



**EUROPEAN COMMISSION**  
DIRECTORATE-GENERAL FOR RESEARCH & INNOVATION

Directorate D - Clean Planet

**CALL FOR EXPRESSIONS OF IDEAS/POTENTIAL MEMBERS  
FOR THE FUTURE EUROPEAN PARTNERSHIP ON CLEAN AVIATION  
UNDER HORIZON EUROPE**

## 1. Introduction/Background

The European Green Deal (EGD) proposed by the European Commission will include the first European Climate Law to confirm the 2050 climate-neutrality objective in legislation. The task facing the aviation sector, in this and the next decades, is to develop and introduce safe, reliable, and affordable low - to zero emission air transport for citizens and to ensure Europe's industrial leadership is maintained and strengthened throughout the relevant transition to climate-neutrality.

The COVID-19 pandemic has a major impact on the aviation industry, affecting passenger traffic, air cargo demand, airport workforce and incoming revenues. This crisis will have a lasting impact and the market will take years, perhaps a decade, to return to pre-crisis levels. The actual consequences for the sector will depend on the duration and magnitude of the outbreak and containment measures, the degree of consumer confidence for air travel, and economic conditions, etc.

Horizon Europe, the EU's future research and innovation (R&I) framework programme for 2021-2027, will include R&I activities to support civil aviation. A relevant part of these R&I activities may take place in the potential European Partnership for Clean Aviation<sup>1</sup> proposed for Horizon Europe. The main aim of the proposed Clean Aviation Joint Undertaking will be to contribute to the reduction of aviation's ecological footprint by accelerating the development of climate neutral aviation technologies. These technologies should be deployed as soon as possible, to allow for a significant contribution to the achievement of the EGD objective of no net greenhouse gas emissions by 2050, whilst ensuring high levels of safety, and maintaining the competitiveness of Europe.

The [Next Generation EU](#) recovery plan agreed by the European Council on 21 July 2020 will provide a comprehensive framework of financial support to the Member States to recover from the crisis while stimulating key investments to meet the EGD objectives and the 2050 climate neutrality goals. Horizon Europe (HE) will be reinforced with € billion to fund vital research in health, resilience and the green and digital transitions. Part of this additional amount will contribute to the recovery plan by supporting the industrial sectors mainly affected by the crisis.

The members of a broad and representative aviation stakeholders' "Preparatory Group", have prepared a Strategic Research and Innovation Agenda (SRIA)<sup>2</sup>. This contributes to the preparation of a detailed technology roadmap and a consequent action plan for the possible future Clean Aviation Joint Undertaking.

This Call for Expressions of Ideas/Potential Members (CEI) aims to open up the preparation of the potential future partnership. It calls all interested technology stakeholders who can provide transformative ideas/concepts, to contribute to the EGD goals, to express their intention to co-invest in the programme and its major demonstrator platforms in order to increase the proposed Clean Aviation Joint Undertaking impact.

The Directorate-General for Research and Innovation is looking for innovative approaches to define (with the private stakeholders) an ambitious technological roadmap, to identify the most effective pathways able to reach the desired environmental impact and to co-design the work programme of the proposed Clean Aviation Joint Undertaking, prior to its establishment, including from sectors beyond aviation.

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<sup>1</sup> Available at: <http://clean-aviation.eu/>

<sup>2</sup> Available at: [http://clean-aviation.eu/files/Clean\\_Aviation\\_SRIA%2020200630.pdf/](http://clean-aviation.eu/files/Clean_Aviation_SRIA%2020200630.pdf/)

The impact-driven and transformative character of the proposed Clean Aviation Joint Undertaking will require broadening the pool of potential participants/contributors to engage emerging technologies and solutions from all relevant scientific and technological fields.

This call for Expressions of Ideas/Potential Members is also addressed to technology suppliers and start-ups who can present topics that cover or complement the current content in the proposed SRIA, assuming they address the European Green Deal and/or the SRIA high-level objectives.

In this way, the European Commission hopes to identify new technological pathways with the highest possible expected impact on climate that show a strong potential to evolve into sustainable products and service innovations.

## **2. Objective of the Call for Expressions of Ideas/Potential Members**

The main objectives are:

- To deliver a consistent architecture, and retain innovative ideas/concepts, for implementing large-scale demonstrator projects consistent with the objective of supporting new and disruptive technologies under the proposed Clean Aviation Joint Undertaking.
- To complement the proposed SRIA, before further detailing the technical programme, with new transformative ideas/concepts from aviation and non-aviation stakeholders, including start-ups.
- To broaden further the consultation process that was started with the recent open consultation on the SRIA launched on 15<sup>th</sup> May 2020 and closed on 11<sup>th</sup> June 2020.
- To identify potential members of the future Clean Aviation Joint Undertaking that are interested to implement the proposed SRIA, have the capacity to implement multi-annual and multi-stakeholders' projects, part of an integrated programme, and are ready to embrace a long term vision of this European Partnership, which shall result in a long term commitment to it.
- To identify potential members of the future Clean Aviation Joint Undertaking who can provide new technologies/ideas complementary to the current SRIA scope of activities able to support the SRIA final outcome of low carbon/zero emission aircraft, as well as have the capacity to implement multi-annual and multi-stakeholders' projects, part of an integrated programme, and the readiness to embrace a long term vision of this European Partnership, which shall result in a long term commitment to it.
- To widen the current pool of established European aviation stakeholders with possible new interested actors able and committed to contribute in the programme and co-invest in Clean Aviation Joint Undertaking, e.g. in areas related to synergies with the other relevant potential European Public-Private Partnerships in HE, such as but not limited to:

- European Partnership for Integrated Air Traffic Management (ATM);
- European Partnership on Clean Hydrogen;
- European Partnership for Clean Energy Transition;
- European Partnership for an Industrial Battery Value Chain;
- European Partnership for Globally competitive Space Systems
- European Partnership Made in Europe;
- European Partnership for Key Digital Technologies
- European Partnership for AI, Data and Robotics.

Inputs gathered will contribute to preparing the roadmap for the implementation of the SRIA and the most promising topics to be prioritised for the first Work Programme 2021-2022 of the proposed Clean Aviation Joint Undertaking.

The results of the CEI will be used:

- to feed the R&I areas/themes that would be covered under the proposed future Clean Aviation Joint Undertaking or in other parts of HE,
- to forecast the estimated total costs and HE public funding which may be needed to support these activities,
- to identify the legal entities which may be interested to become Members of the future Clean Aviation Joint Undertaking, subject to their acceptance of the rights and obligations linked to such status<sup>3</sup>.

In case the Commission considers that an applicant may become a Member of the future Clean Aviation Joint Undertaking, that applicant will be invited to accede to the “Memorandum of Commitment” process by which stakeholders will be required to take an upfront commitment to the Clean Aviation Partnership. After the future Clean Aviation Joint Undertaking has been established by the co-legislators, the prospective Member will be asked to unconditionally accede to the Joint Undertaking by means of a letter of commitment.

The identification of the ideas/concept/potential members, as a result of the present call, will nevertheless not constitute any legal or budgetary commitment from the European Commission or from the proposed Clean Aviation Joint Undertaking.

### **3. Expected outcomes**

As indicated above, the SRIA for the future Clean Aviation Joint Undertaking has identified three key technical streams for the required R&I efforts:

- Disruptive technologies for a Hybrid Electric Regional Aircraft.
- Disruptive technologies for an ultra-efficient short and medium-range aircraft (SMR).
- Disruptive technologies to enable hydrogen-powered aircraft.

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<sup>3</sup> Members of a Joint Undertaking will be represented in the Joint Undertaking’s governance and will have to contribute to its financing, e.g. by means of financial contributions to the JU administrative costs and or in-kind contributions to operational activities (terms and conditions subject to the legislative process of the future Clean Aviation Joint Undertaking ).

These technical streams will develop technologies and enablers, leverage essential knowledge and capabilities and de-risk the identified research work where further integration, maturation, validation and demonstration is required to maximise impact. The technological streams will mainly target two pivotal aircraft demonstration programmes:

- the hybrid electric regional aircraft concept;
- the ultra-efficient short-medium range aircraft concepts.

These two aircraft demonstration programmes will enable the integration of technologies and provide a clear validation of the aircraft environmental impact achievable by 2030. They will also anticipate operational and certification issues (CS 25) of future aircraft models, which are relevant for an actual in-service introduction of the disruptive innovations.

The application of outcomes from these areas in new aircraft will depend on performance requirements for the various aircraft categories, the technological capability, the maturity and the performance gains achievable. The introduction of disruptive technologies in a timely and economically prudent manner will create the pathway to a climate-neutral aviation system.

In line with the European Green Deal and the SRIA high level objectives, through this call for expression of ideas, the European Commission is looking forward to receive innovative ideas in terms of technical approaches, linked with both operational and financial commitments, to help identify a limited number of areas where promising concrete outcomes and market uptake/deployment of products may be foreseen.

The European Commission is particularly interested in receiving ideas that exploit synergies with actors from sectors outside of traditional aviation, such as experts in full-and/or hybrid-electric power plants, hydrogen propulsion, etc. For instance, decades of experience in highly safety-critical applications of hydrogen technologies in other sectors can serve as an important stepping-stone for aviation.

Synergies can also be exploited with promising results from other EU research and innovation programmes such as ERC (European Research Council), EIT (European Institute of Technology) and EIC (European Innovation Council), and especially with other proposed EU partnership initiatives (such as batteries, hydrogen, electric systems, space systems, etc.) that can bring innovative approaches and cross cutting technologies.

The same approach applies to ideas/concepts exploiting synergies with national or regional research programmes.

Given the scale of the challenge and limited R&I resources, it is important to underline that the proposed Clean Aviation Joint Undertaking should focus on the most promising pathways and technologies that are able to foster introduction of new products and deliver impact by 2030.

#### **4. Eligibility criteria**

To be considered eligible to submit under the terms of the present call, the expression of Ideas/Potential Members will have to meet the following eligibility criterion:

- be submitted by a consortium of minimum 3 legal entities (large industry, SME, research organisation, academia, etc.) or by clusters (applying as single legal entity) which are established in EU Member State or Horizon 2020 Associate Country at the date of submission.

Non-traditional aviation stakeholders may also respond to this call for the expressions of Ideas/Potential Members. They shall demonstrate having the appropriate capabilities, configurations and skillsets needed to achieve the proposed results, to maximise research results and market impact, and meet aviation requirements (CS 23, CS 25).

In particular, applications from non-traditional aviation stakeholders are encouraged to explore possible disruptive approaches and contribute to a wider participation in the future Clean Aviation Joint Undertaking.

## **5. Criteria for assessing expressions of ideas/investors**

The proposed ideas will be assessed according to the following criteria:

### **a) Technical excellence**

*Describe the technical aspects of the demonstrator, in case of option A its link with the proposed SRIA and in particular, which part of the SRIA it proposes to cover or complement. The technical part should include defined S.M.A.R.T. objectives, a timeline, milestones, deliverables, and a complete budget overview. Where appropriate contributions shall describe how technical synergies will be promoted with activities planned under the SRIA of other proposed Partnerships under Horizon Europe and with other Union and national/regional funding programmes. The demonstration scale and targeted technical maturity shall be described in accordance to early 2030-35 entry into service as envisaged in the SRIA of the proposed Clean Aviation Joint Undertaking.*

### **b) Impact**

*Describe and justify as detailed as possible the expected impact in relation to the SRIA and aviation climate neutrality by 2050. Describe the impact at on-board systems level, as well as the socio-economic impact, and possible required changes to the infrastructure (if applicable). Provide a preliminary business and industrial roadmap leading to a credible market uptake of the proposed technologies. This analysis should take into account the emissions reductions that the developed technologies would have on individual aircraft and aircraft types, the overall impact on the complete affected fleet and market segment, and the expected speed of introduction of the technology and new products.*

### **c) Quality and efficiency of implementation**

*Include a preliminary business and industrial roadmap for co-investment in the proposed activities. Provide a description of the implementing consortium, its composition, available skillsets, the respective roles and responsibilities, and possibly required infrastructure and tools. Include an estimation of the costs to finance the R&I activities linked to your proposed contribution, as well the estimated level of total private contribution (financial and in-kind contribution) that may be brought to the proposed Clean Aviation Joint Undertaking through the execution of the proposed activities and via additional activities.*

*Provide also an estimation of the timeline and duration of the R&I activities for your proposed contribution. Provide a clear indication of the consortium composition.*

The Expression of Ideas/Potential Members should aim at concrete outcome in terms of possible market uptake by the end of 2030 and in terms of significant contribution to the achievement of the objectives of the European Green Deal.

## **6. Assessment process**

An independent ad hoc evaluation committee will assess the proposed ideas against the above-mentioned evaluation criteria.

The assessment will allow retaining the best ideas, indication of potential members and may provide recommendations for the next phase of preparing the technology roadmap for the demonstration and the definition of the Work Programme 2021-2022 of the proposed Clean Aviation Joint Undertaking.

The European Commission will take the final decision, while advice will be sought from the representatives of the European aviation industry on their compatibility with the European industrial roadmaps.

The ideas/indication on potential members retained will be considered as soon as the final decisions have been taken on HE regulation and on the legal basis for the proposed public/private partnerships.

The CEI may also be used as a valuable indication for the selection of the Founding Members, which will be listed in the basic act of the proposed Clean Aviation Joint Undertaking.

## **7. Procedure for submission of the expressions of ideas**

The **expressions of ideas** must be completed using the template provided and sent via email to: [RTD-AVIATION-CEI@ec.europa.eu](mailto:RTD-AVIATION-CEI@ec.europa.eu)

The application form must be completed in English.

Please be assured that all replies will be treated in full confidentiality and in compliance with the EU Data Protection Regulation.

## **8. Deadline for submission of expressions of ideas**

The deadline for submitting an expression of idea is 30 November 2020, 12.00, Brussels time.

Expressions of ideas submitted after the date indicated here above will not be considered.

## **9. Contact**

Dr Sebastiano Fumero, Adviser Future Air Transport.  
Directorate-General Research and Innovation, Directorate Clean Planet

[Sebastiano.Fumero@ec.europa.eu](mailto:Sebastiano.Fumero@ec.europa.eu)

## **10. Enclosures**

Expressions of Ideas/Potential Members template for submission.