivery" of SAF. Zaffra will be led by Shell Aviation's former president Jan Toschka.

**Cathay Pacific and Emirates continue SAF support** – Two separate developments supportive of the SAF scale-up in early February brought into focus airlines outside of Europe and North America. In Hong Kong, **Cathay Pacific Group** was among the 13 founders [announcing the launch](#) of the Hong Kong Sustainable Aviation Fuel Coalition (HKS AFC), convened and chaired by the Business Environment Council (BEC). The multi-stakeholder coalition seeks to support the Hong Kong government's intention to promote the supply of SAF and grow Hong Kong as a regional SAF hub. Meanwhile, **Emirates** [joined](#) a UK cross-sector cluster aiming to develop a SAF plant with an estimated fuel production capacity of 200,000 tonnes per year which could be delivered through pipelines to Heathrow and Gatwick, two of Emirates' largest destinations.

**IAE V2500 tested at 100% SAF** - IAE International Aero Engines AG (IAE) [announced](#) on 18<sup>th</sup> March it has successfully tested the **V2500 engine** with 100% SAF at MTU Maintenance Hannover, Germany. IAE is a multinational consortium comprised of **Pratt & Whitney**, Pratt & Whitney Aero Engines International, Japanese Aero Engines Corporation and MTU Aero Engines. The V2500 engine, which was certified for entry into service in 1988, currently powers the Airbus A320ceo Family aircraft and the Embraer C-390 Millennium. The HEFA SAF was provided by Neste.

**Breakfast of SAF champions: Heathrow initiative sparks greenwashing row** – An unusual initiative by **Heathrow Airport** has drawn interest for its creativity and its April Fool's potential. [Labelled](#) a "first of its kind breakfast", *The Fly Up* (a play on words on fry-up, or an [English full breakfast](#)) has become the latest culinary offering of renowned chef Heston Blumenthal's The Perfectionists' Café in Heathrow Terminal 2. The airport says this breakfast helps to "create awareness" of SAF, as only 14% of surveyed travellers have heard of it. Heathrow is working with waste management service Quatra to "collect, clean and recycle the used cooking oils from the Fly Up breakfast," which can be transformed into biofuels including SAF. However, the idea that a breakfast serving can have any meaningful impact on SAF production is not for everyone. NGO A Free Ride has [called](#) *The Fly Up* breakfast "greenwash" and alluded to an [analysis](#) by the **Royal Aeronautical Society** published an analysis that estimated that 357,143 portions of chips would be needed to fuel a transatlantic Boeing 787 flight with neat SAF – or 1,818 plates of chips per passenger. **Transport & Environment (T&E)** UK policy manager Matt Finch also [pointed out](#) that UK UCO collection is nothing new, most of it goes to road biofuels, and domestic UCO only accounts for 7% of the UK's requirements today. Finch, however, concedes that Heathrow's ambition to increase knowledge about SAF is "admirable."

**SAVi SAF Tracker update** – In the past two months nine new SAF agreements were announced. Access these and other SAF deals through Ishka SAVi's [SAF Tracker](#).

The deals include the largest-ever **PtL SAF offtake agreement**, [announced](#) by **International Airlines Group (IAG)** on 28<sup>th</sup> February with US-based e-SAF (power-to-liquid) producer Twelve. The 14-year agreement to supply 785,000 tonnes of e-SAF means IAG has now secured one-third of the SAF needed to reach its 2030 target, the airline group announced. Deliveries are expected to begin "as early as" 2025 from SAF produced at Twelve's test facility in Washington State. The IAG-Twelve deal is over five times larger than the previous title-holder for the largest PtL offtake agreement – Norsk e-Fuel's deal to supply 140,000 metric tonnes of SAF to Norwegian and Cargolux, also announced earlier this year.

## POLICY AND REGULATION



### Deal reached on long-awaited Single European Skies (SES) with 'charges' to discourage emissions -

The Council of the EU (headed by ministers from member states) and the European Parliament on 6<sup>th</sup> March after a [near-17-hour trilogue](#) announced a [provisional agreement](#) on the reform of the Single European Sky, including proposal for the recast of the **Single European Sky regulation (SES 2+)**. A list of key elements of the provisional agreement can be found in the [announcement](#) and an [analysis](#) of the final compromise text was released on 22<sup>nd</sup> March. On the emissions front, the European Parliament transport committee [notes](#) that “under the new rules the Commission will adopt EU performance targets on capacity, cost efficiency, climate and environmental factors for air navigation services (ANSPs)” which will be reviewed every three years. ANSP charges levied on airlines could “encourage them to be more environmentally friendly, for example by using the most fuel-efficient available routing or alternative clean propulsion technologies.” The provisional agreement is now subject to approval by the Council and the Parliament. The much-delayed Single European Sky II (SES2+) initiative is touted as an enabler of up to 10% emissions reductions through operational efficiencies. Progress on the file has been a recurrent demand by the aviation industry over the past decade. The leading European airline association, **Airlines for Europe (A4E)**, which not long before the SES2+ agreement [warned](#) against carelessly “rushing” the file ahead of the June 2024 European elections, [noted](#) that “on first look” it seems “still some way off.” Two days earlier on 4<sup>th</sup> March, A4E published an [analysis](#) on the set of compromises of SES2+ being discussed by policymakers which it [said](#) “either dilute any reforms or result in an outcome that is worse than the current situation.” Among the compromises, A4E claimed that a preference for “shortest routes” over “efficient trajectories” would increase airline fuel use and emissions. On 6<sup>th</sup> March, the European Regions Airline Association (ERA) [called](#) the provisional agreement “disappointing” and a “missed opportunity” for European regional airlines. On 21<sup>st</sup> March **IATA** noted that the compromise on SES 2+ would “prevent the SES from delivering on its promise, dent European competitiveness, and leave much-needed emissions savings unrealised.” “Failure. All we have to show for the years of SES2+ discussions to unite Europe’s skies is a grubby deal [...] the environment and airlines must prepare to pay with delays, higher costs and unnecessary emissions. It’s a deal that should not be done,” remarked Willie Walsh, IATA’s Director General.



End of the trilogue negotiation.

Source: Niels Timmermans via Twitter

**EU recommends 2040 target at 90% emissions cut, up from 55% by 2030** – The **European Commission** in early February [recommended](#) a 90% net greenhouse gas EU emissions reduction by 2040 compared to 1990 levels, in line with recent scientific advice and the EU’s commitments under the Paris Agreement. The recommendation will reinforce emissions management measures, reaffirm the need to fully implement Fit for 55 legislation (such as ReFuelEU Aviation), and compel the next Commission (after the June 2024 election) to put forward legislative proposals on a 90% target basis. The target will now be discussed with the European Parliament and the Member States. The main transportation-focused environmental NGO in Europe, **Transport & Environment (T&E)**, broadly [welcomed](#) the recommendation making it “historic” and underlining that it gives “investment certainty” to transport stakeholders including airlines. However, it criticised the lack of specificity of ambition for aviation in the 2040 target recommendations.

**EU includes SAF in IRA-rivalling NZIA** – The **EU Council** and the **European Parliament** on 6<sup>th</sup> February [reached](#) a provisional deal on the regulation establishing a framework of measures for strengthening Europe’s net-zero technology products manufacturing ecosystem, better known as the ‘net-zero industry act’ (NZIA). The regulation aims at boosting the industrial deployment of net-zero technologies needed to achieve EU’s climate goals, using the strength of the single market to reinforce Europe’s leadership in industrial green technologies. The consensus document – which is likely to become law – [includes](#) “sustainable alternative fuels” including SAF in its ‘strategic net zero project’ scope. The inclusion of SAF has been [welcomed](#) by aviation trade associations in Europe, although they remain steadfast in calling on “policymakers to go further to ensure Europe develops a world-leading SAF industry.”

**EU expands list of SAF bio feedstocks** - A **European Commission** delegated act [approved](#) on 14<sup>th</sup> March added a number feedstocks (crops on severely degraded land and some intermediate crops) to the Commission’s list of permitted feedstocks for advanced biofuels (Annex IX, Part A of the Renewable Energy Directive) exclusively for aviation biofuels. The “surprise” inclusion of these feedstocks sparked [criticism](#) from the **European Waste-based & Advanced Biofuels Association (EWABA)** for altering the “level-playing field” across transportation sectors. A little more pleased, though probably not entirely, may be the **European Renewable Ethanol (ePURE)** association which in February [launched](#) legal action against ReFuelEU Aviation for excluding crop-based biofuels from the definition of SAF. For a recap of ReFuelEU Aviation (the EU’s chief SAF legislation), a [recording](#) of a European Parliament 6<sup>th</sup> March panel involving ReFuelEU chief rapporteur MEP Jose Ramon Bauza Diaz and other key stakeholders is available to view. Meanwhile in a separate SAF feedstock development, the **UK** on 16<sup>th</sup> February [announced](#) that **recycled carbon fuels (RCFs)** would be supported under the Renewable Transport Fuel Obligation (RTFO) following a previous consultation. The RTFO sets volume-based targets for the supply of renewable fuels for use in UK transport which are met through a certificate trading scheme. The government said RCFs are a key potential source of SAF and hopes supporting them will result in investment in RCF-derived SAF.

**European Parliament takes aim at offsetting** – A draft for an upcoming **EU Green Claims Directive** [received](#) a favourable vote on 12<sup>th</sup> March at the European Parliament with 467 votes to 65 and 74 abstentions. The [draft](#) will shape the Parliament's position on the rules on how firms can validate their environmental marketing claims, including on carbon offsetting (a common practice by airlines and one often offered as an opt-in for passengers). The file will now have to be followed up by the new Parliament after the European elections that will take place in June 2024. In a press note, the Parliament said MEPs specify that companies could still mention offsetting schemes "if they have already reduced their emissions as much as possible" and use these schemes "for residual emissions only." The full ramifications of the draft directive for airlines remain to be explored, but it appears it could limit how offsets for air travel could be marketed.

**Spanish governing coalition agrees to ban short-haul flights with rail alternatives** – The two political parties of Spain's ruling coalition, PSOE and Sumar, on 21<sup>st</sup> February [agreed](#) to reduce short-haul domestic flights between city pairs with rail alternatives of under two-and-a-half hours. The ban excludes flights to hub airports offering onward international route connections, such as Madrid and Barcelona. According to *Europa Press*, which had access to a copy of the agreement, the agreement compels the government to introduce a measure to enact the ban. According to an [analysis](#) by OAG, the highest profile route that might be affected is the **Madrid - Valencia market** where train services take just under two hours. However, OAG points out that three-quarters of bookings are connecting through Madrid.

**Dutch aviation dealt court blows in noise and greenwashing cases** – Separate court rulings in the Netherlands on 20<sup>th</sup> March dealt blows to the country's aviation industry, with one ordering the government to cut noise pollution at Amsterdam Schiphol Airport and another confirming KLM ads accused of greenwashing were indeed misleading. The first case (noise) was brought by a group of people who live close to the **Amsterdam Schiphol Airport**. In the judgment, the court [reportedly said](#) the government had not struck a fair balance between Schiphol's economic interests and the problems it causes for people on the ground. The court said it could not explicitly order the government to limit flights at Schiphol, but that such **a cut could be the ultimate result of its verdict**. The second case (**greenwashing**) was brought in 2022 by Dutch campaigners with the support of environmental NGO **ClientEarth** who argued that KLM's advertising misled the public by giving the impression that the airline is tackling climate change despite plans for air traffic growth. It also challenged KLM's carbon offsetting marketing. [According to ClientEarth](#), the 20<sup>th</sup> March judgment declared KLM was in fact "acting unlawfully by using misleading advertising" and it says it "sets a precedent for all companies promoting net zero commitments, with ramifications across the international aviation sector." Because KLM had retracted its ads and because the court found a ban on similar claims too uncertain it did not see the need to issue any remedies. An unofficial English translation of the court ruling provided by the NGO is [available here](#).

**EU's Clean Aviation joint undertaking will soon need more funding** - The **Clean Aviation joint undertaking** will need to unlock additional funding as it prepares to enter a new phase to bring its research closer to market, executive director Axel Krein said on 11 March according to a [report](#) by *Science Business*. The EU's industrial partnership for sustainable aviation launched its first calls in 2022, with the focus on identifying concepts and developing technologies. Now it is preparing for the flight demonstration phase, and is due to launch the next large call in early 2025. "Those big demonstrations are quite euro intensive," Krein told the **Clean Aviation Annual Forum** in Brussels. "We are facing some budget challenges to support all those promising new aircraft technology concepts." The partnership, which replaced the Clean Sky 2 joint undertaking, is dedicated to developing hybrid electric regional aircraft, ultra-efficient short and short-medium range planes, and hydrogen-powered aircraft.

**Sweden minister declares end of 'flight shame' with \$97m investment** – Sweden's Infrastructure Minister Andreas Carlson in February [declared](#) an end to the 'flight shame' movement which began in Sweden. Carlson suggests it is no longer relevant in light of the airline industry's adoption of more sustainable technologies. The statement came during a press briefing announcing the Swedish government's infusion of one billion and thirty-five million Swedish kroner in cash (approximately \$97 million) in the aviation sector.

**UK**

## UK Labour rows back on green spending pledge ahead of likely election victory

The UK Labour Party's decision to scrap a £28 billion (\$35.3 billion) green spending pledge could have a knock-on impact on government-driven aviation decarbonisation investment. The **Labour Party**, which according to pollsters and political analysts is expected to win the UK general election due in the next eight months, will scale down green investments to prioritise 'fiscal stability'. While the party had never provided a complete breakdown of the £28 billion spending plan, it had cited an objective to build a "thriving hydrogen industry" (both an alternative fuel for aviation as well as a feedstock for SAF). Labour leader Keir Starmer had also previously referred to the spending plan as an answer to the US' Inflation Reduction Act (IRA), which includes tax breaks and other incentives to stimulate SAF production. In a related development, the **Institute for Public Policy Research (IPPR)** – a think tank historically influential of UK Labour policy – on 6<sup>th</sup> February [published](#) a policy brief with six transport priorities for a new government, including to "ensure aviation is delivering its share of emissions reductions." The IPPR [report](#) argues aviation "has been given a free pass" by the incumbent Conservative government on emissions savings "in the 2020s and into the 2030s." In-line with the recommendations of the **Environmental Audit Committee**, IPPR urged the next UK government to bring forward legislation "to make good the commitment for aviation emissions to be considered within the scope of the sixth carbon budget" as well as a "review of the Jet Zero strategy" by 2025, not 2027. Separately, NGO **Green Alliance** [released](#) on 29<sup>th</sup> February research on zero-emission aircraft as part of a call on the UK government to prioritise their role in the decarbonisation of aviation. Industry coalition **Sustainable Aviation** in March also launched a [new manifesto](#) that sets out how the next UK Government can ensure the UK leads the world in sustainable aviation.



Source: IPPR

**Rishi Sunak reaffirms UK SAF mandate still on track** – UK Prime Minister Rishi Sunak [reaffirmed](#) his commitment to deliver a **UK SAF mandate** to be in place by 2025 as well as a revenue certainty mechanism for SAF by 2026. Sunak's message at a Prime Minister's Questions in the UK Parliament was prompted by a question by MP Henry Smith, a Conservative politician for Crawley, the constituency where London's Gatwick Airport is located. "[Department for Transport] will be consulting in the Spring this year on options for how [the revenue certainty mechanism] should work in practice," Sunak commented. The question follows delays in DfT's finalisation of the SAF mandate and the revenue certainty mechanism, which has prompted [calls from industry for speedier action](#). Ishka notes that expectations for DfT to announce details of the SAF mandate before the Easter holiday did not come to fruition.

**UK Spring budget raises ticket taxes and delivers joint £200M for clean propulsion** – The politically-charged [UK Spring budget](#) – expected by many observers to be the last before an electoral defeat by the UK Conservative Party in an impending 2024 general election – rowed back a 2021 measure by Prime Minister Rishi Sunak (then finance minister) to half **air passenger duty (APD)** on UK flights. APD is not an environmental tax, but it carries an environmental value as it is the only UK government levy on flying, which is exempt from fuel duty and VAT. The government is making "a one-off adjustment" to rates of APD on non-economy passengers to account for high inflation "and help to maintain the value of APD in real terms." In parallel, the UK Chancellor announced £200 million (\$256 million) of joint government and industry **funding for aerospace R&D projects** "supporting the development of energy-efficient and zero-carbon aircraft technology and accelerating the transition to net zero aviation." See the [announcement](#) for a breakdown of the £200 million allocation.



**New RMI report casts light on US SAF policy developments** – Non-profit Rocky Mountain Institute (RMI) in early February published a [new report](#) titled *Refueling Aviation in the US: Evolution of US Sustainable Aviation Fuel Policy* providing a complete overview of US SAF policy development, from an evaluation of federal policies including the Inflation Reduction Act (IRA) incentives to a state policy evaluation covering ongoing efforts in states like Colorado, Illinois, Michigan, Minnesota, New Mexico, New York, Oregon, and Washington.

**SEC adopts 'watered down' climate-disclosure rules without Scope 3 requirements** – The US response to Europe's influential Corporate Sustainability Reporting Directive (CSRD) was [adopted](#) on 6<sup>th</sup> March by the US Securities and Exchange Commission (SEC). The **SEC Climate-Related Disclosures** requirement (see final rules in full [here](#)) ultimately will not force companies to quantify pollution from their supply chains or customers, known as Scope 3 emissions. For aircraft lessors, for instance, this would have meant reporting the emissions of aircraft operations of their lessees (although companies in California [may still need to](#)). For a side-by-side of ISSB IFRS and EU CSRD requirements, see this [comparison table](#) by David Carlin (LinkedIn). For a pre-adoption comparison, see this [quest report](#) by PwC published last September.



**New FAA rule incorporates ICAO New Type emissions limits for aircraft produced from 2028** – The US **Federal Aviation Administration (FAA)** in mid-February [released](#) a final rule to reduce CO2 emissions by most aircraft manufactured after 1<sup>st</sup> January 2028. The [rule](#) requires incorporating improved fuel-efficient technologies for in-production aircraft, and for subsonic jet airplanes and large turboprop and propeller airplanes that are not yet certified. The main component of the rule is the implementation of Environmental Protection Agency (EPA) standards introduced in 2021, which in turn “are the same” as those adopted by ICAO in its airplane CO2 emissions standards (known as the **New Type limit**). Readers may be familiar with the New Type limit from the [EU Taxonomy](#) criteria for aviation, as the eligible aircraft being financed must comply with emissions margins to that limit.

**Other countries**

**Singapore to require 1% SAF by 2026 and 3-5% by 2030**

– Singapore in mid-February published its [long-awaited blueprint](#) to create a sustainable air hub, which sets out Singapore’s action plan for the decarbonisation of its aviation sector. The [Sustainable Air Hub Blueprint](#), developed by the Civil Aviation Authority of Singapore (CAAS) in consultation with industry and other stakeholders, was to be submitted to ICAO the same month as part of **Singapore’s State Action Plan** to achieve net zero aviation emissions by 2050 (see this recent [ICCT briefing](#) for a better understanding of aviation decarbonisation State Action Plans). The full document is available to download [here](#), but was unavailable to access at the time of writing. The most distinctive policy of the Blueprint is the introduction of a **SAF mandate**, something that Singapore – which hosts the largest SAF production facility in operation today – has been teasing for some time. The main features of this SAF requirement will be determined in 2025 pending consultations with more stakeholders, but the current proposal calls for:

- “Aiming” for a 1% SAF target in 2026 and raising the target to 3-5% by 2030 (subject to global developments and the wider availability and adoption of SAF)
- Introducing a “fixed quantum” SAF levy for the purchase of SAF to achieve the uplift target of each year. “The SAF levy will not change, even if the actual SAF price differs from what is projected. Instead, the actual uplift volume of SAF will be adjusted based on the pre-determined SAF levy and prevailing SAF price.”
- From a passenger perspective, the levy will vary based on factors such as distance travelled and class of travel. A 1% SAF uplift in 2026 could increase ticket price for an economy class passenger on a direct flight from Singapore to Bangkok, Tokyo, and London by around S\$3, S\$6, and S\$16 (in USD, \$2 to \$12) respectively. Passengers in premium classes will pay higher levies.

In addition to the SAF mandate, the Blueprint also calls for air traffic management operational improvements to increase efficiency, efforts to reduce energy use and deploy renewables at Singapore’s flagship Changi airport, and five policy and support enablers. Another Singapore-related development in mid-February (announced to coincide with the **Singapore Airshow**) is the [MoU between Airbus](#) and the Singapore Economic Development Board (EDB) to facilitate the establishment of an Airbus Sustainable Aviation Hub in Singapore with a specific focus on technology, research, and innovation.

**Japan Airlines expects 30 yen/litre SAF Japanese government tax credit** – In its FY2023 financial results [presentation](#) unveiled 2<sup>nd</sup> February 2024, Japan Airlines included a slide (page 7) with an overview of its SAF goals and related Japanese government policy. The carrier notes that “government funding expected to be secured for SAF producers in response to demand” includes 340 billion yen (\$2.2 billion) over five years to support SAF manufacturing and support “[supply] chain development” as well as a tax credit “based on amount of SAF produced and sold” estimated to be 30 yen per litre (\$0.19).

**Brazil’s SAF law and well-to-wake emissions targets headed for National Congress approval** – Brazil’s lower house (Chamber of Deputies) on 13<sup>th</sup> March [approved](#) (link in Portuguese) a [legislative proposal](#) (*Combustível do Futuro* – or ‘Fuel of the Future’) to introduce biofuel blending mandates for gasoline and diesel with 429 votes in favour and only 22 against or abstaining. Most notably for aviation, the legislative effort sets in motion the establishment of **Brazil’s national SAF programme** ProBioQAV (*Programa Nacional de Combustível Sustentável de Aviação* – full details [available here](#) in Portuguese). ProBioQAV aims to “encourage research, production, commercialisation and use” of SAF and it establishes that from 2027 aircraft operators will be required to decrease well-to-wake CO2 emissions (emissions in the production of fuel as well as aircraft tailpipe emissions) 1% annually on domestic flights until reaching 10% by 2037. The CO2 emissions reduction target effectively compels airlines in Brazil to uplift SAF, although the law would exempt operators at airports without SAF supply from compliance. The proposal was then headed for Brazil’s upper house, the Federal Senate, [where it remains](#) as this SAVi Extra goes to press.

**Malaysia to allow airlines to charge ‘carbon levy’ that could pay for SAF** – Malaysian transport minister Anthony Loke on 4<sup>th</sup> March [announced](#) that local and international airlines operating in Malaysia will be allowed to start charging a “carbon levy” once amendments to the Malaysian Aviation Commission (Code of Conduct) Regulations 2018 have been finalised by the Malaysian Aviation Commission (Mavcom) in April. Unlike neighbouring Singapore, which will impose a carbon levy to subsidise SAF usage from 2026, airlines operating in Malaysia could add this ticket fee voluntarily. According to reporting by *Malay Mail*, Loke said certain airlines would



Source: CAAS

adopt the fee to purchase SAF while others would use it to pay for carbon credits to offset their emissions. In 2023, Malaysia Aviation Group – the parent company of Malaysia Airlines – became the first organisation in Malaysia to sign a [SAF offtake agreement](#) with domestic energy giant Petronas. On a related note to SAF and Malaysia, **Air New Zealand** on 19<sup>th</sup> March [launched](#) a “global open invitation” to SAF innovators and start-ups to become a supply partner to the airline as it seeks to achieve an industry-leading total 20% SAF uptake by 2030. The airline’s [opportunity statement](#) provides an overview of Air New Zealand’s SAF requirements based on its network, fleet, sustainability targets and criteria. Since its publication, Ishka notes the airline’s statement has been covered in major Malaysian [news media](#), with stories featuring revised quotes alluding to the country’s SAF potential, a possible embodiment of the [country’s aspiration](#) to become a major SAF feedstock supplier.

**Switzerland looking at SAF mandate from 2025** – Switzerland on 21<sup>st</sup> February [approved](#) the postulate report on carbon neutral flying by 2050, setting out technical measures for climate-friendly aviation. The primary approach to reducing carbon emissions involves the use of **SAF**, which a revised CO2 Act would be “**making it mandatory to blend**” from 2025. The report notes that “hydrogen-fuelled and electric aircraft can only marginally reduce emissions” up to 2050, and in order to achieve net-zero carbon sequestration and storage (negative emission technologies) will be required. The full report can be accessed [here](#) (in German).

### Global impact

**Guyana announces first CORSIA Phase 1-compliant credits** – Guyana has [become](#) the first country in the world to offer carbon credits that are eligible for use by airlines in Phase 1 of ICAO’s **CORSIA** global emissions reductions programme. The government of Guyana on 28<sup>th</sup> February said a total of 7.14 million credits were issued by the Architecture for REDD+ Transactions (ART) for conformance with ART’s “TREES” standard. ART is one of only two carbon crediting programs approved by CORSIA for Phase 1. Of the 7.14 million credits, 2.5 million have already been sold at a floor price of \$20 per tonne, leaving a total of 4.64 million credits that will now be available on the international market, including for use by airlines towards CORSIA. Guyana’s announcement marks an important contribution towards enabling airlines to comply with Phase 1 of CORSIA. From 2024 until 2026, airlines that operate flights between over 100 volunteering member states will have to collectively offset international aviation emissions above a baseline of 85% of 2019 levels. Until now, an [absence of eligible credits](#) for Phase 1 had created market uncertainty. That uncertainty is likely to remain, as the nearly five million credits made available by Guyana represent only a small proportion of the 100 million to 200 million credits [expected](#) to be required for airlines to comply with Phase 1 of CORSIA.

**NGO asks ICJ for clarity on whether aviation should count towards national Paris pledges** – Environmental NGO **Opportunity Green** on 21<sup>st</sup> March announced it has [submitted](#) a [written statement](#) to the **International Court of Justice (ICJ)** in The Hague asking the court to confirm that nations have legal obligations under international law to tackle climate impacts from international aviation and shipping following the Paris Agreement’s 1.5°C temperature goal. Most states around the world currently do not account for these emissions in their national climate pledges (NDCs) under the Paris Agreement, leaving agencies like ICAO to act on those emissions instead. Opportunity Green’s submission to the ICJ argues that the efforts of the ICAO and IMO are additional to action under states’ NDCs. Opportunity Green has been making a name for itself as a campaigner for higher aviation environmental accountability at the highest institutional levels. [Earlier this year](#), it also submitted to the UN Special Rapporteur on Human Rights in favour of an Air Passenger Levy (APL) and a tax on kerosene fuel to fund contributions to the COP28-agreed loss and damages (L&D) fund to support developing countries dealing with the adverse effects of climate change.

## CO2 EMISSIONS

-- For details on CORSIA or EU ETS, see Policy and Regulation section below --

**Europe’s ‘growing share’ of aviation emissions is real and present** – new T&E visual – A new interactive report by European sustainable transportation NGO **Transport & Environment (T&E)** puts into perspective the growing share of greenhouse gas emissions (GHG) from the transport sector across Europe and at a European country level – including for aviation. The [State of European Transport 2024](#) report examines GHG since 1990 with further projections until 2030, highlighting the rise in [aviation](#) relative to other sectors. In projections to 2050, T&E expects that by mid-century transportation under the current EU Green Deal will ‘only’ have reduced its emissions by 62% versus 1990 levels, and makes the case for more stringent measures (including cutting flights) to further lower that figure.

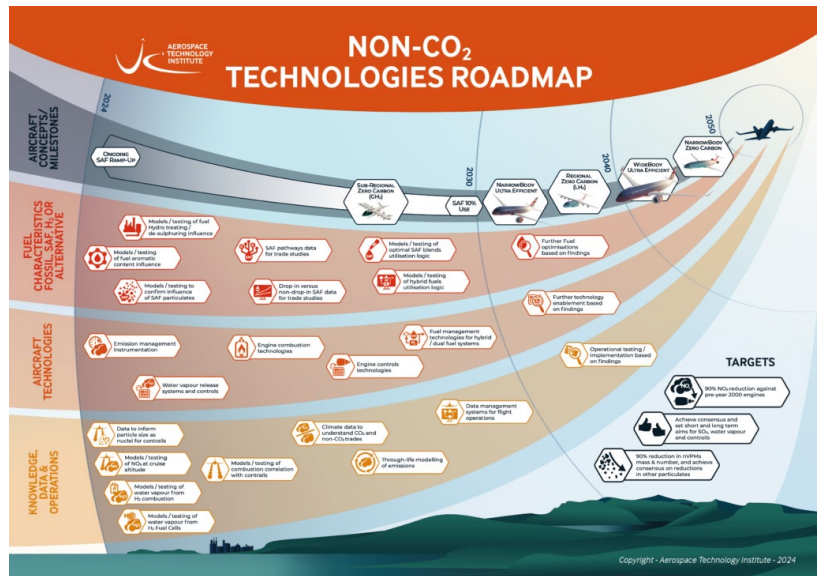
**DNV report: UK to miss climate targets with aviation to blame** – Norwegian risk management firm **DNV** in February [published](#) an [88-page report](#) examining the UK’s transition to Net Zero by 2050. It notes that the UK is currently on course to miss its 2030 targets and its legally binding 2050 net zero target. “We forecast that despite this strong [energy mix] shift, a third of the UK primary energy supply will still be fossil fuels by mid-century, dominated by their remaining unabated use in household heating and aviation.” Aviation will replace road transport as the single largest consumer of oil, more than doubling its share by 2050, the report notes.

**Lufthansa Group partners with carbon capture firm** – The **Lufthansa Group** has joined a growing, albeit still small, group of airlines partnering with carbon capture firms. Subsidiary carrier Swiss and the airline group became **Climeworks’** first customers from the airline industry by signing a long-term carbon removal agreement, Climeworks [announced](#) on 7<sup>th</sup> March.

**NON-CO2 EMISSIONS**

**New research: contrail avoidance cheap relative to climate benefits** – A [new paper](#) by internationally renowned contrail climate experts finds that changes to flight plans to avoid contrail formation could be cheap relative to their climate benefits. The study analyses nearly 85,000 flights carried out by American Airlines in January and June 2023. In those simulations, the researchers found that reducing the warming effect of contrails by 73% **increased fuel costs by just 0.11%** and overall costs by 0.08%, when averaged across those tens of thousands of flights. (Only about 14% of the flights needed to be adjusted to avoid forming warming contrails in the simulations.) “Obviously there’s a trade-off between added fuel and reductions in harmful contrails; that’s real, and it’s one of the biggest challenges to this climate solution,” tells to [MIT Technology Review](#) Marc Shapiro, a coauthor of the paper and director of the contrails team at Breakthrough Energy. “But what we’re showing in this paper is that the added fuel burn is a lot less than we expected.” The finding further confirms research in 2022 by Teoh et al that points at fuel impact of contrail avoidance via rerouting as low as 0.3% across an airline’s flights.

**UK publishes non-CO2 technology roadmap** - A Non-CO2 Technologies Roadmap was [published](#) in March by the **UK’s Aerospace Technology Institute (ATI)**. The roadmap sets out the aerospace sector’s collective ambition to improve understanding of non-CO2 aircraft emissions and the technology advancements needed to address their climate impact. The *Non-CO2 Technologies Roadmap* becomes the fourth pillar of the UK ATI, **Destination Zero**. This guides key industry and government investment into aircraft technologies with the aim of growing the UK’s share of the global aerospace market. The roadmap will inform the activities to be prioritised for funding under a new ATI Non-CO2 Programme to open in May 2024.



Source: UK ATI

**P&W to collaborate with FAA in measuring GTF’s non-CO2 emissions** – Pratt & Whitney [announced](#) on 21<sup>st</sup> March that it will work together with the two federal agencies (the FAA and the EPA) and other research institutions to measure emissions from a P&W GTF engine combustor using both fossil Jet A and 100% HEFA SAF. The test, which will be part of the FAA’s ASCENT programme, will measure among other metrics cruise non-volatile particulate matter and NOx. The rig tests will take place at Pratt & Whitney’s facility in Middletown, Connecticut using an advanced Rich-Quench-Lean (RQL) combustor. The rig allows testing of the full range of combustor operating conditions, including at take-off, ground, and cruise altitudes. Ishka notes that [research in 2023](#) using EASA and ICAO data revealed higher particle matter (nvPM) emissions from the GTF engine than its CFM LEAP rival. Higher nvPM emissions can lead to a higher formation of contrails at high altitudes, including persistent warming contrails with adverse climate effects.

**ZeroAvia blog makes case for fuel-cell’s reduced contrail impact** – A blog post [published](#) by hydrogen-electric OEM ZeroAvia on 20<sup>th</sup> February makes the case that while combusting hydrogen generates 2.6 times as much water as kerosene jet fuel, thereby producing even more contrails at lower altitude and at higher ambient temperatures, **hydrogen fuel cells** contrails will be less persistent if they form in ISSRs - ice supersaturated regions.

**AIRCRAFT LESSORS AND ASSET MANAGERS**

**After e-VTOLs, Avolon now ‘interacting’ with clean tech CTOL** – In its latest [sustainability report](#) published on 8<sup>th</sup> February, major aircraft lessor **Avolon** details that in 2023 it conducted “on-site evaluations” of the top 15 clean technology OEMs (+5 seats), including battery-electric, hybrid-electric, and hydrogen. Avolon includes a sample of 13 OEMs in the report, of which five are working on fixed-wing products in the sub-regional and regional segments (Eviation, Heart Aerospace, Textron, Universal Hydrogen, and ZeroAvia) “We expect these evaluations to lead to closer collaborations in 2024,” the lessor notes in the report. The interest in conventional take-off and landing (CTOL) clean-tech is a shift from Avolon’s approach to clean-tech so far, which has been focused entirely on e-VTOLs. Through its **Avolon-e** platform, Avolon in 2021 placed an order for 500 of Vertical Aerospace’s VX4 e-VTOLs valued at \$2 billion. It also makes Avolon the largest lessor to express a commercial interest in fixed-wing new propulsion technologies, which so far have attracted orders and commitments by 11 leasing and asset manager platforms, according to the [SAVi New Propulsion](#) tracker.

**CALC makes third return to sustainable finance, leading lessors** – Hong Kong-headquartered lessor **China Aircraft Leasing Group (CALC)** [closed](#) in February an unsecured revolving syndicated loan totalling a maximum of \$500 million, becoming the first lessor to announce a sustainable debt raise in 2024. It was the lessor’s third sustainable finance transaction. According to CALC, it is the largest aircraft PDP financing in 2023 (when it closed) and represents the aircraft leasing industry’s first-ever sustainability-linked PDP loan facility. China Construction Bank Shanghai Branch served as the lead arranger. It is the lessor’s third sustainable finance transaction after issuing a RMB 1 billion (\$140 million) debut low-carbon transition bond in 2022 and the completion of the first and second tranches to raise RMB 1.5 billion (\$210 million) of low-carbon transition corporate bonds in 2023.

**Aircastle becomes second lessor to back United Sustainable Venture Fund investor** - United on 14<sup>th</sup> February [announced](#) that lessor **Aircastle** has [become](#) the latest aircraft leasing entity to join its United Airlines Ventures (UAV) Sustainable Flight Fund, a fund of 22 corporate partners backing emission reductions through SAF investments in start-ups. Other companies announced in this latest round of new partners include Air New Zealand, [Embraer](#), Google, HIS, [Natixis Corporate & Investment Banking](#), Safran Corporate Ventures, and Technip Energies. With this latest round, the fund now has more than \$200 million in backing since its inception in February 2023, of which nearly \$500,000 has been contributed by United’s customers. Aircastle’s addition means two lessors (the other being [Aviation Capital Group](#)) have backed the UAV fund, part of a growing trends of leasing firm engaging with the SAF scale-up. For more details on that trend, see this SAVi report published in March: [‘Aircraft lessors and asset managers grow their SAF engagement - new Ishka research’](#).

**Novus-backed SAF One commissions engineering review of SAF plant project - SAF One**, the **Novus Aviation Capital**-backed platform focused on the development of global SAF solutions, announced on 22<sup>nd</sup> February the appointment of engineering firm **Kent** to carry out a technology licensing review for its first synthetic paraffinic kerosene (SPK) production plant. SPK refers to any non-petroleum-based fuel designed to replace kerosene jet fuel, often made from biomass. SAF One said it is “excited to fast-track the development and commercialisation” of SAF.

**MONTE takes over from Montrose Global as sole leasing entity** – Clean propulsion-oriented lessor **MONTE** [announced](#) in February that it has become the sole entity for aircraft leasing business for both MONTE and the former Montrose Global. MONTE said that consolidating its aircraft leasing operations under MONTE reflects its commitment to driving the aviation industry’s transition to net-zero carbon emissions. “MONTE, led by Raymond Eyre and the current management team at Montrose Global, will continue to provide aircraft management services to existing and new clients, just as Montrose Global has done for over 20 years,” the firm said.

## OEM FUTURE PROGRAMMES

**NASA unveils new Boeing X-66 rendering** - NASA’s [released](#) a new rendering of the **X-66** from **Boeing**, the concept aircraft forming the basis of a future Boeing 737 replacement. According to NASA, the rendering demonstrates the aircraft’s signature extra-long, thin wings stabilized by diagonal struts, known as the Transonic Truss-Braced Wing concept.

**Commercial notable updates** during February and March include:

- **SAM secures early delivery positions for 90 Electra eSTOL** – **Surf Air Mobility (SAM)** on 15<sup>th</sup> February [announced](#) that it has secured early delivery positions for **90 Electra eSTOL aircraft** for integration into the Surf Air national flight network including Southern Airways Express and Mokulele Airlines.
- **CAeS gets US launch customer for hydrogen BN-2 Islander** – **Cranfield Aerospace Solutions (CAeS)** on 16<sup>th</sup> February [announced](#) a deal with aircraft fractional ownership firm **Stratus 9 (S9)** for 10 (with options for up to 15) CAeS hydrogen propulsion conversion kits for the B-N Islander aircraft. The deal, valued at over \$20M, paves the way for the first zero-emissions fractional ownership programme in the United States. The integration design of the converted Islander’s hydrogen fuel cell into the nacelle of the aircraft was recently [completed](#).
- **SAM signs MoU with Tanzanian operator** – **Surf Air Mobility (SAM)** on 22<sup>nd</sup> March [announced](#) it has entered into a memorandum of understanding with **Auric Air Services**, a Tanzania-based regional air operator flying both scheduled and charter service across East Africa, to upgrade up to 12 of Auric Air’s **Cessna Grand Caravan** aircraft with SAM’s electrified powertrain technology once certified.
- **ZeroAvia gets Japanese sales partner in ITOCHU** – **ZeroAvia** announced on 22<sup>nd</sup> March it has appointed **ITOCHU Corporation**, which also has a leasing business, to act as its primary sales representative in Japan for its hydrogen-electric engines for aircraft. The [announcement](#) says ITOCHU will “leverage its extensive industry network” and seek opportunities with Japanese airline operators and local infrastructure providers. ITOCHU Corporation offers a wide variety of aircraft and engine financing services.



Source: NASA and Boeing

## Electric

**Cosmic Aerospace raises \$4.5 million in seed funding** – US-European aerospace start-up **Cosmic Aerospace** [announced](#) on 6<sup>th</sup> February it has raised \$4.5 million in seed financing to accelerate the development of its electric aircraft capable of flying up to 1,000 kilometres. The company says its first full-scale flight demonstrator is on track for its first flight in 2026, with entry into service targeted at the end of the decade. The seed round was led by climate tech-focused venture capital firm Pale blue dot.

**Eviation gets new executive leadership** - All-electric aircraft developer **Eviation** in late January [announced](#) the appointment of Andre Stein, the co-founder and former CEO of Embraer-backed e-VTOL developer Eve Air, as its new CEO. Jeff Hurford, an industry veteran and former Gulfstream executive, joins Eviation as CFO – rounding an executive team with long industry experience.

**Airbus e-VTOL makes debut** - Meanwhile, and although Ishka SAVi's clean propulsion coverage generally excludes e-VTOLs, it is worth noting that Airbus' e-VTOL has now officially [made its debut](#). Meanwhile, promises that e-VTOLs could be flying over Paris during the 2024 Summer Olympic games appear to be unlikely to pan out. A *Politico* article on 14<sup>th</sup> February [outlines the reasons](#).

## Hybrid-electric

**Ampaire acquires 'aerotowing' OEM Magpie Aviation** – Hybrid and fully-electric OEM **Ampaire** on 4<sup>th</sup> March [announced](#) the acquisition of **Magpie Aviation**, a developer of innovative electric aviation technologies best known for its ['aero-towing' concept](#). Ampaire says the acquisition will broaden its IP and contract portfolio through "Magpie's multiple pending patents and government contracts" in both the commercial and defence sectors. Following its acquisition, Magpie Aviation [released](#) its concept for a regional electric cargo aircraft called the **MP-1 Cargo** as an [open-source unit economic model](#) for others in the industry to build upon. In July 2023, Ampaire also [acquired](#) California-based eVTOL developer Talyn Air, which also had defence contracts. As of 8<sup>th</sup> March 2024, Ampaire has [commitments](#) for up to 313 'EcoCaravan' Cessna Caravan conversions. The clean propulsion OEM space is not unfamiliar with M&A. In 2022, **Electra** consolidated its eSTOL development with the [acquisition](#) of rival Airflow, and in 2023 UK aircraft producer **Britten-Norman** [merged](#) with **Cranfield Aerospace Solutions (CAeS)**, which is developing a hydrogen-electric retrofit solution for the BN-2 Islander. The former secured new investment in March.

## Hydrogen

**Japanese strategy calls for mid-2030s domestically-produced hydrogen aircraft** - The **Japanese Ministry of Economy, Trade and Industry (METI)** has [published](#) (link in Japanese) a new strategic plan for the country's aircraft industry to commercialise a "next-generation passenger aircraft from 2035 onwards" with "decarbonised" propulsion "such as **hybrid and hydrogen engines**." The strategy follows the definitive cancellation almost one year ago of the Mitsubishi SpaceJet programme, Japan's first domestically produced jet airliner. A meeting took place on 27<sup>th</sup> March between industry leaders and METI officials to unveil the strategy. An *NHK* [report](#) (link in Japanese) following the meeting details that "the government should consider financial support" for this future aircraft programme. The strategy also examines the circumstances behind Mitsubishi Heavy Industries' withdrawal from the development of the SpaceJet. On a related note, the **UK's** Royal Aeronautical Society, the oldest professional not-profit society of its kind and a major aerospace community, in mid-February [published](#) a detailed interview with Shigeya Watanabe, Deputy Director General of the Japan Aerospace Exploration Agency's (JAXA) Aviation Technology Directorate and Naoki Matayoshi, Director of its Aviation Integration Innovation Hub to learn more about the research organisation's current programmes. The interview is one of the most detailed summaries to date (in English, at least) of aviation sustainable technology projects in Japan, from ultra-low NOx propulsion to the development of a hybrid-electric narrowbody and research into future fuels.

**Airbus' Faury comments on future aircraft programmes, including ZEROe** – Airbus at its annual results [press conference](#) on 15<sup>th</sup> February gave away some details on the evolution of its product line-up. Airbus CEO Guillaume Faury commented that the A320 Family replacement due to be introduced "in the second half of the next decade" will not be a stretch of an existing aircraft family (understood to mean the A220 Family) but rather "a new platform" that will be a "100% SAF" airplane. Faury also said that Airbus is currently on the "test phase" for both its **future A320 Family replacement** as well as its ZEROe hydrogen aircraft programme, and stressed that they are "different projects." He further added that the **hydrogen aircraft** set to come to the market "by 2035" will be on the "low-end of the market [...] a place that will not compete with the rest of our product range [...] we could then scale-up [the hydrogen concept] depending on success and time from that position."

**Chinese hydrogen aircraft makes maiden flight** – A **Chinese hydrogen internal combustion aircraft** prototype completed its maiden flight at the end of January in Shenyang, northeast China's Liaoning Province, the country's state news agency *Xinhua* [reported](#). According to the report, the four-seater aircraft has high-pressure gas hydrogen storage of up to 4.5 kilograms. The test aircraft was equipped "with a zero-emission supercharged direct injection hydrogen combustion engine of 80 kw" developed by the **FAW Group Co., Ltd.** According to the report, it is the first independently developed general aviation aircraft in China to be powered by a hydrogen internal combustion engine.

**Universal Hydrogen tests largest fuel cell powertrain on liquid hydrogen** – In a new hydrogen propulsion technological milestone, **Universal Hydrogen** on 27<sup>th</sup> February [announced](#) it had successfully run a megawatt-class fuel cell powertrain (the largest in the world) using its proprietary liquid hydrogen module to supply the fuel. The liquid hydrogen module powered the company's "iron bird" ground test rig for over 1 hour and 40 minutes, simulating a regional aircraft flight profile. The company's liquid hydrogen module

holds fuel to power the iron bird for over three hours at full power, with two such modules sufficient for 500 nautical miles of usable range (on top of reserves) for an ATR72 regional airliner.

**Heart Aerospace triples capital base** - Heart Aerospace announced on 1<sup>st</sup> February it had [tripled](#) its capital base with a Series B raise of \$107 million, taking the total financing raised since inception to \$145 million. Investors include Sagitta Ventures, Air Canada, Breakthrough Energy Ventures, European Innovation Council Fund, EQT Ventures, Lowercarbon Capital, Norrsken VC, United Airlines, and Y Combinator.

**French explorer targets non-stop flight around the world on green hydrogen in 2028** - Born of the heritage of the Solar Impulse Foundation, known for its round-the-world flight in an entirely solar powered plane completed in 2016, French explorer Bertrand Piccard launched **Climate Impulse** on 7<sup>th</sup> February. The [initiative](#) wants to showcase “concrete technologies that can revolutionise the aviation industry” and is targeting a green hydrogen-powered airplane to fly non-stop around the Earth in 2028. The technological design will be headed by the firm Syensqo as main partner, which has been leading the development and design supported by **Airbus**, Daher, Capgemini and with the participation of Ariane Group.

**SAVi New Propulsion Tracker** – In the past two months only three new propulsion technology agreements were announced, including for some of the commitments mentioned above. Access these and other new propulsion deals through Ishka SAVi’s [New Propulsion Tracker](#).

## OTHER DEVELOPMENTS

**ICCT chips in on how aviation taxes can add to the COP28 Loss and Damages fund** - The 2023 UN Climate Change Conference, also known as **COP28** ended in Dubai last December with one key development for aviation: the [launch](#) of an international taxation taskforce by France, Kenya, Barbados, Spain, and other unnamed countries. Although details about the taskforce were (and still remain) scant, the range of options it was set to be considered include levies on international aviation, which France and the EU have previously publicly supported. Those taxes would contribute to the implementation of a **Loss and Damage fund** to support developing nations contending with the worst impacts of global warming. On 8<sup>th</sup> February, the International Council on Clean Transportation (ICCT) [published](#) a blog detailing how much revenue a tax on airplane tickets could raise for the fund. \$164 billion could be raised in a year if economy-class tickets were taxed at \$30 each and premium-class tickets at \$120 each, which could support the approximately \$400 billion per year the fund is estimated to need.

**With size comes pollution – world’s top polluting airport ranking** – ODI, an independent global affairs think tank, published in February a new [policy brief](#) to accompany the [2024 Airport Tracker](#), a global inventory of CO2 and local air pollutants at the airport level aimed at highlighting the climate impact of the world’s largest airports. The tracker now includes impacts of air freight as well as passenger flights, and emissions of local air pollutants. The policy brief highlights that London creates the most air pollution from aviation, as its six airports contributed 8,861 tonnes of NOx and 83 tonnes of PM2.5 (equivalent to approximately 3.2 million cars). London was closely followed by the two airports of Tokyo and Dubai, where aviation-related NOx and PM2.5 emissions were equivalent to approximately 2.8 million passenger cars in each city.



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Many other stakeholders will also benefit from attending, including policymakers, regulators, fuel and energy companies, NGOs and carbon market professionals, consultants and researchers.

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