European Parliament
2019-2024

Plenary sitting

A9-0438/2023

15.12.2023

REPORT

on electric aviation – a solution for short and mid-range flights
(2023/2060(INI))

Committee on Transport and Tourism

Rapporteur: Erik Bergkvist

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MOTION FOR A EUROPEAN PARLIAMENT RESOLUTION

on electric aviation – a solution for short and mid-range flights
(2023/2060(INI))

The European Parliament,

– having regard to the Treaty on the Functioning of the European Union (TFEU), in particular Article 90 thereof,

– having regard to the Treaty on European Union (TEU), in particular Article 3(3) thereof,

– having regard to the Commission proposal of 16 March 2023 for a regulation of the European Parliament and of the Council on establishing a framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem (the Net Zero Industry Act) (COM(2023)0161),

– having regard to the Commission proposal of 14 July 2021 for a regulation of the European Parliament and of the Council on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council (COM(2021)0559),

– having regard to the Commission proposal of 14 December 2021 for a regulation of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network, amending Regulation (EU) 2021/1153 and Regulation (EU) No 913/2010 and repealing Regulation (EU) 1315/2013 (COM(2021)0812), in particular Section 5 thereof on air transport infrastructure,

– having regard to the Commission proposal of 7 June 2018 for a regulation of the European Parliament and of the Council establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination (COM(2018)0435),

– having regard to the Commission proposal of 11 June 2013 for a regulation of the European Parliament and of the Council on the implementation of the Single European Sky (COM(2013)0410),

– having regard to the Commission communication of 29 November 2022 entitled 'A Drone Strategy 2.0 for a Smart and Sustainable Unmanned Aircraft Eco-System in Europe' (COM(2022)0652),

– having regard to the Commission communication of 9 December 2020 entitled 'Sustainable and Smart Mobility Strategy – putting European transport on track to the future' (COM(2020)0789),

– having regard to Regulation (EU) 2021/1119 of the European Parliament and of the

Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')[1], transforming the European Green Deal goals into law,

– having regard to Regulation (EU) No 598/2014 of the European Parliament and of the Council of 16 April 2014 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach and repealing Directive 2002/30/EC[2],

– having regard to Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC[3], and in particular the establishment of the Innovation Fund,

– having regard to the European Green Deal, which aims to set the EU on the path to a green transition, with the ultimate goal of reaching climate neutrality by 2050,

– having regard to the adoption of the Fit for 55 package and the proposals included therein, notably the proposal to increase the production and uptake of sustainable aviation fuels (SAF), also known as the ReFuelEU Aviation initiative, and the proposal to revise the EU's emissions trading systems (ETS) as regards CO_2 emissions from aviation,

– having regard to its resolution of 9 May 2023 on the new EU urban mobility framework[4],

– having regard to its resolution of 11 November 2015 on aviation[5],

– having regard to its resolution of 10 May 2012 on the future of regional airports and air services in the EU[6],and its resolution of 16 February 2017 on an Aviation Strategy for Europe[7],

– having regard to the European Union Aviation Safety Agency (EASA) special certification conditions SC E-19 for electric/hybrid propulsion systems,

– having regard to Rule 54 of its Rules of Procedure,

– having regard to the report of the Committee on Transport and Tourism (A9-0438/2023),

A. whereas by 2019, emissions from international aviation had increased by 146 % compared to 1990[8]; whereas this share is expected to grow as demand for air travel

[1] OJ L 243, 9.7.2021, p. 1.
[2] OJ L 173, 12.6.2014, p. 65.
[3] OJ L 275, 25.10.2003, p. 32.
[4] Texts adopted, P9_TA(2023)0130.
[5] OJ C 366, 27.10.2017, p. 2.
[6] OJ C 261 E, 10.9.2013, p. 1.
[7] OJ C 252, 18.7.2018, p. 284.
[8] European Parliament, Emissions from planes and ships: facts and figures (infographic), updated on 15 June 2023.

increases;

B. whereas 50-55 % of emissions could be reduced by shifting to SAF, 30-35 % by deploying new technologies, 5-10 % by optimising aircraft operation and infrastructure, and 5 % by opting for new market-based measures[9];

C. whereas in order to deliver the required emission reductions by 2050, 75 % of the global civil fleet will have to be replaced from 2035 onwards;

D. whereas the case for truly clean aviation requires deeper collaborations across research, manufacturers, airlines, governments and other stakeholders; whereas a subset of the aviation industry is already active in developing advanced concepts of aircraft[10] such as electrical vertical take-off and landing (eVTOL) aircraft;

E. whereas the Clean Aviation Joint Undertaking (CAJU) is the EU's leading research and innovation programme for transforming aviation towards a sustainable future; whereas the CAJU and EASA are cooperating on adapting the standard certification regime for a new generation of aircraft;

F. whereas small electric test aircraft of up to nine seats are already flying in various EU regions; whereas electric aircraft of up to 30 seats are planned for the late 2020s, and regional aircraft for the 2030s[11]; whereas the first fleet of electric aircraft certified by EASA[12] is already engaging in safe and environmentally friendly pilot training activities; whereas several eVTOL models have already applied for type certification with EASA;

G. whereas EASA has proposed rules for the safe operation of VTOL aircraft, which includes air taxis, and a comprehensive set of operational requirements for piloted electric air taxis, spanning across the domains of operations, flight crew licensing and rules on the air and air traffic management;

H. whereas electric and hybrid-electric aviation could bolster urban and regional air mobility and connectivity, offering a whole range of innovative public transport solutions; whereas, in the meantime, plans are also taking shape for the widespread take-off of hydrogen-powered aircraft by 2035;

I. whereas electric and hybrid-electric aviation will improve competitive travel times over shorter distances through faster transfer; whereas electric aircraft will carry fewer passengers in small airplanes, which means less time spent on boarding and ground handling;

J. whereas the EU is witnessing rapid development in battery technology in terms of both production volumes and development expenditure;

K. whereas the success of highly complex research and development projects in the field of

[9] Waypoint 2050, 'Aviation: Benefits Beyond Borders', Figure 2.
[10] ATR, Avinor, Deutsche Aircraft (in cooperation with Private Wings), Heart Aerospace (in cooperation with Finnair and Icelandair), Pipistrel, SAS (in cooperation with Airbus), Tecnam, etc.
[11] Fact sheet, 'Net zero 2050: new aircraft technology', IATA, June 2023.
[12] Pipistrel Velis Electro.

clean aviation directly depends on financial and political support, including that of the EU institutions and the Member States; whereas multiple alliances on clean aviation have been formed, such as the Alliance for Zero Emission Aviation (AZEA), which are currently working on project pipelines, but need effective EU support; whereas public incentive for these projects is key in attracting private investment;

L. whereas Member State investments in the electricity supply of stationary aircraft will be needed in the upcoming years in order to comply with the targets set out in Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure[13], which could become a stepping stone towards the future deployment of charging infrastructure for electric aircraft;

M. whereas the carbon footprint calculation of electric and hydrogen-powered aviation needs to be based on its entire life cycle, including the source of energy production and battery manufacturing;

N. whereas although the aviation sector has had a sharp reminder of its vulnerability to pandemics, geopolitics and economic shocks, it has proved its key role in keeping the supply chain uninterrupted, especially for essential goods;

O. whereas green and digital skills in technical education and expertise, such as aviation technology and engineering, science and mathematics, are vital for the sustainable development of aviation, and create attractive jobs for young people;

P. whereas safety must remain the number one priority in aviation;

Benefits of aircraft electrification

1. Observes the importance of regional airports in the Union for short and medium-range electric flight operations; highlights the potential of regional airports as multimodal innovation hubs and of small and medium-sized enterprises (SMEs) throughout the whole supply chain, benefiting research and competition not only in the aviation sector, but also in other transport sectors such as road, maritime and rail; asks the Commission, therefore, to affirm its financial support for regional airports, especially those that are active in the field of electric aviation;

2. Is convinced that cleaner, faster and more convenient air transport options would increase connectivity and accessibility in smaller, more isolated and sparsely populated areas, including island regions and the outermost regions, and particularly in terms of access to public services, the creation of job opportunities and more sustainable tourism;

3. Notes that the outermost regions will be difficult to connect to Europe’s mainland via electric aviation owing to their remoteness and the limited battery capacity of the aircraft; highlights, however, the potential of electric aviation in ensuring connectivity between the outermost regions, contributing to their development and partially alleviating the negative consequences for their economy resulting from their difficult topography; stresses the need for financial, substantive and technical support for the peripheral regions in order to ensure that the infrastructure necessary for the fast and

[13] OJ L 234, 22.9.2023, p. 1.

reliable charging of batteries, the servicing of eVTOL aircraft and the training of highly qualified technicians and operators develops at an appropriate pace;

4. Stresses that when faced with geographical barriers, the time saved using electric flights as a new means of public transport that does not rely on existing roads or rail tracks can be considerable; refers to the experience of the Nordic countries, which combine geographies characterised by fjords, lakes and mountains, a low population density and a strong focus on sustainable energy[14], and of the outermost regions, which are characterised by their insularity, remoteness, small size and difficult topography and climate; asks the Commission to explore this potential in close cooperation with the relevant regions and Member States;

5. Considers that the electrification of regional aviation could make previously abandoned routes economically viable, improving connectivity, boosting regional development and attracting new regional investment; underlines the credible prospects of hybridisation in view of the regional aviation constraints related to the autonomy and number of passengers;

6. Reiterates the Commission's vision that eVTOLs, as expressed through the Commission's Drone Strategy 2.0, are set to become a staple of passenger transport by 2030, becoming integrated into existing transport systems and contributing to the decarbonisation of the EU, while minimising any adverse environmental impacts[15]; highlights the fact that, despite the rapid technological developments in eVTOLs, they are currently still limited to six seats, while fixed-wing electric aircraft are already able to carry more passengers on both existing and new urban air routes; calls on the Commission to differentiate between the two possibilities as they use different technologies and serve different markets; is convinced that both eVTOLs and fixed-wing electric aircraft must be seen as complementary forms of new urban air mobility;

7. Highlights that aircraft with electric engines cause close to zero operational pollution, meaning a reduction in local emissions that could adversely affect the health of citizens living close to airports; considers, therefore, that low-decibel airplanes, in particular, should benefit from simplified procedures to obtain noise-related permits or derogations from flight restrictions; stresses that noise reduction achieved through low-decibel electric aviation can improve the situation of some airports and nearby residential areas;

8. Stresses the need to capitalise on the potential of the significantly lower noise levels of electric and hybrid-electric aircraft; urges the industry to make use of EASA's work in defining the first Environmental Protection Technical Specification[16] for the noise assessment of certain eVTOL aircraft, which aims to provide a high and uniform level of environmental protection for European citizens and facilitate their integration into the aviation ecosystem and urban environment;

9. Strongly believes that electric and hybrid-electric aircraft will offer significant potential for the reduction of greenhouse gas emissions in aviation and new possibilities for urban

[14] Accessibility study for electric aviation. Part of the project Electric Aviation and the Effect on Nordic Regions.
[15] Idem.
[16] https://www.easa.europa.eu/en/newsroom-and-events/press-releases/easa-publishes-worlds-first-proposal-assessment-and-limitation.

mobility; welcomes the work undertaken so far by EASA on eVTOL aircraft intended to be used as air taxis, on the design of the necessary ground infrastructure for safe urban air mobility operations[17] and on the adaptation of the aviation regulatory framework to facilitate the entry into the market of aircraft that use electric and hydrogen-powered propulsion; stresses the key role of EASA in certifying these types of aircraft as it could speed up their development; supports the commercialisation of environmentally friendly aircraft using alternative propulsion technologies to complement the measures launched under the sustainable aviation fuel initiatives; invites the Commission to take action in the future to ensure that electric flights serve short regional routes for the purposes of public service obligations under the applicable EU rules;

Investing for the future

10. Considers that while short and medium-haul flights account for a fraction of emissions, every electrified route represents a reduction in aviation's climate and environmental footprint and is a worthwhile investment; insists that pooling of the necessary investment must start now;

11. Considers that low and zero-emission targets will also be reached using the hybrid-electric technologies developed for regional and international short and medium-haul flights operated for the purposes of both commercial and business aviation, and calls for the necessary research and development investments for aircraft and propulsion system design, batteries and other hybrid solutions; notes that with the commercialisation of electric aviation, Member States should consider revisiting their legislation banning short and medium-haul flights;

12. Notes that the substantial needs related to the replacement of the civil fleet represent a challenge and require substantial financial investment, while also being a major market opportunity that could lead to the creation of new jobs and skills for the whole transport sector in Europe;

13. Insists that developing electric aviation for commercial use requires effective financial and regulatory support at both national and EU level; stresses the very positive results achieved with the help of public procurement and considers it to be an effective tool for the electrification of the industry without disrupting the market;

14. Invites the Member States to explore market incentives and benefits for the electric aircraft manufacturers, operators and SMEs concerned in order to promote the development and adoption of this eco-friendly technology; believes that these incentives and benefits for electric aviation components, electricity and emissions credits can drive market growth;

15. Notes that there are many short and medium-haul flights being operated across Europe; calls on the Commission, in cooperation with Eurocontrol and EASA, to identify the flight routes that are most suitable for full electrification and that would result in more significant CO^2 reductions, as this will help the concerned airports to start the necessary

[17] EASA, 'Vertiports. Prototype Technical Specifications for the Design of VFR Vertiports for Operation of with Manned VTOL-Capable Aircraft Certified in the Enhanced Category (PTS-VPT-DSN)', March 2022.

adaptations; stresses that hydrogen can play a significant role in reducing emissions; points out that companies are placing their hopes in electric aircraft for smaller-scale solutions and hydrogen-powered aircraft for larger ones;

16. Considers it necessary to examine the possibility of modifying existing EU State aid rules to enable the creation of a targeted investment framework that builds on public and private funding to support the emerging resource-intensive eVTOL sector in order to strengthen Europe's strategic autonomy in this area, as eVTOLs are bound to become a strategic part of the transport sector;

17. Considers that EU companies active in the field of electrifying the aviation sector should work in closer cooperation with national and EU authorities to develop an integrated technical roadmap and joint research programmes; welcomes the work undertaken under AZEA; stresses that this cooperation is essential for the EU to maintain its industrial leadership and competitiveness on the international scene;

18. Notes that smaller electric aircraft can operate from existing shorter and simpler runways, which could reduce the need for large and expensive infrastructure in the future;

19. Stresses that the planning and readiness of energy infrastructure is a key factor in determining the take up of electric and hydrogen-based aviation, as only once the infrastructure has been prepared and tested will deployment of electric aviation be possible; notes that, after shifting to alternative propulsion systems, existing large airports could consume 5-10 times more electricity by 2050 than they do today[18], and observes that infrastructure for electric aircraft and the electrification of sites such as airports has not yet been sufficiently developed; points out that, to meet the expected energy demand, the first elements of on-airport infrastructure must be in place by 2025, and calls for the necessary investment to be secured; stresses, furthermore, in this regard, that in order to ensure a proper rollout of electric aircraft, the Commission and the Member States must properly implement the Alternative Fuels Infrastructure Regulation (AFIR)[19] to further promote the electrification of sites; highlights the utility of dedicated infrastructure funding projects, in this regard, such as the Connecting Europe Facility for transport and energy; recalls that, under AFIR, the Commission must evaluate at the end of 2026, and every 5 years thereafter, the current state and future development of the market for hydrogen and electric propulsion aviation; urges the Commission and the Member States to ensure that this evaluation takes place, including a feasibility study on the deployment of the relevant infrastructure to power aircraft, followed by a deployment plan for alternative fuels infrastructure in airports, in particular for electric recharging and hydrogen refuelling points; encourages the industries on a global level to agree on global standards for ground charging stations for stationary aircraft as soon as possible;

Technological challenges and solutions

[18] *Target True Zero: Delivering the Infrastructure for Battery and Hydrogen-Powered Flight*, World Economic Forum, April 2023, pp. 10-15.
[19] Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU, OJ L 234, 22.9.2023, p. 1.

20. Given that technological trends in various transport sectors are moving in the same direction, welcomes the existing cross-industry research and development partnerships[20] between air and automotive industries (on the development of the next generation of batteries and fuel cells), air and shipping (on the use of alternative fuels) and air and railways (on electrical distribution systems);

21. Points out that while electric and hybrid-electric aircraft hold immense promise for a more sustainable aviation future, their current generation of batteries presents significant challenges, primarily related to weight and energy density; notes that these limitations impact the range, payload capacity and overall efficiency of electric aircraft;

22. Recalls that electric aircraft operations involve stringent requirements for batteries, prioritising safety, but also requiring them to be light, compact, quickly rechargeable and to provide the high power required for the take-off and climb segments; underlines that such high performance batteries require critical raw materials, which are often not available in Europe; calls on the aviation industry to be part of the industries' efforts to provide a sustainable supply chain;

23. Recalls that the altitude conditions specific to air transport impose particular technical constraints on batteries, compared to other modes of transport;

24. Highlights the potential of hydrogen-powered aviation based on fuel cells, which is an alternative form of electric aviation, particularly in terms of autonomy; stresses that continued improvements in battery and fuel cell technologies, paired with more energy-efficient aircraft designs, can enable better environmental performance; reiterates that some of the biggest technological challenges faced by the industry currently include the weight and dimensions of batteries, the maximum power output of fuel cells, electric distribution and thermal systems, airframe integration and improving aerodynamics;

25. Stresses that the increased use of batteries in aeronautics will require the immediate set-up of an EU recycling industry compatible with the needs of the sector in order to avoid the creation of new dependencies on non-EU countries;

Action in the framework of the EU

26. Recalls that the aeronautics industry is not only an important enabler of economic activity, but also one of the most successful high-tech sectors in the EU; asks the Commission for proactive policies to support and develop the industry in close cooperation with existing forums such as the Advisory Council for Aviation Research and Innovation (ACARE) and AZEA; calls on the Commission to ensure that the existing EU regulations in the field do not counteract each other or prevent the aeronautics industry from developing its decarbonisation and electrification projects;

27. Believes that further alignment between the Aerospace and Defence ecosystem and the Energy ecosystem is needed to enhance electric flight; notes that the Commission is working on separate transition pathways for both ecosystems; recognises the paramount importance of transition pathways for enabling the industry to effectively translate

[20] Airbus and Renault Group to advance research on electrification.

climate aspirations into tangible climate actions, thereby preserving and creating value for our society, our planet and businesses alike; is nevertheless concerned by the diverging transition pathways of the two ecosystems, particularly in the light of the shared imperative to establish sufficiently stable electricity grids and ensure the affordability of clean electricity, including for aircraft electrification; underlines, in view of the above, the importance of a common strategy for electric aircraft and urges the Commission to take proactive steps to formulate such a strategy; calls on the Commission, furthermore, to initiate a joint structural dialogue between the Directorate-Generals for Mobility and Transport and for Energy, in this regard, and to complete the pathway before the European elections in 2024 so that it can be used as a reference for future regulations by the new upcoming Commission in 2024;

28. Recalls that AZEA was created on the initiative of the Commission to gather all private and public partners across the aviation ecosystem to prepare for the entry into commercial service of hydrogen-powered and electric aircraft; calls on the Commission to work with and support AZEA in developing knowledge about electric aviation; notes that the Net-Zero Industry Act skills academies could be used in this respect and calls on the Commission and the Member States to promote them;

29. Underlines the current shortage of skills in electrical and systems engineering; recalls that the EU Contest for Young Scientists could be used as a reference point to develop a thematic EU contest for young talents for all industrial ecosystems, including for electric flights; calls on the Commission and the Member States to increase awareness about opportunities in green careers in aviation and to encourage national and EU projects in this regard;

30. Welcomes the Commission’s intention to create coordinated services of calls under the existing EU instruments and the European Investment Bank (EIB) loans to support the new flagship project on drone technologies; urges the EIB to introduce and deploy targeted funding instruments designed to bolster the emerging European electric aviation sector and support its needs, acknowledging its capital-intensive nature and unique requirements, and recognising that the rollout of eVTOLs will also require investments in ground infrastructure, including vertiports and charging infrastructure;

31. Is concerned that the budget envisaged for CAJU under the Horizon Europe programme is far below the scale of its ambition; recalls that the level of innovation associated with each project is very high and that the support must be commensurate and continuous under the new multiannual financial framework from 2027 onwards; considers that CAJU should also be encouraged to handle electric aviation and prioritise the funding of innovative projects on zero-emission aviation such as electric and hydrogen-powered aircraft; points out that new funding is necessary to go beyond Technology Readiness Level 6 in order to bring technologies to the market; welcomes the recent announcement of the UK as an associated country to Horizon Europe, which will boost our common efforts towards clean aviation;

32. Regrets the fact that, despite the substantial effort and commitment demanded by the aviation sector in its pursuit of decarbonisation, there is no specific EU aviation fund designated explicitly to supporting aviation; calls on the Commissions to launch specific calls to finance projects supporting electrification and actions to reduce the overall

impacts of aviation; recalls, however, that the Innovation Fund under the ETS and the use of Carbon Contracts for Difference, are important instruments for deploying and bringing to industrial scale the technologies that could pave the way for electric and hydrogen-powered aviation; recalls Directive (EU) 2023/959[21], which amended Directive 2003/87/EC and broadened the range of eligible projects for funding under the Innovation Fund to encompass a wider array of zero-carbon products, processes and technologies;

33. Stresses the need to improve battery thermal management and battery charging and replacement management as well as to accelerate the development of the battery recycling sector; calls on the Commission to invest in research and development of next generation solid-state batteries that have twice as much energy as lithium-ion batteries and approximately three times higher storage potential; calls, therefore, on the Commission to encourage, through instruments such as the Net-Zero Industry Act and the European Battery Alliance, decreasing dependencies in the battery supply chain and ensuring sufficient supply of critical raw materials, thereby reducing our external dependencies on batteries; encourages the Commission and the Member States to continue developing, in parallel, strategic partnerships with like-minded non-EU countries in the area of raw materials for aeronautics;

34. Calls on the Commission to ensure consistency between the development of electric transport and mobility, the required infrastructure and EU policies aimed at increasing European battery production capacity, including the supply of the raw and advanced materials needed for battery production; calls, therefore, on the Commission to revise the Strategic Action Plan on Batteries, which links the aforementioned aspects and specifically includes the introduction of quantified and time-bound targets for EU battery production; calls on the Member States and the Commission, in view of the above, in cooperation with the industry, to identify potential synergies with the road transport sector in order to maximise public and private investment, especially in the production and recycling of batteries and fuel cells;

35. Calls on the Commission to create a policy framework that will support the uptake of electric aircraft technologies, such as channelling part of the revenues from ETS aviation or any taxation on aviation to CAJU, in accordance with the proposal on the Energy Taxation Directive[22];

36. Calls on the Commission to create a strategy to ensure that the necessary infrastructure for electric aviation, including power generation, grid connection and charging infrastructure, is deployed commensurate to the uptake of electric aircraft; recalls that the scarcity of green hydrogen and the lack of infrastructure could delay the entry into service of hydrogen-powered aircraft; urges the Commission to develop a targeted strategy for hydrogen production and storage;

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[21] Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system, OJ L 130, 16.5.2023, p. 134.

[22] Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity, OJ L 283, 31.10.2003, p. 51.

37. Calls on EASA to continue working towards setting certification standards and pathways to make electric and hybrid-electric airplanes viable and capable of significantly shortening the time-to-market of such airplanes; calls on the Commission to provide the necessary resources, especially staff, in this respect;

38. Calls on the Commission to come up with a European strategy for a coordinated approach to the development, certification and deployment of the new generation of aircraft, including eVTOL aircraft, in order to raise awareness among European citizens of its benefits and to boost private and public investment, while maintaining the technological base and leadership in Europe; believes that electric aviation holds the promise of a more sustainable future for air travel and that a focused information campaign is vital in raising public awareness about its potential benefits and impact;

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39. Instructs its President to forward this resolution to the Council and the Commission.

EXPLANATORY STATEMENT

Aviation accounts for a relatively small share of global emissions but is one of the most challenging sectors to decarbonise. Your rapporteur argues that electric and hybrid aviation for short and mid-range flights could offer an entirely new pattern of air transport services, simultaneously creating such positive side effects as a viable urban and regional air mobility network and Europe's continuous industrial leadership throughout the transition to climate neutrality.

Although currently a significant part of decarbonisation effort in the field of aviation focuses on sustainable aviation fuels (SAF) that require few, if any, alterations to aircraft or airport infrastructure, a segment of the industry is already working on advanced concept of battery-electric and hybrid aircraft – the enabler of electric aviation.

From a purely technical standpoint, all-electric configuration eliminates CO_2 emissions along with greenhouse gas and water vapour, making it the most sustainable form of technology capable of zero emissions during flight operations. Today, all-electric aircraft are successfully used in providing a more environmentally friendly education to prospective pilots.

While various technological and regulatory complexities put a limit on the flying range of battery-electric aircraft, predominantly using them for short and medium-haul operations, this type of aircraft could become an optimal solution for urban and regional air mobility. This is especially relevant considering the recent historical ban on short-haul domestic flights, which can be covered by train, in one of the EU Member States.

Electric vertical take-off and landing (eVTOL) aircraft highlight the promise and progress of electric and hybrid aircraft in the context of urban environment. Ability to bypass congested urban nodes, connect smaller and large airport hubs and, simultaneously, reduce congestion and vehicle parking requirements at large airports are only some of the advantages they present. Importantly, to support this innovative technology, EASA has prepared the guidance on vertiports, including the design of the ground infrastructure necessary for the safe operation of urban air mobility services.

When it comes to regional air mobility, electric aircraft offers cleaner, faster, and more convenient means of transportation, particularly, between remote and geographically isolated areas. Your rapporteur draws attention to the experience of the Nordic countries that share many accessibility challenges related to their remote regions, where large bodies of water, vast forest areas, long coastal lines, mountain ranges and fjords restrict mobility. Geographical barriers also mean limited access to public services, jobs as well as the larger national and international transport system. Bearing in mind the lack of roads or limited public transport, it becomes evident that some of these places are more accessible by air than by land. Particularly in this context, more flights within 'point-to-point' network operated by smaller electric planes could be offered, representing a completely new way of seeing local public transportation.

In the same vein, flying electric could open up new opportunities to spur economic development by repurposing regional airports and servicing previously abandoned or currently underserved areas. To support this ambition, a long-term EU strategic plan should be considered to address the challenges and opportunities that regional airports face in relation to the emerging electric aviation, focusing on their role in ensuring cohesion among EU regions and supporting them as one of the pillars of the EU's growth and jobs strategy as well as drivers of innovation.

The future of electric aviation will largely depend on the future of battery technology. Although the EU is seeing rapid development in this field, the current situation cannot ensure sufficient maturity to cover the same distances as jet fuel-driven aircraft. Electric aircraft operations set stringent requirements on batteries, which have to provide the high power

required for the take-off and climb segments. Furthermore, they need to be housed inside the airplane with sufficient cooling measures to prevent thermal runaway and, ultimately, failure. As a strategic part of Europe's clean and digital transition, this key enabling technology should remain one of the focal points of the EU research, development and innovation activity.

In this sense, your rapporteur applauds various cross-industry research and development partnerships, as technological trends within different transport sectors tend to move in the same direction. For instance, development of the next generation of batteries could and do benefit from collaborations of air and automotive industry. On top of that, a significant work in transforming aviation towards a sustainable future is undertaken by the Clean Aviation Joint Undertaking (CAJU). Co-funded by the European aeronautical industrial stakeholders, this largest impact-orientated public-private partnership under the Horizon Europe programme is a key player in driving aviation research and innovation. Regrettably, although aeronautics is one of the most successful EU's high-tech sectors, an important enabler of economic activity and a driver of competitiveness, the work of CAJU is not enjoying the level of funding necessary to match the scale of its ambition. Therefore, a European strategy for a coordinated approach to the development, certification, and deployment of the new generation of aircraft should be considered to raise awareness of its benefits among the European citizens, and to boost private and public investment while maintaining the technological base and leadership in Europe.

Going sustainable implies a sweeping fleet renewal by 2050. Although this is a challenge in itself, it also represents a major market opportunity that could lead to new jobs and skills for the whole transportation sector in Europe.

While aircraft developers and manufacturers are envisioning a new future of electrification, airports should start shifting their focus to the issue of long-term power demand. To deliver electricity the aircraft will need, airports and airlines will need to ensure significant infrastructure investments. As roughly 90% of this investment will be used for off-airport infrastructure – primarily for power generation – the aviation sector should consider partnering with other industries to secure enough of green electricity and to support their infrastructure needs.

Finally, the advent of electric and hybrid aircraft means a brand new body of global rules and standards related, among other things, to certification methods, recharging, refilling, and maintenance. In this respect, your rapporteur welcomes the shared work of CAJU and EASA that comprises different projects aiming to de-risk the development and the demonstration of the new concepts and technologies as well as to define new certification methods and means of compliance for aircraft and systems designs.

Aviation is fundamental to the EU's economy and to keeping people connected. After grappling with the consequences of the COVID-19 pandemic and the energy crisis unleashed by the war in Ukraine, the aviation industry seems to be set on its rebound path. Its task today is to restore its normal operations while prioritising innovative technological solutions to ensure next generation flight operations with low environmental impacts. In this context, the future of short and mid-range electric travel promises a transformational market boasting a network of highly efficient regional transportation with positive environmental and logistical benefits.

ANNEX: ENTITIES OR PERSONS
FROM WHOM THE RAPPORTEUR HAS RECEIVED INPUT

Pursuant to Article 8 of Annex I to the Rules of Procedure, the rapporteur declares that he has received input from the following entities or persons in the preparation of the report, until the adoption thereof in committee:

Entity and/or person
Transportföretagen
Scandinavian Airlines
SAFRAN
Rolls-Royce
GKN Aerospace
SINTEF AS
Clean Aviation Joint Undertaking
Europe Air Sports
Trafikverket
General Aviation Manufacturers Association (GAMA)
Conference of Peripheral Maritime Regions (CPMR)
Heart Aerospace

The list above is drawn up under the exclusive responsibility of the rapporteur.

INFORMATION ON ADOPTION IN COMMITTEE RESPONSIBLE

Date adopted	7.12.2023
Result of final vote	+: 27 –: 0 0: 12
Members present for the final vote	José Ramón Bauzá Díaz, Izaskun Bilbao Barandica, Karolin Braunsberger-Reinhold, Marco Campomenosi, Jakop G. Dalunde, Karima Delli, Mario Furore, Isabel García Muñoz, Jens Gieseke, Bogusław Liberadzki, Peter Lundgren, Elżbieta Katarzyna Łukacijewska, Tilly Metz, Cláudia Monteiro de Aguiar, Caroline Nagtegaal, Tomasz Piotr Poręba, Bergur Løkke Rasmussen, Dominique Riquet, Thomas Rudner, Vera Tax, Barbara Thaler, István Ujhelyi, Achille Variati, Elissavet Vozemberg-Vrionidi, Lucia Vuolo, Kosma Złotowski
Substitutes present for the final vote	Tom Berendsen, Sara Cerdas, Maria Grapini, Ondřej Kovařík, Ljudmila Novak, Dorien Rookmaker, Nicolae Ştefănuţă, Kathleen Van Brempt
Substitutes under Rule 209(7) present for the final vote	Andreas Glück, Erik Marquardt, Andżelika Anna Możdżanowska, Wolfram Pirchner, Eugen Tomac

FINAL VOTE BY ROLL CALL IN COMMITTEE RESPONSIBLE

27	+
NI	Mario Furore
PPE	Tom Berendsen, Karolin Braunsberger-Reinhold, Jens Gieseke, Elżbieta Katarzyna Łukacijewska, Cláudia Monteiro de Aguiar, Ljudmila Novak, Wolfram Pirchner, Barbara Thaler, Eugen Tomac, Elissavet Vozemberg-Vrionidi, Lucia Vuolo
Renew	José Ramón Bauzá Díaz, Izaskun Bilbao Barandica, Andreas Glück, Caroline Nagtegaal, Bergur Løkke Rasmussen, Dominique Riquet
S&D	Sara Cerdas, Isabel García Muñoz, Maria Grapini, Bogusław Liberadzki, Thomas Rudner, Vera Tax, István Ujhelyi, Kathleen Van Brempt, Achille Variati

0	-

12	0
ECR	Peter Lundgren, Andżelika Anna Możdżanowska, Tomasz Piotr Poręba, Dorien Rookmaker, Kosma Złotowski
ID	Marco Campomenosi
Renew	Ondřej Kovařík
Verts/ALE	Jakop G. Dalunde, Karima Delli, Erik Marquardt, Tilly Metz, Nicolae Ştefănuţă

Key to symbols:
+ : in favour
- : against
0 : abstention