



**4th Call for Proposals:
Preliminary list and description of topics**

*ANNEX CAJU-GB-2026 Amended Work Programme and
Budget 2026-2027*

Revision History Table		
Version n°	Issue Date	Reason for change
PPO	28/11/2025	Preliminary list of the Call 4 topic descriptions for the launch of the SAB/SRG consultation towards the Governing Board decision on adoption of the Amended Work Programme and Budget 2026-2027

Important notice on FAQ

Applicants are invited to submit their questions (technical and administrative) via the functional mailbox: CFP-2026-01@clean-aviation.eu

Questions will be analysed and, when appropriate, the Q&A will be published via the Funding &Tenders (F&T) Portal.

The FAQ session will open with the launch of the Call, foreseen on 17 February 2026.

Q&As are linked to the topics concerned. Applicants are therefore invited to check the topic documentation on the F&T Portal.

The closure date of the FAQ will be clearly stated on the F&T Portal.

Contents

CALL 4 TOPIC ABSTRACTS	6
TRANSVERSE TOPICS	11
HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01: Hydrogen powered aircraft concept and key technologies integration and impact assessment	11
HORIZON-JU-CLEAN-AVIATION-2026-04-TRA-01 Demonstration and Validation of icing Certification Methodologies compatible with EIS2035 for the SMR and REG Aircraft	19
HORIZON-JU-CLEAN-AVIATION-2026-04-CSA-01: Operational stakeholders' group to support the deployment of Clean Aviation aircraft concepts and technologies.	28
ULTRA-EFFICIENT REGIONAL AIRCRAFT TOPICS	34
HORIZON-JU-CLEAN-AVIATION-2026-04-REG-01: Demonstration of advanced airframe for ultra-efficient regional aircraft	34
SHORT AND MEDIUM-RANGE AIRCRAFT TOPICS	45
HORIZON-JU-CLEAN-AVIATION-2026-04-SMR-01 Demonstration of an Optimized Systems Platform for Ultra-efficient SMR Aircraft	45
HORIZON-JU-CLEAN-AVIATION-2026-04-SMR-02 Demonstration of an Ultra-Efficient Rear Fuselage and Empennage and Its Integrated Industrial System enabling EIS2035 for the SMR Aircraft	54
HORIZON-JU-CLEAN-AVIATION-2026-04-SMR-03 Ground Demonstration of Hybrid-Electric Propulsion Architectures for the Ultra-efficient SMR aircraft	64
HYDROGEN POWERED AIRCRAFT TOPICS	74
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-01 Demonstration of advanced FC propulsion techno-bricks for the fully-electric hydrogen fuel cell aircraft concept	74
HORIZON-JU-CLEAN-AVIATION- 2026-04-HPA-02: Demonstration of an integrated hydrogen fuel system for a fully electric hydrogen fuel cell powered aircraft	85
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-03 Demonstration of an advanced Low NOx H ₂ C Propulsion System for the direct hydrogen combustion aircraft concept	96
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-04: Demonstration of a hydrogen distribution system for a direct hydrogen combustion propulsion aircraft	106
FAST-TRACK ACTIVITIES TOPICS (FTA)	116
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-01: Demonstration of low power Ice Protection System technology	116
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-02: Demonstration of cabin acoustic optimisation technology	122
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-03 Advanced noise-reducing technologies for propulsion systems of next generation Ultra-efficient SMR aircraft	128
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-04 Key Technologies for Loads Control Lidar for Ultra-efficient SMR aircraft	133
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-05 Cryo-cooled power electronics for a fully electric hydrogen powered aircraft	138
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-06 Superconducting motor windings for a fully electric hydrogen fuel cell powered aircraft	144
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-07 Innovative lightweight and reliable liquid hydrogen tank	150

List of Topics for Calls for Proposals

Identification Code	Title	Type of Action	Ind. Value (Funding in M€)
Transverse topics			
HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01	Hydrogen powered aircraft concept and key technologies integration and impact assessment	IA	6
HORIZON-JU-CLEAN-AVIATION-2026-04-TRA-01	Demonstration and Validation of icing Certification Methodologies compatible with EIS2035 for the SMR and REG Aircraft	IA	12
HORIZON-JU-CLEAN-AVIATION-2026-04-CSA-01	Operational stakeholders' group to support the deployment of Clean Aviation aircraft concepts and technologies	CSA	0.5
Ultra-efficient regional aircraft topic			
HORIZON-JU-CLEAN-AVIATION-2026-04-REG-01	Demonstration of advanced airframe for ultra-efficient regional aircraft	IA	40
Short and medium-range aircraft topics			
HORIZON-JU-CLEAN-AVIATION-2026-04-SMR-01	Demonstration of an Optimized System Platform for Ultra-efficient SMR Aircraft	IA	30
HORIZON-JU-CLEAN-AVIATION-2026-04-SMR-02	Demonstration of an Ultra-Efficient Rear Fuselage and Empennage and Its Integrated Industrial System enabling EIS2035 for the SMR Aircraft	IA	40
HORIZON-JU-CLEAN-AVIATION-2026-04-SMR-03	Ground Demonstration of Hybrid-Electric Propulsion Architectures for the Ultra-efficient SMR aircraft	IA	60
Hydrogen Powered aircraft topics			
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-01	Demonstration of advanced FC propulsion techno-bricks for the fully electric hydrogen fuel cell aircraft concept	IA	50
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-02	Demonstration of an integrated hydrogen fuel system for a fully electric hydrogen fuel cell powered aircraft	IA	18
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-03	Demonstration of Advanced Low NOx H2C Propulsion System for the direct hydrogen combustion aircraft concept	IA	15
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-04	Demonstration of a hydrogen distribution system for a direct hydrogen combustion propulsion aircraft	IA	18
Fast Track Activities topics			
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-01	Demonstration of low power Ice Protection System technology	RIA	5
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-02	Demonstration of cabin acoustic optimization technology	RIA	5

Identification Code	Title	Type of Action	Ind. Value (Funding in M€)
Transverse topics			
HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01	Hydrogen powered aircraft concept and key technologies integration and impact assessment	IA	6
HORIZON-JU-CLEAN-AVIATION-2026-04-TRA-01	Demonstration and Validation of icing Certification Methodologies compatible with EIS2035 for the SMR and REG Aircraft	IA	12
HORIZON-JU-CLEAN-AVIATION-2026-04-CSA-01	Operational stakeholders' group to support the deployment of Clean Aviation aircraft concepts and technologies	CSA	0.5
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-03	Advanced noise-reducing technologies for propulsion systems of next generation Ultra-efficient SMR aircraft	RIA	5
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-04	Key Technologies for Loads Control Lidar for Ultra-efficient SMR aircraft	RIA	5
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-05	Cryo-cooled power electronics for a fully electric hydrogen powered aircraft	RIA	5
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-06	Superconducting motor windings for a fully electric hydrogen fuel cell powered aircraft	RIA	5
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-07	Innovative light weight and reliable liquid hydrogen tank	RIA	5
			329.5M€
TOTAL	18 topics		

CALL 4 TOPIC ABSTRACTS

TRANSVERSE	
Topic ID / Funding	Topic Title / Abstract
HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01	Hydrogen powered aircraft concept and key technologies integration and impact assessment
Innovation Action (IA) Call 4- 6 M€ Up to 2 projects expected	Integration and performance assessment of the fully electric hydrogen fuel cell powered aircraft and the direct hydrogen combustion propulsion aircraft concepts introduced in the CAJU SRIA. The topic covers the integration and co-ordination of CAJU key technology projects into a comprehensive aircraft concept at TRL4, demonstrating the viability of the aircraft concept and delivering a performance, emissions and maturity assessment.
HORIZON-JU-CLEAN-AVIATION-2026-04-TRA-01	Demonstration and Validation of icing Certification Methodologies compatible with EIS2035 for the SMR and REG Aircraft
Innovation Action (IA) Call 4– 12 M€ Up to 1 project expected	Development and demonstration of harmonized icing certification methodologies for Appendix O Supercooled Large Droplet (SLD) Icing conditions. The topic covers validation of numerical prediction tools against representative test results and creation of a means of compliance and regulatory roadmap in close collaboration with EASA and other aviation authorities to support efficient future certification process enhancing aviation safety and ensuring EIS 2035 for the Ultra-Efficient SMR and Regional aircraft.
HORIZON-JU-CLEAN-AVIATION-2026-04-CSA-01	Operational stakeholders' group to support the deployment of Clean Aviation aircraft concepts and technologies
Coordination and support action (CSA) Call 4– 0.5 M€ Up to 1 project expected	Support action to form of a group of operators tasked to assess the operational implications of the innovative aircraft concepts and disruptive technologies addressed by the Clean Aviation programme. Operational gaps and risks will be identified and recommendations delivered to the Clean Aviation JU and project coordinators, to ensure adequate anticipation and favour a seamless deployment of technology in operations from 2035.
Total Call 4: 18.5 M€	

Ultra-Efficient Regional Aircraft (REG)	
Topic ID / Funding	Topic Title / Abstract
HORIZON-JU-CLEAN-AVIATION-2026-04-REG-01	Demonstration of advanced airframe for ultra-efficient regional aircraft
Innovation Action (IA) Call 4– 40 M€ Up to 1 project expected	Development and demonstration of an advanced airframe, including the wing, fuselage, empennage, and key enabling systems, for the Ultra-Efficient Regional Aircraft concept based on hybrid-electric propulsion. The topic targets a 10% CO2 reduction contribution from airframe technologies compared to 2020 state-of-the-art, and covers ground demonstrations to TRL6, supporting an entry into service by 2035.
Total Call 4: 40M€	

Short and Medium Range Aircraft (SMR)	
Topic ID / Funding	Topic Title / Abstract
HORIZON-JU-CLEAN-AVIATION- 2026-04-SMR-01	Demonstration of an Optimized System Platform for Ultra-efficient SMR Aircraft
Innovation Action (IA) Call 4– 30 M€ Up to 1 project expected	Development and demonstration of an optimized systems platform enabling the next-generation Ultra-Efficient SMR aircraft. The topic aims to integrate high-performance computing, electrical power and data architectures into a unified, certifiable platform, supporting advanced functions such as active control, hybridisation and predictive maintenance by means of a representative ground demonstration at TRL6 validating performance, safety and cybersecurity, with clear pathways to CRL4 and future maturation towards aircraft integration and EIS 2035.
HORIZON-JU-CLEAN-AVIATION- 2026-04-SMR-02	Demonstration of an Ultra-Efficient Rear Fuselage and Empennage and Its Integrated Industrial System enabling EIS2035 for the SMR Aircraft
Innovation Action (IA) Call 4– 40M€ Up to 1 project expected	Development and demonstration of an Ultra-Efficient Rear Fuselage and Empennage (RFE) and its integrated industrial system for the Ultra-Efficient SMR Aircraft. This topic targets the delivery of a RFE full component assembly alongside an Industrial system including advanced manufacturing and assembly processes supporting the high-rate production of such structural components at TRL6, with an aim to significantly reduce the weight at component level and increase competitiveness through co-development of product and production processes, ensuring a clear route towards certification, exploitation and industrialisation for EIS 2035.
HORIZON-JU-CLEAN-AVIATION- 2026-04-SMR-03	Ground Demonstration of Hybrid-Electric Propulsion Architectures for the Ultra-efficient SMR aircraft
Innovation Action (IA) Call 4– 60M€ Up to 3 projects expected	Development and demonstration of hybrid-electric propulsion architectures for the Ultra-Efficient SMR aircraft. This topic covers the demonstration of hybrid-electric sub-systems integrated into ducted or unducted engines at TRL5 through ground demonstrations with an aim to demonstrate the benefits from such propulsion architectures targeting at least 5% CO2 emissions reduction at aircraft level, with a clear roadmap towards TRL6 by 2030 supporting a future product launch compatible with an EIS by 2035.
Total Call 4: 130 M€	

Hydrogen Powered Aircraft (HPA)	
Topic ID / Funding	Topic Title / Abstract
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-01	Demonstration of advanced FC propulsion techno-bricks for the fully electric hydrogen fuel cell aircraft concept
Innovation Action (IA) Call 4– 50 M€ Up to 1 project expected	Development and demonstration of the critical components and sub-system of a hydrogen fuel cell engine for the fully electric hydrogen fuel cell powered aircraft concept. This project will deliver and demonstrate the components and sub-systems on ground at TRL5, for a lightweight, compact and efficient fuel cell engine, demonstrated at TRL4, enabling a viable hydrogen fuel cell powered aircraft concept.
HORIZON-JU-CLEAN-AVIATION- 2026-04-HPA-02	Demonstration of an integrated hydrogen fuel system for a fully electric hydrogen fuel cell powered aircraft
Innovation Action (IA) Call 4– 18 M€ Up to 1 project expected	Development and demonstration of the integrated hydrogen fuel system, from the hydrogen tank pressure management system to the hydrogen distribution and conditioning system, for a fully electric hydrogen fuel cell powered aircraft. This topic targets the demonstration of the critical distribution and hydrogen conditioning components, at TRL5, and the on-ground demonstration of the integrated fuel distribution system, at TRL4.
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-03	Demonstration of Advanced Low NOx H2C Propulsion System for the direct hydrogen combustion aircraft concept
Innovation Action (IA) Call 4– 15 M€ Up to 1 project expected	Development and demonstration of an advanced low NOx hydrogen direct combustion propulsion system. This topic targets the demonstration of a low NOx combustor at TRL5, delivering minimum 30% reduction of NOx and demonstrating the combustor operability and integrity, and an efficient and hydrogen combustion engine architecture at TRL4, enabling the demonstration of a viable direct hydrogen combustion aircraft concept.
HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-04	Demonstration of a hydrogen distribution system for a direct hydrogen combustion propulsion aircraft
Innovation Action (IA) Call 4– 18 M€ Up to 1 project expected	Development and demonstration of the hydrogen distribution and conditioning system, from the tank interface until the combustor, for a direct hydrogen combustion propulsion aircraft. This topic targets the demonstration of the critical distribution and hydrogen conditioning components, including the high-pressure hydrogen pump, at TRL5, and the on-ground demonstration of the fuel distribution system at TRL4. The project will perform a scaled-on ground demonstration of the engine thrust control function.
Total Call 4: 101 M€	

Fast-Track Activities (FTA)	
Topic ID / Funding	Topic Title / Abstract
HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-01	Demonstration of low power Ice Protection System technology
Research and Innovation Action (RIA) Call 4– 5 M€ Up to 1 project expected	Development and demonstration of a low power Ice Protection System for the wing and empennage of an Ultra-Efficient Regional Aircraft concept based on hybrid-electric propulsion. The topic covers ground demonstrations to TRL5 representative of EASA CS-25 icing conditions and targets a lightweight and low drag solution compatible with regional aircraft

	non-propulsive power levels.
HORIZON-JU-CLEAN-AVIATION- 2026-04-FTA-02	Demonstration of cabin acoustic optimization technology
Research and Innovation Action (RIA) Call 4– 5 M€ Up to 1 project expected	Development and demonstration of innovative acoustic treatment technologies ensuring the cabin noise mitigation for an Ultra-Efficient Regional Aircraft concept based on hybrid-electric propulsion. The topic covers ground demonstrations to TRL5 in representative noise and vibration environment and targets a lightweight and low volume solution compatible with the integration on a regional aircraft.
HORIZON-JU-CLEAN-AVIATION- 2026-04-FTA-03	Advanced noise-reducing technologies for propulsion systems of next generation Ultra-efficient SMR aircraft
Research and Innovation Action (RIA) Call 4– 5 M€ Up to 1 project expected	Development and demonstration of advanced noise-reducing and lightweight technologies for UHBR propulsion systems on the Ultra-Efficient SMR aircraft concept. The topic aims to mature distortion-tolerant fan and intake solutions supported by improved and validated aero-acoustic modelling to TRL5 with an aim to achieve cumulative noise reduction and structural weight benefits.
HORIZON-JU-CLEAN-AVIATION- 2026-04-FTA-04	Key Technologies for Loads Control Lidar for Ultra-efficient SMR aircraft
Research and Innovation Action (RIA) Call 4– 5 M€ Up to 1 project expected	Development and demonstration of key lidar technologies enabling a feed-forward Gust Load Alleviation (GLA) system for the Ultra-Efficient SMR aircraft. This topic aims to mature critical lidar sub-systems and system integration approaches in representative airborne conditions with an aim to demonstrate reliable ahead of the aircraft turbulence detection and system compatibility with flight control architectures, supporting load reduction and structural weight benefits.
HORIZON-JU-CLEAN-AVIATION- 2026-04-FTA-05	Cryo-cooled power electronics for a fully electric hydrogen powered aircraft
Research and Innovation Action (RIA) Call 4– 5 M€ Up to 1 project expected	Development and demonstration of a cryo-cooled motor inverter power electronics at TRL5, for a fully electric hydrogen fuel cell powered aircraft. This topic aims to demonstrate their reliability and performance, enabling the development of more efficient, compact and scalable cryogenic electric propulsion systems
HORIZON-JU-CLEAN-AVIATION- 2026-04-FTA-06	Superconducting motor windings for a fully electric hydrogen fuel cell powered aircraft
Research and Innovation Action (RIA) Call 4– 5 M€ Up to 1 project expected	Development and demonstration of a superconducting alternating current motor winding at TRL5, for a fully electric hydrogen fuel cell powered aircraft. This topic aims to demonstrate their reliability and performance, enabling the development of more efficient, compact and scalable cryogenic electric propulsion systems.
HORIZON-JU-CLEAN-AVIATION- 2026-04-FTA-07	Innovative light weight and reliable liquid hydrogen tank
Research and Innovation Action (RIA) Call 4– 5 M€ Up to 1 project expected	Develop and demonstrate an innovative lightweight and reliable liquid hydrogen tank concept, for integration into hydrogen powered aircraft concepts. The topic aims to demonstrate a reliable and safe hydrogen tank design at TRL4, with a gravimetric index no less than 40% a dormancy no less than 12hours, demonstrated through on ground cryogenic and tightness testing.

Total Call 4: 40M€¹

¹ One project per topic, with funding reserved for an additional one based on the outcome of the evaluation

TRANSVERSE TOPICS

HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01: Hydrogen powered aircraft concept and key technologies integration and impact assessment

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 6 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 2 projects with funding depending on the outcome of the evaluation and the alignment of the proposed actions.</p> <p>In the selection of projects to be retained for funding, strong consideration will be given to the comprehensiveness and complementarity of the proposed actions, ensuring the broadest coverage of aircraft types and their payload/range capability. The project may address one or more aircraft concepts for either a fully electric hydrogen powered aircraft or for a direct hydrogen combustion propulsion hydrogen aircraft as identified in the Clean Aviation Strategic Research and Innovation Agenda.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution for each of the projects is EUR 3 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Special eligibility condition applicable to the coordinator	<p>Considering the outcome expected from the topic requiring capabilities to integrate, to perform assessment and to support certification of aircraft technologies on to aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and Clean Aviation SRIA, the coordinator's role shall be performed by an European based aircraft integrator aiming at designing, developing, manufacturing and certifying regional or short-medium range aircraft.</p>
Indicative project duration	Maximum 48 months.
Type of Action	Innovation Action.
Technology Readiness Level	<p>In the second phase of the programme, a second design iteration of the critical systems will be performed, supporting both the fuel cell-based propulsion aircraft concept and a hydrogen combustion powertrain aircraft concept defined in the SRIA. The EIS of these aircraft concepts is expected to be in 2040s (instead of 2035 as previously indicated in the SRIA) due to the shift of the ambition announced in 2025 linked to the lack of maturity of the whole ecosystem.</p> <p>In this context, activities in this call for proposals are expected to achieve TRL4 for critical technologies for the aircraft concepts considered, as indicated in section 'Expected Outcome', and will aim to expand and strengthen the ecosystem, fostering innovation and collaboration across the entire value chain.</p> <p>A minimum TRL3 at project start for the considered technologies based on synergies with activities from Clean Aviation, and other national, regional, and European programmes.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to demonstrate the viability of a hydrogen aircraft concept.</p>

	See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.
Certification Readiness Level	<p>Activities are expected to demonstrate a CRL4 at project completion, for critical technologies. A route to achieve CRL6 at propulsion system level must be defined as part of the project, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft concepts.</p> <p>A guide to the CRL definitions and criteria to be used is available on EASA website².</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include aircraft integrators and their supply chain with a proven track record in developing and delivering globally competitive aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development. The consortium configuration should ensure an appropriate diversity of the participants (encompassing a range of skills and organisation types), while also considering the industrial, economic and supply chain interests are adequately represented in the project and can ensure the transition from research to product innovation and market deployment, supporting the development of the ecosystem.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and of regional aircraft at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p>
Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concepts related to direct hydrogen combustion propulsion aircraft or the fully electric hydrogen fuel cell propulsion aircraft.</p> <p>The JU Members participating in the topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement(s)	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first and second CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p>

² <https://www.easa.europa.eu/en/document-library/application-services/innovation-services#goodtoknow>

	A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal) in the call topic's documents.
Impact Monitoring	<p>Under the Impact Monitoring framework, the participants selected in this topic are expected to collect all necessary data from all other relevant projects including those selected from this call, but not limited to those, that are contributing to the aircraft concept proposed</p> <p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact Monitoring mechanism as described in the Clean Aviation SRIA and the Amended Work Programme and Budget 2026-2027 by assessing the progress of the activity towards the targeted impact and performance at overall aircraft level, integrating the relevant information and data provided by the projects to be selected as part of the Call for Proposals.</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report on yearly basis by means of specific deliverables included in the project in alignment with the CAJU Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/20853. Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.</p>
Project Monitoring	The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-milestones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.
In-kind contributions (IKOP/IKAA by JU Members; co-funding by other applicants)	<p>In order to ensure the obligations for in-kind contributions by Members of the CAJU (i.e. "Founding Member", "Associated Member" and affiliated entities to a Member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/20854, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. "Founding Member", "Associated Member" and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to operation activities and in-kind contribution to additional activities) should be no less than 1.5 times the funding request in aggregate for the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/20856, only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a "Member" of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the</p>

	project and to the programme/Strategic Research and Innovation Agenda at large.
Other relevant projects	<p>This project should run in close cooperation and synchronization with other relevant projects that will be selected under this Call for Proposals as well as with relevant ongoing projects selected under the first and second CAJU Call for Proposals³:</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027 and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first and second CAJU Call for Proposal; - draw up in their proposal a list of projects selected under the first and second call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal's objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6. <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts' evaluation.</p> <p>For further information, please also consult the Rules for Submission, evaluation and selection and the dedicated part in the Amended Work Programme and Budget 2026-2027.</p>
Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft concepts embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p> <p>Applicants are requested to prepare a route to certification with inclusion of the Clean Aviation contributing topics to the aircraft concepts activities, in view of defining a detailed description of the project technical activities for route to certification.</p> <p>Applicants are requested to establish contact with EASA in view of defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal together with an estimate of the budget to cover EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL</p>

³ https://clean-aviation.eu/sites/default/files/2022-03/CAJU-GB-2022-03-16%20Annex-Call-1-topics-descriptions_published.pdf and https://clean-aviation.eu/sites/default/files/2023-04/CAJU-GB-Writ%20proc%202023-01%20Annex%20Call%202%20topics%20_published.pdf

	<p>scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of the call.</p>
--	--

Expected Outcome:

Project results are expected to provide or contribute to the following expected outcomes:

- **Develop and deliver a viable hydrogen powered aircraft concepts** , with the aim to **achieve up to TRL4 for critical technologies for the aircraft concepts considered** at project end with the potential for exploitation in the 2040s.
 - The criteria for the demonstration of the aircraft concept viability criteria shall be defined as part of the proposal and shall be based as a minimum , on an energy efficiency comparison with an equivalent reference kerosene 2020 state-of-the-Art aircraft and a techno-economic assessment.
 - For each aircraft concept, a comprehensive integration assessment of all key contributing technologies and systems shall be performed. Critical technologies developed under other funding programmes and contributing to the overall aircraft architecture definition, shall be included in the integration assessment.
 - An adequate number of meaningful design iterations shall be performed to assess the evolution of the aircraft and technology development.
 - A description of the aircraft concept architecture, including a description of the main aircraft components and the critical and enabling technologies characteristics (including those critical technologies developed outside clean aviation) shall be delivered.
 - A concept ranking and concept selection study to down select the most viable aircraft concepts and technologies shall be performed.
 - The decision-making mechanism used to perform the concept ranking and down selection must be defined as part of the project proposal. Aircraft performance,

industrialisation, maintenance, competitiveness and sustainability criteria should be considered among others deemed relevant by the applicant, .

- The technological and potential industrial readiness of innovations shall be considered in support of the launch of disruptive new aircrafts in the 2040s.
- Achieve a Certification Readiness Level 4 (CRL) for selected aircraft concepts (related to activities part of Clean Aviation), and identify a route to contribute to achieving CRL6.
 - A plan to support the CRL4 achievement, including activities being either inside or outside Clean Aviation should be provided.
 - The results and progress related to activities implemented in Clean Aviation on the certification readiness must be regularly monitored and reported.
 - Confirmation of the CRL progress (encompassing IPC and other contributions) and CRL achievements by the end of the programme at aircraft concept level should be provided.
 - The operational requirements to support successful entry into service should be identified.
- **Assess and monitor on a yearly basis**, the overall aircraft performance and the contribution of the aircraft components and technologies to the achievement of the Clean Aviation SRIA objectives and the topic performance targets.
 - The proposals shall deliver quantitative performance based on a high-fidelity model for the various integrated aircraft concepts, in line with the impact monitoring framework defined in the first phase (2022-2026) of the Clean Aviation programme. Key parameters needed to assess energy efficiency, CO₂⁴, non-CO₂ emissions (including NO_x, hydrogen fugitive and operational leaks, water ,non-volatile Particulate Matter emissions, and other relevant parameters for contrails formation assessment) and noise emissions, to ensure compliance with future regulations shall be included.
 - This assessment should be performed for the full typical mission profile, reporting on the various emissions species and noise with sufficient level of granularity. Reporting should support the viability assessment of the aircraft based on energy efficiency criteria and a climate assessment of any non-CO₂ emissions with a potential GHG effect⁵ identified by the applicant .A sensitivity assessment should be performed to understand the key model and technology parameter drivers.
 - The same performance modelling methodology shall apply to all aircraft concepts of the same category. The performance modelling shall rely on industrial tools or on tools where evidence of the actual validation of industrial models is demonstrated.
 - The monitoring and reporting should be aligned with the Impact monitoring process defined in the first phase (2022-2026) of the Clean Aviation programme. The aircraft concept topics will aggregate all contributions and will coordinate the monitoring of the Clean Aviation impact for their aircraft concepts address in the Clean Aviation Strategic Research and Innovation Agenda and report the status in a yearly basis.
- Ensure proper coordination, as **aircraft architect and integrator**, between the contributing projects to the different aircraft concepts, ensuring that:
 - Requirements, interfaces and other reference documents are up-to-date and

⁴ Aircraft tailpipe CO₂ emissions should only be assessed if a dual fuel hydrogen / SAF concept is considered

⁵ Calculated at mission level in kg/ASK (available seat kilometer) and demonstrated in compliance with ICAO/CAEP emissions regulation. Engine emissions characteristics against ICAO Annex 16

there is alignment in terms of TLARs (Top Level Aircraft Requirements) and performance data to support the critical technologies design and demonstration activities.

- Proper arrangements to regularly report performances and maturity progress of the proposed aircraft concepts are provisioned.
- An integrated aircraft concept and technology development plan is issued at the beginning of the project and updated on a regular basis to reflect interfaces and exchanges of information with contributing projects.
- The end-to-end decision-making process and technology performance modelling with full data continuity is sufficiently documented.

Scope:

The second phase of Clean Aviation (2026-2030) will concentrate on integration and demonstration of technologies into hydrogen powered aircraft concepts, or combined with Sustainable Aviation fuel (SAF) in a dual fuel application⁶.

From the aircraft concepts proposed as part of Clean Aviation SRIA, this topic shall focus on the following aircraft configurations:

- A direct hydrogen combustion propulsion aircraft concept with 100-150 pax capacity and a design range up to 1400NM.
- A fully electric hydrogen fuel cell powered aircraft concept with 100 pax capacity and a design range up to 1000NM.

The proposed concepts at the start should depart from aircraft concepts and technologies developed under the first phase (2022-2026) of the Clean Aviation programme, and/or funded by national/regional or other European programmes⁽¹⁾ with a minimum technology maturity of TRL3.

The proposals shall explore the most promising routes around various aircraft concepts and critical technologies having the potential to deliver an energy efficient viable aircraft concept. Selected aircraft concepts should meet a technology readiness level of TRL4 (for critical technologies) and demonstrate a route to a certification readiness level of CRL4 by the end of the programme.

Additional technologies in which a high level of innovation and promising benefits are expected (E.g.: superconductivity and cryocooling electronics) , should also be integrated and demonstrated to keep some alternative solutions enabling more ambitious higher efficiency aircraft concepts .

With regards to certification, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path.. A CRL6 roadmap at aircraft level should be defined by the end of the project. The aircraft concept integration topic shall lead the regulatory discussions with the objective to minimise the number of contracts and interfaces with the certification authorities. Exchange of sufficient technical knowledge to feed the regulatory discussions between the techno project and the aircraft concept topic should be established.

With the aim to define the route to exploitation, an operational assessment should be performed to support the successful deployment and continuous operation of future hydrogen powered aircrafts, including ground operations, repairability and maintainability.

The project is required to exploit the involvement and expertise of EASA in the proposal to de-risk and secure the certification of novel aircraft concepts with the aim to assess and define how the envisaged solutions will have the potential for certification (ref. topic conditions related to “Involvement of

⁶ Dual fuel application considered only for the direct combustion propulsion aircraft concept

EASA”).

The project shall identify and implement synergies with activities funded under research and innovation programmes at regional⁷, national⁸ and European⁹ level, and demonstrate how the project will benefit from these activities by detailing the specific contributions to the expected outcomes.

Performance Targets:

A number of top-level goals for the hydrogen powered aircraft concepts will be the basis for the performance targets, in particular:

- An aircraft concept **energy efficiency**¹⁰, comparable to kerosene alternatives. . The proposals should establish the energy efficiency target to define the commercial viability of the potential aircraft concept. The energy efficiency contribution at aircraft level for the different aircraft components and technologies should be provided.
- The evaluation, monitoring and reporting of key parameters needed to **assess non-CO2 effects** (including NOx, water vapour, hydrogen fugitive and operational leakages¹¹, and non-volatile Particulate Matter emissions), to ensure compliance with foreseen regulations and standards for the expected potential EIS date.
- **Noise emissions levels** fully compliant with ICAO noise standard (chapter 14 noise limits), with adequate certification cumulative noise level margin, while considering future updates to the noise standard for the expected potential EIS date.

The top-level goals shall be broken down in a consistent manner at the different levels: from top-level aircraft requirements to the main aircraft systems level requirements. Pertinent performance targets including Key Performance Indicators (KPIs) shall be derived at each level.

The performance targets, including KPIs, should be defined and calibrated with the objective of meeting or exceeding the project goals at completion, allowing efficient progress monitoring and providing a sound basis for subsequent work in view of best contributing to the achievement of overall high-level goals.

These targets must be achievable while ensuring compatibility with safety, reliability, economics, and sustainability objectives. The top level goals shall be broken down in a consistent manner at the different levels, from aircraft top level requirements to the different aircraft critical components and sub-systems.

The performance targets shall be identified in the proposal (as preliminary requirements). For projects retained for funding this flow-down requirements from aircraft concept level to system level shall be provided to and agreed with the contributing other relevant projects. All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹² objectives. All data required to characterize emissions (including non-CO₂ effects and noise) shall be modelled and measured as required to perform aircraft level impact assessment.

Proposals shall include a project plan with key milestones and deliverables, together with a list of performance targets per critical technologies associated with this plan.

⁷ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

⁸ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

⁹ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

¹⁰ compared to comparable 2020 state-of-the-art aircraft available in service and measured as the fuel energy equivalent

¹² S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

HORIZON-JU-CLEAN-AVIATION-2026-04-TRA-01 Demonstration and Validation of icing Certification Methodologies compatible with EIS2035 for the SMR and REG Aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 12 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 12 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Indicative project duration	Maximum 36 months.
Type of Action	Innovation Action.
Technology Readiness Level	<p>A minimum TRL4 shall be justified at project start for the considered technologies based on synergies with activities from Clean Aviation, Clean Sky 2, and other national, regional, and European programmes.</p> <p>Activities are expected to achieve TRL 6 at numerical prediction tools level at project completion, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap (aligned with the Clean Aviation SRIA and with the objectives as defined in the Amended Work Programme and Budget 2026-2027) that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft with an entry into service by 2035.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Certification Readiness Level	<p>Activities are expected to achieve CRL5 for Regulatory Roadmap and Certification Methodologies at project completion with a clear pathway to CRL6 by 2030, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft with an entry into service by 2035.</p> <p>A guide to the CRL¹³ definitions and criteria to be used is available on the Funding & Tenders portal (F&T portal).</p>

¹³ Certification Readiness Level: <https://www.easa.europa.eu/en/newsroom-and-events/news/research-innovation-updates-research-agenda-and-certification-readiness>

Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include aircraft manufacturers, airframe and system integrators, and their supply chain with a proven track record in developing and delivering globally competitive systems to aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development.</p> <p>The consortium configuration should ensure the appropriate industrial, economic and supply chain interests are represented in the project and can ensure the transition from research to product innovation and market deployment by 2035, and with a clearly articulated route that supports the aim of replacing 75% of the operating fleet by 2050.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and certification in the aeronautical supply chain of short-medium range aircraft at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p>
Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concepts related to short-medium range aircraft.</p> <p>The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first, second and third CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other</p>

	<p>relevant projects”.</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal).</p>
Impact Monitoring	<p>Under the Impact Monitoring framework as defined in the Amended Work Programme and Budget 2026-2027, the participants selected in this topic shall contribute to the Ultra-efficient SMR Aircraft Concept and to exchange all relevant information and data with short-medium range aircraft concept project AClandI (GA n. 101255025) and to the Ultra-Efficient Regional Aircraft Concept and to exchange all relevant information and data with UERA concept project HERACLES (GA n. 101256949).</p> <p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact Monitoring mechanism as described in the Clean Aviation SRIA and the Amended Work Programme and Budget 2026-2027 by providing a performance assessment model of the key technologies, sub-systems or systems for possible integration on the future aircraft concept model developed in the short-medium range aircraft concept project AClandI (GA n. 101255025) and for the regional aircraft concept in the UERA concept project HERACES (GA n. 01255025).</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report the progress against the defined performance objectives on a yearly basis by means of specific deliverables included in the project in alignment with the CAJU Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/2085¹⁴. Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.</p>
Project Monitoring	<p>The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-millstones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>
In-kind contributions	<p>In order to ensure the obligations for in-kind contributions by Members</p>

¹⁴ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

(IKOP/IKAA by JU Members; co-funding by other applicants)	<p>of the CAJU (i.e. “Founding Member”, “Associated Member” and affiliated entities to a Member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/2085¹⁴, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. “Founding Member”, “Associated Member” and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to operation activities and in-kind contribution to additional activities) should be no less than 1.5¹⁵ times the funding request in aggregate for the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/2085¹⁶, only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a “Member” of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the project and to the programme/Strategic Research and Innovation Agenda¹⁷ at large.</p>
Other relevant projects	<p>This project should run in close cooperation and synchronization with relevant Clean Aviation projects AClandI (GA n. 101255025) and HERACLES (GA n. 101256949) and those that will be selected under this CfP.</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027, and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first, second and third CAJU CfP; - draw up in their proposal a list of projects selected under the first, second and third call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal’s objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and

¹⁵ In order to support a leverage factor of no less than the ratio between the contribution from members other than the Union (EUR 2 400 000 000) and the Union financial contribution (EUR 1 700 000 000), which are defined in the Council Regulation (EU) 2021/2085

¹⁶ Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014

¹⁷ <https://clean-aviation.eu/sites/default/files/2024-09/2024-Clean-Aviation-SRIA.pdf>

	<p>the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6.</p> <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts' evaluation.</p> <p>For further information, please also consult the Rules for Submission, evaluation and selection and the dedicated part in the Amended Work Programme and Budget 2026-2027.</p>
Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p> <p>Applicants are requested to establish contacts with the short-medium range and regional aircraft concept owner¹⁸ (i.e. consortium leaders of projects AClandl (GA n. 101255025) and HERACLES (GA n. 101256949)) in view of defining a detailed description of the project technical activities for route to certification. The route to certification should be focused on the certification aspects considered crucial for de-risking the exploitation route.</p> <p>Applicants are requested to establish contact with EASA in view of defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal with an estimate of the budget to cover EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already</p>

¹⁸ The owner of Clean Aviation aircraft concepts are the project coordinators defined in the topic conditions of HORIZON-JU-CLEAN-AVIATION-2025-03-ACI-01: "Aircraft concept and key technologies integration and impact assessment", which is launched as part of this CfP. Please also refer to the Clean Aviation integrated roadmaps published in the CAJU Amended Work Programme 2026-2027.

	<p>in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of the call.</p>
--	--

Expected Outcome:

Project results are expected to contribute directly to European aviation safety and certification objectives for the next generation Ultra-efficient Short and Medium Range (SMR) and Ultra-efficient Regional (REG) aircraft concepts by delivering harmonized methodologies for Appendix O¹⁹ Supercooled Large Droplet (SLD) Icing. The results will support future Acceptable Means of Compliance, reduce Certification effort, accelerate the Certification process and support the next generation of SMR and REG aircraft concepts with an EIS by 2035 to be safe. Applicants shall ensure the publication of relevant results to enable harmonization of certification rules with other certification authorities, following alignment with EASA.

SLD conditions introduce severe aerodynamic penalties and ice-accretion behaviours that are not yet adequately considered by current certification means. These challenges are equally critical for the targeted REG and SMR aircraft, where the former operates for a longer duration within icing layers and the latter is characterized by the new laminar wing and hybrid-propulsion configurations.

Projects are expected to achieve the following outcomes addressing the Ultra-efficient SMR and REG aircraft concepts considered in Clean Aviation:

- Deliver validated numerical and physics-based and AI-assisted SLD icing prediction tools to support system-level demonstration at TRL6 with quantified uncertainties and traceable validation against experimental and flight test²⁰ data.
- Deliver a comprehensive validation database of ice-accretion shapes and related aerodynamic effects covering representative SMR and REG aircraft flight envelopes.
- Deliver a draft Acceptable Means of Compliance (MoC) for Appendix O (SLD) Icing conditions developed in collaboration with EASA and other major aviation authorities.

¹⁹ Certification Specifications on Appendix O & C can be found in the CS-25 Amendment 28 on this link: <https://www.easa.europa.eu/en/downloads/139073/en>

²⁰ Flight test data may be sourced from ongoing and/or previous programmes, where available to support validation. Flight tests are not funded as part of this topic.

- Deliver a Regulatory Roadmap with clear Certification Methodology, validation evidence and prioritized Rule-Making Tasks (RMTs)²¹ at CRL5 with a clear pathway to CRL6 by 2030 and compatibility for the Ultra-efficient SMR and REG aircraft concepts with EIS 2035.
- Strengthen European capability in icing certification, industrial and regulatory alignment across OEMs, suppliers, and research organizations.

Scope:

The next generation of Ultra-efficient Short and Medium Range (SMR) and Regional (REG) aircraft concepts addressed in Clean Aviation are expected to integrate a set of disruptive technologies characterized by a fundamental change in the aircraft aerodynamics, propulsion, and optimized energy management. These innovations – such as high aspect ratio (HAR) laminar wings, novel airframe-engine integration and advanced systems such as electrical ice protection systems – create new icing exposure and accretion behaviours that differ from those on conventional State of the Art aircraft. Current certification methods, developed primarily for Appendix C¹⁹ icing environments and classical geometries are insufficient to demonstrate compliance under the more complex Appendix O (SLD) conditions expected for these new designs.

For the disruptive next generation aircraft concepts, it is necessary to enable a safe and efficient certification by means of new validated experimental data, advanced models and harmonized certification methodologies supporting EIS 2035. These outcomes are essential to boost the regulatory framework and enable approval of safe innovative and energy-efficient aircraft architectures under evolving icing conditions.

Applicants should demonstrate TRL4 at project start for the models – numerical, physics-based and AI-assisted and technologies, based on synergies with activities from projects such as ICE-GENESIS, SENS4ICE and EXAELIA funded by European programmes and justify complementarity with HORIZON-CL5-2026-01-D6-15 (Icing in the context of sustainable aviation).

The project scope shall include the development and validation of robust Certification Methodologies for SLD icing, focussing primarily on the Appendix O icing conditions. The project shall explicitly address both SMR and REG aircraft concepts, recognising that their exposure profiles and certification pathways are different. The project activities shall address:

- Development and update of existing numerical tools
 - o using realistic exposure scenarios derived from in-service, meteorological and climate datasets.
 - o with advanced understanding of SLD physics. Including droplet splashing, breakup, runback, erosion, altitude/speed effects, freezing drizzle and freezing rain.
 - o with integration of physics-informed AI and hybrid modelling approaches for improved accuracy and computational efficiency.
- Validation of the updated numerical tools at TRL6 against results from:
 - o Flight test data, key to achievement of TRL6, which are derived from ongoing and/or concluded projects outside the funding of this topic.
 - o Large scale Icing wind tunnel test campaigns on critical geometries from SMR and REG aircraft, generating detailed and traceable ice-shape datasets.
 - o Aerodynamic tests with artificial and natural ice shapes, quantifying lift and drag penalties.
- Delivery of Acceptable Means of Compliance for SMR and Reg aircraft certification for icing systems by
 - o conducting detailed comparison of findings above, with in-service experience

²¹ Applicants should elaborate a close cooperation with EASA on related rulemaking task planned and on-going included in the [European Plan for Aviation Safety | EASA](#) to be identified in the proposal

- defining clear, comprehensive and differentiated certification scenarios for REG and SMR aircraft, addressing specific system architectures and operating conditions.
- close engagement with EASA and other major national aviation authorities
- close cooperation with EASA on relevant RMT
- Delivery of a Certification Readiness Plan outlining maturity progression and dependencies at CRL5 with a clear pathway towards CRL6, including a segment-specific roadmap for SMR and REG certification applicability.
- Ensure active participation of European OEMs, tier-1s suppliers, test facilities, research organizations and regulators, with balanced representation from SMR and REG development programmes, to ensure cross-fertilization and alignment of certification practices.
- Deliver a documented plan of engagement with EASA, detailing roles, responsibilities and consultation points throughout the project lifecycle.

The demonstration strategy combining physical demonstrators testing and complementary modelling should be elaborated by applicants to demonstrate a TRL6 validation of the numerical tools. The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity).

With regards to certification, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path.

All deliverables related to the Acceptable Means of Compliance, Certification Methodologies and the Regulatory Roadmaps shall be made publicly available to support future European and international rule-making activities. The consortium will ensure that the results are prepared in a format suitable for regulatory uptake, enabling their use as reference inputs by EASA and other aviation authorities. Applicants are encouraged to explore opportunities to contribute to other aircraft segments subject to icing conditions such as Business Aviation.

The project shall identify and implement synergies with activities funded under research and innovation programmes at regional²², national²³ and European²⁴ level and demonstrate how the project will benefit from the specific contributions to the expected outcomes and scope.

Performance Targets:

A number of top-level goals shall be defined as basis for the performance targets:

- Produce an Acceptable Means of Compliance including test procedures, scenario definitions, validation criteria, and traceable documentation developed through close collaboration with EASA and national aviation authorities.
- Deliver an SLD Icing Regulatory Roadmap identifying certification methodology updates and relevant rule-making actions of EASA.
- Deliver a Certification Readiness plan demonstrating maturity progression towards CRL6 with a clear relevance of testing, modelling and endorsement of OEMs and regulators.
- Ensure all Acceptable Means of Compliance and certification related deliverables are published in open, regulatory-use format, providing evidence and recommendations to support the EASA rule-making activities and international standardization efforts on this matter.

The top-level goals shall be broken down in a consistent manner at the level of validation of tools.

²² activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

²³ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

²⁴ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

Pertinent performance targets including Key Performance Indicators (KPIs) shall be derived for each. In particular, the applicants shall clearly document the expected performance targets covering:

- Number of representative SLD exposure scenarios across SMR and REG flight envelopes, validated with OEM input and in-service meteorological data.
- Quantified Model to test correlation for lift and drag penalties, and uncertainty for the numerical icing prediction tools.
- Number of detailed ice shapes and number of geometry classes added to the existing validation database with documented prediction uncertainty for each.

The precise KPIs and targets, requirements, interfaces and integration should be established in close cooperation with the ACIandI (GA n. 101255025) and HERACLES (GA n. 101256949) projects. The assumptions relative to the aircraft operating envelope and flight mission profile, to the aircraft range, cruise speed, seating capacities and to the main aircraft sizing parameters in general will be provided by this project.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.²⁵ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values. They should be demonstrated by means of validation of the tools to TRL6 by 2030.

Proposals shall include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology.

A robust assessment of uncertainties and risks on achievement of performance targets for all critical technologies, sub-system and system level and their integration effects should be included in the proposal along with potential mitigation actions.

²⁵ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

HORIZON-JU-CLEAN-AVIATION-2026-04-CSA-01: Operational stakeholders' group to support the deployment of Clean Aviation aircraft concepts and technologies.

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below''	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 0.5 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 0.5 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Indicative project duration	Maximum 36 months.
Type of Action	Coordination and Support Action.
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include aircraft operators, research and technology organisations, universities, with a proven track record and extended knowledge in aircraft operations and deployment of novel technologies in the aviation ecosystem. Involvement and cooperation with key industry players from Clean Aviation projects, including aircraft and engine manufacturers should be considered as detailed in <i>Other relevant projects</i> specific condition below.</p> <p>The consortium configuration should ensure that the appropriate type of operators (such as Airlines, Airports and Ground Operators, Maintenance Repair and Overall, Air Traffic Control, referred to as "operational stakeholders" or "operators" in the rest of the topic) are represented in the project to aim at facilitating the transition from research and product innovation to market deployment from 2035.</p> <p>Applicant(s) should be able to manage and facilitate efficient and structured exchanges between a wide range of aviation stakeholders.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the market deployment of disruptive technologies. Where appropriate, the consortium should include newcomers to the programme.</p>

Membership/Consortium Agreement	The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first, second and third CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal).</p>
Project Monitoring	The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-milestones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.
Other relevant projects	<p>This project should run in close cooperation and synchronization with relevant Clean Aviation aircraft concepts projects, including:</p> <ul style="list-style-type: none"> - Ultra-Efficient Regional Aircraft: project HERACLES (GA n° 101256949). - Ultra-efficient SMR aircraft: project AClandI (GA n° 101255025) - Hydrogen Powered Aircraft: projects selected under the topic HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 <i>Aircraft concept and key technologies integration and impact assessment project</i> of this CfP. <p>Cooperation should be considered as well with the propulsion projects addressing these aircraft concepts: PHARES (GA n° 101256972), TAKE OFF (GA n° 101256962), UNIFIED (GA n° 101256789) and other relevant projects selected under this CfP.</p>

	<p>The applicants should identify the areas where cooperation with the above-mentioned projects would bring value to the proposal.</p> <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts' evaluation, and may recommend specific options to establish the cooperation with the relevant projects.</p> <p>For further information, please also consult the Rules for Submission, evaluation and selection and the dedicated part in the Amended Work Programme and Budget 2026-2027.</p>
--	--

Expected Outcome:

Project results are expected to **support the operational deployment and facilitate the adoption of the next-generation aircraft concepts and technologies addressed by the Clean Aviation programme:** Ultra-Efficient Regional aircraft (REG), Ultra-Efficient Short and Medium Range aircraft (SMR), and Hydrogen-Powered Aircraft (HPA), expected to enter into service from 2035.

The project is expected to achieve the following outcomes:

- Set-up and manage a group of operational stakeholders including airport and ground operations, airlines operations, Maintenance Repair and Overhaul (MRO) providers, Air Traffic Management (ATM), and other relevant operators, tasked to provide guidance, recommendations and requirements to the Clean Aviation Joint Undertaking's project coordinators and bodies (i.e. Technical Committee, Governing Board, Scientific Advisory Board) regarding the operational deployment of the Clean Aviation aircraft concepts and disruptive technologies. The group shall ensure a wide and diverse representation, supported by yearly workshop consultations, in order to ensure the representativeness and relevance of project conclusions.
- Analyze the operational implications of the considered aircraft concepts and technologies, identify the associated risks and gaps, and deliver recommendations:
 - from a technical standpoint, where real-life operations requirements should be considered in the technology maturation and demonstration activities undertaken by the Clean Aviation projects.;
 - from a policy and regulatory standpoint, where adaptations are deemed required for effective integration of disruptive technologies into the operational environment.
- Raise awareness and ensure engagement of operational stakeholders, to enable the aviation ecosystem to consolidate knowledge on Clean Aviation aircraft concepts and technologies, and support the preparation of their Entry Into Service (EIS) and efficient operations from 2035 onwards.

Scope:

The project activities should address the operational implications of the Clean Aviation aircraft concepts, involving innovative propulsion systems based on SAF, H2, and battery energy, combined with advanced airframe and systems technologies. To achieve its goals, the project is expected to

cooperate and align with the Clean Aviation projects responsible for the following aircraft concept definition and integration.

- The Ultra-Efficient Regional Aircraft (UERA) concept is a 50-100 passengers (pax) aircraft with a design range up to 500 Nautical Miles (NM), based on hybrid electric propulsion supplied by batteries with an EIS expected by 2035. It requires a battery recharging infrastructure and involves new electrical High-Voltage systems and batteries. The project should closely cooperate with HERACLES project (CfP 03), ensuring the coordination of Clean Aviation projects' contributions to the UERA concept. Cooperation with PHARES project (CfP 03), maturing the hybrid-electric propulsive system should be as well considered.
- The ultra efficient SMR aircraft concept is a 200-250 pax aircraft with a design range up to 3000NM, based on ducted or unducted next generation turbo-fans, with an EIS expected by 2035. It is expected to provide similar capabilities as state-of-the-art SMR aircraft and is using SAF fuel which should help compatibility with existing kerosene infrastructure. However, even small operational differences triggered by new technology could have major impact due to the wide footprint of SMR products on aviation ecosystem. The project should closely cooperate with AClandI project (CfP 03), ensuring the coordination of Clean Aviation projects' contributions to the ultra-efficient SMR aircraft concept. Cooperation with TAKE-OFF and UNIFIED projects (CfP 03), and other projects of this CfP maturing the propulsive systems should be as well considered.
- Two Hydrogen Powered Aircraft concepts are considered: an aircraft concept based on H2 Fuel-Cell propulsion technologies, with a capacity of 100 pax and range of 1000NM; and a concept based on H2 combustion in gas-turbines technologies, with a capacity of 100-150 passengers and range up to 1400NM. Both concepts have an EIS expected in the 2040s and represent a new class of aircraft with specific operational capabilities and characteristics, sitting between the regional and short-medium range market segmentation. They are expected to require more significant adaptations of the aviation ecosystem, including H2 supply at airports and refuelling procedures, adaptation of airline fleet networks, ground and maintenance procedures, or ATM integration. The project should closely cooperate with the projects to be selected from topic HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 *Aircraft concept and key technologies integration and impact assessment project* of this CfP, ensuring the coordination of HPA thrust aircraft concepts.

In order to ensure a seamless deployment in operations of future aircraft technologies, and to accelerate market adoption, the project is expected to identify major challenges and operational complexities associated to the introduction and integration of the Clean Aviation aircraft concepts and technologies in daily operations. A specific focus is expected on the identification of operational bottlenecks susceptible to delay market penetration of the new aircraft concepts. Adequate mitigation actions should be identified and operational requirements and constraints provided at technology or aircraft concept levels.

The following operational areas and topics should be considered in priority:

- **Airports and ground operators:** fuel handling, infrastructure for new energy carriers (battery charging, H2 supply), energy supply chain (such as compatibility with power peaks), Ground Support Equipment (GSE) compatibility, adaptation to aircraft geometry and weight characteristics, safety and regulation of airport and ground operations.

- **Airlines:** Route planning, maintenance scheduling, turn-around time and procedures, fleet integration including mixed fleet transition.
- **MROs:** material and component handling (in particular related to High Voltage electric systems, cryogenic H2), tooling adaptations, predictive maintenance strategies and systems, procedures and regulation associated to new energy carriers.
- **Air Traffic Control:** adaptation to different aircraft flight envelope and performance, in particular for trajectory management and separation/sequencing in congested airspaces, both in cruise and terminal areas.

This list is not exhaustive, and the applicants may propose other areas and topics relevant to support the project expected outcomes, as long as they relate to the Clean Aviation aircraft concepts.

To achieve its goals, the project is expected to set up a platform enabling on demand exchanges within the wide operational stakeholders group and with Clean aviation project contributors. The proposal should detail how these exchanges will be organized and structured, and as well type and number of operators expected to be involved or consulted. EASA and national authorities' operational bodies should have access to project events to allow fruitful exchanges of knowledge, given the importance of safety and regulations in the operational domain.

The project inputs will be based on publicly available information, which may be completed by additional confidential data or technical insights from Clean Aviation projects or operational stakeholders, in case of mutual interest and for restricted-access analysis. The applicants are expected to explain how the data management will be organized to preserve Industrial Property and commercial sensitivities of data provided from Clean Aviation projects.

The entities involved in Clean Aviation projects, yet formally not taking part in this project, should be allowed to contribute, receive and share data as part of the Clean Aviation Cooperation Agreement.

The project shall deliver a yearly report to the attention of the Clean Aviation Joint Undertaking bodies (i.e. Technical Committee, Governing Board, Scientific Advisory Board) and project coordinators, highlighting operational recommendations at programme level or at policy level to support the market deployment of the considered aircraft concepts. A public report shall be delivered at project end.

To avoid duplications and minimize overlaps, the project should leverage on outcomes from existing frameworks, projects and initiatives dealing with similar operational topics, such as from AZEA and EASA, SESAR3 JU²⁶, as well as relevant aviation projects funded under the Horizon Europe Cluster 5, or other European/national/regional initiatives. Publicly available data and results from these frameworks should be collected to inform the project and be used as starting point for more targeted analysis of Clean Aviation aircraft concepts and technologies.

The proposal should include a detailed project plan with key milestones and deliverables, together with a list of KPI and targets for project progress monitoring.

The project shall identify potential synergies with the related activities funded under research and innovation programmes at regional²⁷, national²⁸ and European²⁹ level, and demonstrate how the

²⁶ Projects selected from topic HORIZON-SESAR-2025-DES-ER-03-WA2-2: *Integration of the next generation aircraft for zero/low emission aviation*

²⁷ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

²⁸ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

²⁹ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2022-2023) and/or other EU programmes.

project will benefit from these activities.

ULTRA-EFFICIENT REGIONAL AIRCRAFT TOPICS

HORIZON-JU-CLEAN-AVIATION-2026-04-REG-01: Demonstration of advanced airframe for ultra-efficient regional aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below''	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 40 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 40 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Special eligibility condition - minimum EU contribution to SMEs, RTOs and universities	<p>A minimum of 15% of the total EU contribution shall be allocated per proposal to Small-Medium Enterprises (SMEs) ³⁰, Research and Technology Organisations (RTOs) and/or Universities having a beneficiary status.</p> <p>Proposals not meeting this condition will be declared non-eligible and will not be evaluated.</p> <p>The condition should be met by involving entities under such a legal status in the meaning of Horizon Europe rules across EU Member States and countries associated to Horizon Europe.</p>
Indicative project duration	Maximum 48 months.
Type of Action	Innovation Action.
Technology Readiness Level	<p>A minimum TRL4 shall be justified at project start for the considered technologies based on synergies with activities from Clean Aviation, Clean Sky 2, and other national, regional, and European programmes.</p> <p>Activities are expected to achieve TRL 6 at airframe level at project completion, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap (aligned with the Clean Aviation SRIA and with the objectives as defined in the Amended Work Programme and Budget 2026-2027) that can</p>

³⁰ Legal entities are advised to confirm their SME status. Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422). For more information, please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft with an entry into service by 2035.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Certification Readiness Level	<p>Activities are expected to achieve CRL 4 at project completion for critical technologies at airframe level, with a route to CRL6 at aircraft level by the end of the programme, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft with an entry into service by 2035.</p> <p>A guide to the CRL³¹ definitions and criteria to be used is available on the Funding & Tenders portal (F&T portal).</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include aircraft manufacturers, airframe and system integrators, and their supply chain with a proven track record in developing and delivering globally competitive airframe components and systems to aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development.</p> <p>The consortium configuration should ensure the appropriate industrial, economic and supply chain interests are represented in the project and can ensure the transition from research to product innovation and market deployment by 2035, and with a clearly articulated route that supports the aim of replacing 75% of the operating fleet by 2050.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and certification in the aeronautical supply chain of regional aircraft at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centers that can bring disruptive innovation to the project as proposed.</p> <p>Applicants should demonstrate in the proposal their capability to foster European competitiveness and support the development of the European industrial ecosystem, as well as to foster cooperation and a wide participation of entities across EU Member States and countries</p>

³¹ Certification Readiness Level: <https://www.easa.europa.eu/en/newsroom-and-events/news/research-innovation-updates-research-agenda-and-certification-readiness>

	associated to Horizon Europe.
Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concepts related to ultra-efficient regional aircraft.</p> <p>The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first, second and third CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal).</p>
Impact Monitoring	<p>Under the Impact Monitoring framework as defined in the Amended Work Programme and Budget 2026-2027, the participants selected in this topic shall contribute to the Ultra-Efficient Regional Aircraft Concept and to exchange all relevant information and data with UERA concept project HERACLES (GA n.° 101256949).</p> <p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact Monitoring mechanism as described in the Clean Aviation SRIA and the Amended Work Programme and Budget 2026-2027 by providing a performance assessment model of the key technologies, sub-systems or systems for possible integration on the future aircraft concept model developed in the UERA concept project HERACLES (GA n. 01255025).</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report the progress against the defined performance objectives on yearly basis by means of specific deliverables included in the project in alignment with the CAJU</p>

	<p>Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/2085³². Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.</p>
Project Monitoring	<p>The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-milestones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>
In-kind contributions (IKOP/IKAA by JU Members; co-funding by other applicants)	<p>In order to ensure the obligations for in-kind contributions by Members of the CAJU (i.e. “Founding Member”, “Associated Member” and affiliated entities to a Member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/2085¹⁴, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. “Founding Member”, “Associated Member” and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to operation activities and in-kind contribution to additional activities) should be no less than 1.5³³ times the funding request in aggregate for the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/2085³⁴, only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a “Member” of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the project and to the programme/Strategic Research and Innovation Agenda³⁵ at large.</p>

³² Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

³³ In order to support a leverage factor of no less than the ratio between the contribution from members other than the Union (EUR 2 400 000 000) and the Union financial contribution (EUR 1 700 000 000), which are defined in the Council Regulation (EU) 2021/2085

³⁴ Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014

³⁵ <https://clean-aviation.eu/sites/default/files/2024-09/2024-Clean-Aviation-SRIA.pdf>

Other relevant projects	<p>This project should run in close cooperation and synchronization with relevant Clean Aviation projects, including UERA concept project HERACLES (GA n° 101256949), and those that will be selected under this CfP, including the project selected from the topic HORIZON-JU-CLEAN-AVIATION-2026-04-TRA-01 Demonstration and Validation of icing Certification Methodologies compatible with EIS2035 for the SMR and REG Aircraft.</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027, and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first, second and third CAJU CfP; - draw up in their proposal a list of projects selected under the first, second and third call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal's objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6. <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts' evaluation.</p> <p>For further information, please also consult the Rules for Submission, evaluation and selection and the dedicated part in the Amended Work Programme and Budget 2026-2027.</p>
Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p> <p>Applicants are requested to establish contacts with the ultra-efficient regional aircraft concept owner³⁶ (i.e. consortium leaders of project</p>

³⁶ The owner of Clean Aviation aircraft concepts are the project coordinators of projects AClandI (GA n. 101255025) HERACLES (GA n.101256949), and the one defined in the topic conditions of HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01: "Aircraft concept and key technologies integration and impact assessment", which is launched as part of this CfP. Please also refer to the Clean Aviation integrated roadmaps published in the CAJU Amended Work Programme 2026-2027.

	<p>HERACLES (GA n° 101256949) in view of defining a detailed description of the project technical activities for route to certification.</p> <p>Applicants are requested to establish contact with EASA in view of defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal with an estimate of the budget to cover EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of the call.</p>
--	---

Expected Outcome:

Project results are expected to demonstrate an advanced airframe for the Ultra-Efficient Regional Aircraft (UERA) concept considered by Clean Aviation SRIA for Entry Into Service (EIS) by 2035:

- Addressing the wing, fuselage, empennage, and key enabling system technologies for airframe optimisation (as detailed in the *scope* section below).
- TRL6 shall be achieved for the integrated airframe concept, based on Ground Test Demonstrations (GTD) including all necessary testing to support technology readiness for an aircraft EIS by 2035.

- Defining and delivering airframe design models to the HERACLES (GA n° 101256949) project for aircraft level integration with the hybrid-electric propulsive systems, and performance assessment of the UERA concept of Clean Aviation by end of 2030.
- The advanced airframe shall be compliant to CS-25 certification requirements, achieving a Certification Readiness Level 4 (CRL4) for critical technologies based on the project GTD, and identify a route to CRL6 at aircraft level by the end of CA programme.

The project results are expected to directly contribute to the performance targets of the UERA concept:

- The advanced airframe shall enable at least 10% CO2 emissions reduction, contributing to the overall objective of 30% CO2 emissions reduction at aircraft level, compared to 2020 State-of-the-Art aircraft available in service.
- 100% SAF compatibility shall be achieved, enabling 86% net CO2 reduction when combined with the 30% CO2 emissions reduction at aircraft level.
- The evaluation, monitoring and reporting of key parameters needed to assess noise emissions (including aerodynamic airframe noise contribution), shall ensure compliance with foreseen regulations and standards for a 2035 EIS.
- Adequate KPIs at integrated airframe & key technologies levels shall be defined to support the effective achievement of the expected outcomes and shall be aligned with the *performance targets* defined in the section below.

A clear route towards certification, exploitation, and industrialization shall be identified, including the identification of operational requirements to support successful entry into service.

Scope:

The configuration of the Ultra-Efficient Regional Aircraft (UERA) concept proposed in Clean Aviation is expected to remain tube and wing and should target an Entry into Service (EIS) from 2035. Such an aircraft concept should have a capacity of around 50-100 passengers (pax) with a design range up to 500 Nautical Miles (NM), operated on a typical mission of 250NM.

This new generation aircraft concept is based on several advanced design features that affect most of the critical systems and major components, plus an innovative wing-mounted powerplant with hybrid-electric capability based on batteries.

The present topic aims to develop and demonstrate the advanced airframe supporting this UERA concept. The airframe is a key contributor to the aircraft performance objectives, complementing the performance improvements expected from the hybrid-electric propulsion system. The integration constraints of hybrid-electric propulsive technologies (powerplant & nacelle, batteries, electrical, thermal and energy management systems) shall be considered as part of the cooperation with other Clean Aviation projects, to ensure the compatibility of the airframe architecture and technologies with the overall UERA concept.

The project scope shall include the design, development and demonstration of:

- The **overall airframe architecture**, including multi-disciplinary optimisation (e.g. structural, aerodynamics and systems interactions, dependency of empennage and wing sizing, consideration of acoustic effects) in all flight phases, to achieve the *performance targets* as

detailed in next section, and compatible with a parallel-hybrid propulsive architecture with two wing-mounted engines and based on battery electrical storage.

- A **high-aspect ratio wing**, based on lightweight structures and advanced aerodynamics, compatible with 100% SAF storage, integrating advanced systems contributing the overall airframe optimisation (e.g. aerodynamics, loads control, low energy consumption), and compatible with a wing-mounted hybrid-electric powerplant.
- An **empennage** based on lightweight structures, advanced aerodynamics, and system technologies enabling its optimisation.
- A **fuselage** based on lightweight structures and optimized aerodynamics shapes (e.g. cockpit, fairings), compatible with the installation of systems enabling the hybrid-electric propulsion and integrating lightweight acoustic treatment to favour passenger acceptance.
- **The key enabling systems and equipment needed for airframe optimisation:**
 - A Flight Control Systems architecture enabling an optimal high aspect-ratio wing and ensuring aircraft manoeuvrability and controllability.
 - An optimized high lift-system integrated to the wing, to ensure the low-speed performance of the hybrid-electric aircraft.
 - An Ice Protection System (IPS) for the wing and empennage, targeting compliance with CS-25 icing certification requirements for a 2035 EIS (hence aiming at addressing Supercooled Large Droplets conditions, in cooperation with the dedicated transverse topic³⁷), and contributing to aerodynamics, weight, and energy management optimisation.
 - Other relevant systems with a significant impact on airframe aerodynamic and weight improvements (to be duly justified by the applicants).
 - The project should address the integration and performance effects of these systems on the airframe and the other aircraft systems (e.g. non-propulsive energy).

The airframe structures should consider advanced materials and manufacturing processes, to ensure the weight reduction objectives, industrial readiness (e.g. production rates, quality control, energy and waste), and in-service operations readiness (e.g. maintenance and reparability, passenger comfort, end-of-life). These novel technologies are expected to enable higher structural integration, optimized systems integration within structural components, and topology optimisation, contributing to the overall airframe optimisation.

The demonstration activities shall cover adequate ground demonstrations at airframe level, wing, fuselage, empennage, system level, sub-components and sub-systems level, and technology brick level, done at full scale and in representative environment conditions of the UERA concept, **to TRL6 level**.

These demonstrations shall validate the technologies and their design integration at airframe level, ensuring the adequate integration and combination of the different elements that were matured in isolation. The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity), and emphasize how they address the integration aspects.

These demonstrations should include a set testing and modelling activities, such as:

³⁷ HORIZON-JU-CLEAN-AVIATION-2026-04-TRA-01 Demonstration and Validation of icing Certification Methodologies compatible with EIS2035 for the SMR and REG Aircraft, part of this CfP.

- Wind Tunnel Testing (WTT) in various aircraft operating conditions (e.g. high speed, low speed), as needed to demonstrate the aerodynamic integration and performance of the airframe.
- Structural testing for relevant components and sub-components, at full scale and with the relevant load cases and interfaces representative of the UERA concept.
- System functional and physical integration testing at system and sub-system level, with representative scale, interfaces (e.g. hinge moments for flight control system), and conditions of the UERA concept.
- Acoustic testing and/or modelling for lightweight cabin acoustic treatments and airframe aerodynamic noise assessment.
- Completed by modelling analysis such as full 3D digital mock-up, Computational Flight Dynamics (CFD) and Finite Element Models (FEM), aeroelastic models, and system simulations, as needed to demonstrate relevant design features and the global airframe integration and performance.

The demonstration strategy combining physical demonstrators testing and complementary modelling should be elaborated by applicants to justify the TRL6 achievement at integrated airframe level, compatible with an EIS by 2035.

With regards to **certification**, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path.

It is expected that the activities identify the main principles for technical standards and overall necessary rulemaking for the UERA concept, to achieve CRL4 at airframe level, and identify a roadmap to support a CRL6 at aircraft level by end of 2030.

The applicants shall perform a preliminary risk assessment of possible impact of proposed solutions on existing Type Certificate, for a modified turbo-prop aircraft family. Risk mitigation measures will be identified regarding certifiability and quantification of expected impact on the performance metrics.

The project is required to exploit the involvement and expertise of EASA in the proposal to de-risk and secure the certification of novel airframe technologies with the aim to assess and define how the envisaged solutions will have the potential for certification (ref. to topic conditions related to “Involvement of EASA”).

With the aim to define the route to “exploitation”, operational assessment should be done to support the successful deployment and continuous operation of future UERA, including ground operations, repairability and maintainability.

The project shall identify and implement synergies with activities funded under research and innovation programmes at regional³⁸, national³⁹ and European⁴⁰ level, and demonstrate how the project will benefit from these activities by detailing the specific contributions to the expected outcomes.

³⁸ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

³⁹ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

⁴⁰ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

Performance Targets:

A number of **top-level goals for the Ultra-Efficient Regional Aircraft (UERA) concept** will be the basis for performance targets, in particular:

- Contribute to **30% CO2 emission reduction for the UERA concept**, compared to 2020 state-of-the-art aircraft available in service.
- To achieve this:
 - o a **10% or greater CO2 emission reduction (without SAF) is expected for the advanced airframe**, when integrated at aircraft level with the hybrid-electric propulsive system. This number accounts for weight and aerodynamic performance of the airframe, including the integration of the enabling systems and cabin acoustic treatments.
 - o **100% drop-in SAF compatibility** shall be ensured for the fuel storage.
- **Noise emissions levels driven by the airframe shall support the aircraft-level** full compliance with ICAO noise standard (chapter 14 noise limits), with adequate certification cumulative noise level margin, while considering future updates to the noise standard in view of a 2035 EIS.

The top-level goals shall be broken down in a consistent manner at the different levels: from top-level aircraft requirements to airframe level, fuselage, wing, empennage and enabling-systems level requirements. Pertinent performance targets including Key Performance Indicators (KPIs) shall be derived at each level, including relevant weight, aerodynamics and system energy consumption targets.

In particular, the applicants shall clearly document the expected **performance targets** for:

- Wing aerodynamics and weight improvements, which are expected to be the main contributor of airframe performance gains on the UERA concept featuring a high aspect ratio wing enabled by advanced flight controls.
- Fuselage aerodynamics and weight improvements.
- Empennage aerodynamics and weight improvements.
- Enabling systems (Flight Controls, High-Lift, Ice Protection, and other relevant systems) performance contributions or penalties, including power consumption and integration effects.

The requirements, interfaces and integration constraints (e.g. for hybrid-electric propulsion and associated systems) of the advanced airframe should be established at project start in close cooperation with the HERACLES project, ensuring the coordination of all projects contributing the UERA concept. This project will define the assumptions relative to the aircraft operating envelope and flight mission profile, to the aircraft range, cruise speed, seating capacities and to the main aircraft sizing parameters in general. It will provide the initial preliminary aircraft concept and technology requirements, as starting point of the advanced airframe design and demonstration activities. It will also support the performance assessment of the advanced airframe design when integrated at aircraft level with the hybrid-electric propulsive system.

The exchanges and delivery of models and data should be adequately planned to support the performance, emissions and life-cycle assessment of the UERA concept targeted for EIS in 2035. The models shall be compatible with the UERA aircraft digital framework and requirements and shall be continuously validated and updated at each step in the TRL progress loop.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.⁴¹ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposals shall include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology.

A robust assessment of uncertainties and risks on achievement of performance targets for all critical technologies, sub-system and system level and their integration effects should be included in the proposal along with potential mitigation actions.

⁴¹ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

SHORT AND MEDIUM-RANGE AIRCRAFT TOPICS

HORIZON-JU-CLEAN-AVIATION-2026-04-SMR-01 Demonstration of an Optimized Systems Platform for Ultra-efficient SMR Aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below''	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 30 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 30 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Special eligibility condition - minimum EU contribution to SMEs, RTOs and universities	<p>A minimum of 15% of the total EU contribution shall be allocated per proposal to Small-Medium Enterprises (SMEs) ⁴², Research and Technology Organisations (RTOs) and/or Universities having a beneficiary status.</p> <p>Proposals not meeting this condition will be declared non-eligible and will not be evaluated.</p> <p>The condition should be met by involving entities under such a legal status in the meaning of Horizon Europe rules across EU Member States and countries associated to Horizon Europe.</p>
Indicative project duration	Maximum 36 months.
Type of Action	Innovation Action.
Technology Readiness Level	<p>A minimum TRL4 shall be justified at project start for the considered technologies based on synergies with activities from Clean Aviation and other national, regional, and European programmes.</p> <p>Activities are expected to achieve TRL 6 at Optimized System Platform level at project completion, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap (aligned with the Clean Aviation SRIA and with the objectives as defined in the Amended Work Programme and Budget 2026-2027) that can deliver the technology maturity needed by the end of Clean Aviation for</p>

⁴² Legal entities are advised to confirm their SME status. Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422). For more information, please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>the results of their project to be included in new aircraft with an entry into service by 2035.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Certification Readiness Level	<p>Activities are expected to achieve CRL4 for the critical technologies of the Optimized System Platform at project completion, with a route to CRL6 at aircraft level by the end of the programme, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft with an entry into service by 2035.</p> <p>A guide to the CRL⁴³ definitions and criteria to be used is available on the Funding & Tenders portal</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include aircraft manufacturers, and system integrators, and their supply chain with a proven track record in developing and delivering globally competitive systems to aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development.</p> <p>The consortium configuration should ensure the appropriate industrial, economic and supply chain interests are represented in the project and can ensure the transition from research to product innovation and market deployment by 2035, and with a clearly articulated route that supports the aim of replacing 75% of the operating fleet by 2050.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and certification in the aeronautical supply chain of short-medium range aircraft at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centers that can bring disruptive innovation to the project as proposed.</p> <p>Applicants should demonstrate in the proposal their capability to foster European competitiveness and support the development of the European industrial ecosystem, as well as to foster cooperation and a wide participation of entities across EU Member States and countries</p>

⁴³ Certification Readiness Level: <https://www.easa.europa.eu/en/newsroom-and-events/news/research-innovation-updates-research-agenda-and-certification-readiness>

	associated to Horizon Europe.
Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concepts related to short-medium range aircraft.</p> <p>The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first, second and third CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal).</p>
Impact Monitoring	<p>Under the Impact Monitoring framework as defined in the Amended Work Programme and Budget 2026-2027, the participants selected in this topic shall contribute to the SMR Aircraft Concept and to exchange all relevant information and data with short-medium range aircraft concept project AClandI (GA n. 101255025).</p> <p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact Monitoring mechanism as described in the Clean Aviation SRIA and the Amended Work Programme and Budget 2026-2027 by providing a performance assessment model of the key technologies, sub-systems or systems for possible integration on the future aircraft concept model developed in the short-medium range aircraft concept project to be selected as part of AClandI (GA n. 101255025) project.</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report the progress against the defined performance objectives on a yearly basis by means of specific deliverables included in the project in alignment with the CAJU</p>

	<p>Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/2085⁴⁴. Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.</p>
Project Monitoring	<p>The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-millstones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>
In-kind contributions (IKOP/IKAA by JU Members; co-funding by other applicants)	<p>In order to ensure the obligations for in-kind contributions by Members of the CAJU (i.e. “Founding Member”, “Associated Member” and affiliated entities to a Member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/2085⁴⁴, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. “Founding Member”, “Associated Member” and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to operation activities and in-kind contribution to additional activities) should be no less than 1.5⁴⁵ times the funding request in aggregate for the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/2085⁴⁶, only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a “Member” of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the project and to the programme/Strategic Research and Innovation Agenda⁴⁷ at large.</p>

⁴⁴ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

⁴⁵ In order to support a leverage factor of no less than the ratio between the contribution from members other than the Union (EUR 2 400 000 000) and the Union financial contribution (EUR 1 700 000 000), which are defined in the Council Regulation (EU) 2021/2085

⁴⁶ Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014

⁴⁷ <https://clean-aviation.eu/sites/default/files/2024-09/2024-Clean-Aviation-SRIA.pdf>

Other relevant projects	<p>This project should run in close cooperation and synchronization with relevant Clean Aviation project AClandI (GA n. 101255025) and those that will be selected under this CfP.</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027, and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first, second and third CAJU CfP; - draw up in their proposal a list of projects selected under the first, second and third call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal's objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6. <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts' evaluation.</p> <p>For further information, please also consult the Rules for Submission, evaluation and selection and the dedicated part in the Amended Work Programme and Budget 2026-2027.</p>
Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p> <p>Applicants are requested to establish contacts with the short-medium range and regional aircraft concept owner⁴⁸ (i.e. consortium leaders of project AClandI (GA n. 101255025)) in view of defining a detailed description of the project technical activities for route to certification. The route to certification should be focused on the certification aspects considered crucial for de-risking the exploitation route.</p>

⁴⁸ The owner of Clean Aviation aircraft concepts are the project coordinators defined in the topic conditions of HORIZON-JU-CLEAN-AVIATION-2025-03-ACI-01: "Aircraft concept and key technologies integration and impact assessment", which is launched as part of this CfP. Please also refer to the Clean Aviation integrated roadmaps published in the CAJU Amended Work Programme 2026-2027.

	<p>Applicants are requested to establish contact with EASA in view of defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal with an estimate of the budget to cover EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of the call.</p>
--	--

Expected Outcome:

Project results are expected to demonstrate a safe and certifiable advanced systems platform required to enable disruptive functions such as active control, hybridisation, advanced automation and predictive maintenance to enable the next generation Ultra-efficient Short and Medium Range (SMR) aircraft concept. The future aircraft will rely on a highly integrated optimised systems platform requiring high-performance computing, communication and energy systems enabling real-time, safe and secure interconnectivity across all aircraft systems.

Projects are expected to achieve the following outcomes:

- Deliver a validated optimized systems platform demonstrator at TRL 6 through representative integration and validation in a relevant environment, targeting a reduced system footprint optimizing for weight, volume and energy consumption.
- Demonstrate an integrated computing backbone hosting all major SMR aircraft functions, including time-critical and safety-critical applications.

- Deliver a validated on-ground demonstrator, substantiating full-system performance in processing power, latency, safety and cybersecurity.
- Demonstrate compliance of the systems platform to CS-25 certification requirements, achieving a Certification Readiness Level 4 (CRL4) for critical technologies based on the project GTD, and identify a route to CRL6 at aircraft level by the end of CA programme.
- Demonstrate the expected industrial and operational benefits of the integrated and optimized system platform, as well as the related increase in efficiency in terms of installation time on the aircraft.

The project results are expected to directly contribute to the performance targets of the ultra-efficient SMR aircraft concept with EIS by 2035.

A clear route towards certification, exploitation, and industrialization shall be identified, including the identification of operational requirements to support successful entry into service.

Scope:

The Ultra-efficient Short and Medium Range (SMR) aircraft concept targeted in Clean Aviation are expected to integrate a set of disruptive technologies characterized by a fundamental change in the requirements for system platforms. Innovations such as active control of high aspect ratio (HAR) wings, hybridisation and predictive maintenance – create a level of complexity which conventional system architectures cannot sustain. Future SMR aircraft are expected to require higher than thirty times more computing power, five times more electrical power and two orders of magnitude higher data throughput as compared to the last generation of large passenger aircraft in service.

To support an Entry into Service by 2035 of the Ultra-efficient SMR aircraft concepts, optimized system platforms are required to integrate robust digital and electrical capabilities enabling functional density, data sharing, and operational efficiency, guaranteeing safety, cybersecurity and maintainability. It will aim to reduce system complexity, standardise interfaces and enable faster and more reliable industrialisation.

The project scope should include the design, development and validation of an Optimized System Platform for an Ultra-Efficient SMR aircraft to demonstrate its functional coverage, computing performance, system reliability and resilience, reduced system footprint and energy efficiency at TRL 6 on ground. The project activities shall address:

- Selection and definition of a set of functions that will represent a future SMR platform usage in terms of computing resources, time critical aspects, safety critical, data and connectivity needs.
- Development of a systems architecture using a holistic approach optimised for SMR aircraft functions enabling integration of above aircraft functions across multiple ATA domains, and reduced weight, volume and energy consumption.
- Validation of the systems platform architecture for system integration process and tools, platform performance compliance with the functional needs for all selected functions against targeted performance objectives as detailed in the performance targets section below.
- Contribution to SMR platform competitiveness because of reduced part count, optimization of aircraft customization, reduced installation time and maintenance.
- Conduct and document a comprehensive system reliability and safety analysis to assess system behaviour under failure and degraded conditions, in accordance with applicable certification standards.

The demonstration activities shall include:

- Virtual integration and hardware-in-the-loop simulations.

- Physical testing on an integrated ground demonstrator representing relevant operational environment of SMR aircraft systems.
- End-to-end functionality validation for normal and abnormal operations
- Integration of time-critical, high-bandwidth and AI-assisted applications under realistic data loads.

The demonstration strategy combining physical demonstrators testing and complementary modelling should be elaborated by applicants to demonstrate a TRL6 achievement at integrated systems platform level, compatible with an EIS 2035. The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity) and emphasize how they address the integration aspects.

With regards to certification, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path. It is expected that the key technologies will achieve CRL4 by project end and identify the route to CRL6 at aircraft level by end of the programme.

The project is required to exploit the involvement and expertise of EASA in the proposal to de-risk and secure the certification of proposed technologies with the aim to assess and define how the envisaged solutions will have the potential for certification (ref. topic conditions related to “Involvement of EASA”).

The project shall identify and implement synergies with activities funded under research and innovation programmes at regional⁴⁹, national⁵⁰ and European⁵¹ level and demonstrate how the project will benefit from the specific contributions to the expected outcomes and scope.

Performance Targets:

A number of top-level goals for the Ultra-Efficient SMR Aircraft concept shall be defined by the applicants and will be the basis for performance targets as compared to an identified and justified State of the Art system platform in the last generation of large passenger aircraft in service, in particular:

- Demonstrate at least a thirty-fold increase in computing power as compared to the state of the art 2020.
- Demonstrate at least 2 orders of magnitude higher data throughput and network bandwidth with reduced latency, compliant with the next-generation deterministic networking standards.
- Demonstrate the performance benefit improvements (weight, volume, architecture).
- Demonstrate the capability to host the full range of SMR aircraft system functions.
- Demonstrate the enhanced competitiveness of the future SMR system platform in terms of industrial savings benefiting from reduced integration lead time

The top-level goals shall be broken down in a consistent manner at the level of system platform components and architecture. Pertinent performance targets including Key Performance Indicators (KPIs) shall be derived for each, identifying and specifying the State-of-the-Art systems platform for comparison against the targets.

The precise KPIs and targets, requirements, interfaces and integration of the advanced airframe should be established in close cooperation with the ACIandI (GA n. 101255025) project. The assumptions relative to the aircraft operating envelope and flight mission profile, to the aircraft

⁴⁹ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

⁵⁰ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

⁵¹ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027 and/or other EU programmes.

range, cruise speed, seating capacities and to the main aircraft sizing parameters in general will be provided by this project.

The exchanges and delivery of models and data should be adequately planned to support the performance, emissions and life-cycle assessment of the Ultra-Efficient SMR aircraft concepts targeted for EIS in 2035.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.⁵² objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposals shall include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology.

A robust assessment of uncertainties and risks on achievement of performance targets for all critical technologies, sub-system and system level and their integration effects should be included in the proposal along with potential mitigation actions.

⁵² S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

HORIZON-JU-CLEAN-AVIATION-2026-04-SMR-02 Demonstration of an Ultra-Efficient Rear Fuselage and Empennage and Its Integrated Industrial System enabling EIS2035 for the SMR Aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below”	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 40 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 40 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Special eligibility condition - minimum EU contribution to SMEs, RTOs and universities	<p>A minimum of 15% of the total EU contribution shall be allocated per proposal to Small-Medium Enterprises (SMEs) ⁵³, Research and Technology Organisations (RTOs) and/or Universities having a beneficiary status.</p> <p>Proposals not meeting this condition will be declared non-eligible and will not be evaluated.</p> <p>The condition should be met by involving entities under such a legal status in the meaning of Horizon Europe rules across EU Member States and countries associated to Horizon Europe.</p>
Indicative project duration	Maximum 48 months.
Type of Action	Innovation Action.
Technology Readiness Level	<p>A minimum TRL4 shall be justified at project start for the considered technologies based on synergies with activities from Clean Aviation, Clean Sky 2, and other national, regional, and European programmes.</p> <p>Activities are expected to achieve TRL 6 at Major Component Assembly level and Industrial System level at project completion, as indicated in section ‘Expected Outcome’.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap (aligned with the Clean Aviation SRIA and with the objectives as defined in the Amended Work Programme and Budget 2026-2027) that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft with an entry</p>

⁵³ Legal entities are advised to confirm their SME status. Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422). For more information, please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>into service by 2035.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Certification Readiness Level	<p>Activities are expected to achieve CRL4 for critical technologies at Major Component Assembly and Industrial System at project completion, with a route to CRL6 at aircraft level by the end of the programme, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft with an entry into service by 2035.</p> <p>A guide to the CRL⁵⁴ definitions and criteria to be used is available on the Funding & Tenders portal (F&T portal).</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include aircraft manufacturers, airframe and system integrators, and their supply chain with a proven track record in developing and delivering globally competitive systems to aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development.</p> <p>The consortium configuration should ensure the appropriate industrial, economic and supply chain interests are represented in the project and can ensure the transition from research to product innovation and market deployment by 2035, and with a clearly articulated route that supports the aim of replacing 75% of the operating fleet by 2050.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and certification in the aeronautical supply chain of short-medium range aircraft at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centers that can bring disruptive innovation to the project as proposed.</p> <p>Applicants should demonstrate in the proposal their capability to foster European competitiveness and support the development of the European industrial ecosystem, as well as to foster cooperation and a wide participation of entities across EU Member States and countries</p>

⁵⁴ Certification Readiness Level: <https://www.easa.europa.eu/en/newsroom-and-events/news/research-innovation-updates-research-agenda-and-certification-readiness>

	associated to Horizon Europe.
Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concepts related to short-medium range aircraft.</p> <p>The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first, second and third CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal).</p>
Impact Monitoring	<p>Under the Impact Monitoring framework as defined in the Amended Work Programme and Budget 2026-2027, the participants selected in this topic shall contribute to the SMR Aircraft Concept and to exchange all relevant information and data with short-medium range aircraft concept project AClandI (GA n. 01255025).</p> <p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact Monitoring mechanism as described in the Clean Aviation SRIA and the Amended Work Programme and Budget 2026-2027 by providing a performance assessment model of the key technologies, sub-systems or systems for possible integration on the future aircraft concept model developed in the short-medium range aircraft concept project to be selected as part of AClandI (GA n. 01255025) project.</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report the progress against the defined performance objectives on a yearly basis by means of specific deliverables included in the project in alignment with the CAJU</p>

	<p>Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/2085⁵⁵. Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.</p>
Project Monitoring	<p>The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-milestones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>
In-kind contributions (IKOP/IKAA by JU Members; co-funding by other applicants)	<p>In order to ensure the obligations for in-kind contributions by Members of the CAJU (i.e. “Founding Member”, “Associated Member” and affiliated entities to a Member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/2085¹⁴, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. “Founding Member”, “Associated Member” and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to operation activities and in-kind contribution to additional activities) should be no less than 1.5⁵⁶ times the funding request in aggregate for the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/2085⁵⁷, only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a “Member” of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the project and to the programme/Strategic Research and Innovation Agenda⁵⁸ at large.</p>

⁵⁵ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

⁵⁶ In order to support a leverage factor of no less than the ratio between the contribution from members other than the Union (EUR 2 400 000 000) and the Union financial contribution (EUR 1 700 000 000), which are defined in the Council Regulation (EU) 2021/2085

⁵⁷ Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014

⁵⁸ <https://clean-aviation.eu/sites/default/files/2024-09/2024-Clean-Aviation-SRIA.pdf>

Other relevant projects	<p>This project should run in close cooperation and synchronization with relevant Clean Aviation projects AClandI (GA n. 101255025) and LEIA (GA n. 101255065) and those that will be selected under this CfP.</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027, and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first, second and third CAJU CfP; - draw up in their proposal a list of projects selected under the first, second and third call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal's objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6. <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts' evaluation.</p> <p>For further information, please also consult the Rules for Submission, evaluation and selection and the dedicated part in the Amended Work Programme and Budget 2026-2027.</p>
Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p> <p>Applicants are requested to establish contacts with the short-medium range aircraft concept owner⁵⁹ (i.e. consortium leaders of project AClandI (GA n. 101255025)) in view of defining a detailed description of the project technical activities for route to certification.</p> <p>Applicants are requested to establish contact with EASA in view of</p>

⁵⁹ The owners of Clean Aviation aircraft concepts are the project coordinators of projects AClandI and HERACLES and the ones defined in the topic conditions of HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01: "Aircraft concept and key technologies integration and impact assessment", which is launched as part of this CfP. Please also refer to the Clean Aviation integrated roadmaps published in the CAJU Amended Work Programme 2026-2027.

	<p>defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal with an estimate of the budget to cover EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of the call.</p>
--	---

Expected Outcome:

Project results are expected to demonstrate an advanced lightweight and aerodynamic ultra-efficient rear fuselage and empennage (RFE), and industrial system technologies that enable sustainable and high-rate production for the Ultra-Efficient Short and Medium Range (SMR) aircraft concept considered by the Clean Aviation SRIA for Entry into Service (EIS) by 2035.

The project is expected to achieve the following outcomes, and shall demonstrate the industrial system performance in line with high production-rate target of at least 100 units per month:

- Deliver an aerodynamically efficient, lightweight and high-rate manufacturable ultra-efficient RFE concept at TRL6, addressing the requirements of the Clean Aviation Ultra-Efficient SMR Aircraft concept as outlined in the project AClandI (GA n. 101255025).
- Achieve TRL6 for a full-scale Major Component Assembly (MCA) of the RFE, demonstrated by means of Ground Test Demonstrations (GTDs).

- Demonstrate an Industrial System ready for EIS 2035, achieving TRL6 for the associated manufacturing and assembly processes, demonstrating production-representative maturity for a full-scale RFE.
- Achieve a Certification Readiness Level 4 (CRL4) for critical technologies based on the GTDs and identify a route to CRL6 at aircraft level by end of the Clean Aviation programme, ensuring compliance of the MCA of the RFE to CS-25 certification requirements.

The project results are expected to directly contribute to the achievement of performance targets and to ensure the industrial readiness required to support the launch of disruptive new products for the Ultra-efficient SMR aircraft concept with EIS by 2035:

- The RFE shall enable and contribute to a 2% CO₂ emissions reduction at aircraft level compared to the 2020 State of the Art aircraft available in service.
- The industrial system shall demonstrate readiness to support a high manufacturing rate of at least 100 units per month as opposed to the current rate of production.
- Adequate KPIs at integrated airframe and key technology levels shall be defined to support the effective achievement of the expected outcomes and shall be aligned with the performance targets section below.

A clear route towards exploitation of the key technologies, airframe assembly and industrial systems shall be identified, including the identification of operational requirements to support successful entry into service.

Scope:

The configuration of the Ultra-efficient SMR aircraft concept proposed in Clean Aviation is expected to maintain a tube and wing and target Entry into Service (EIS) by 2035. Such an aircraft concept should have a capacity of around 200-250 pax with a design range up to 3000NM, operated on a typical mission of 800NM at cruise speed Ma 0.78.

To meet the future demand and enable the EIS by 2035 of the Ultra-Efficient SMR aircraft, the production rate needs to increase significantly, reaching around 100 units per month. However, the aircraft manufacturing ecosystem remains constrained by the effects of the pandemic, including supply chain disruptions, labour shortages, and limited availability of critical component, leading to backlogs and delayed fleet renewal. These industrialization challenges need to be addressed now, to accelerate aircraft production rates and support the future modernization of the global fleet with the Ultra-Efficient SMR. This is also critical to strengthening of the European aviation competitiveness.

The project aims to validate a co-development approach towards design, manufacturing, assembly and quality control processes that are suitable for high-rate, sustainable aircraft production to TRL6 and a specific focus on industrial readiness and manufacturing. The project should demonstrate that the RFE is designed on a coherent set of requirements for the Clean Aviation Ultra-efficient SMR aircraft concept from the ACIandI (GA n. 101255025) project. The RFE will maximize the CO₂ emissions reduction contribution at aircraft level by integrating technologies that focus on both weight and drag reduction matured and demonstrated at TRL6, coupled with advanced manufacturing techniques matured and demonstrated at TRL6.

Applicants should demonstrate the design, optimization, manufacturing and testing of a full-scale RFE demonstrator to validate the structural integrity of the product and its corresponding industrial system maturity for process capability, maintainability and reparability. The demonstrations shall address the following to TRL6 level:

- Advanced multifunctional structures produced with high-performance composite or hybrid materials, with anti-icing capabilities.

- Improved aerodynamic efficiency with Natural Laminar Flow design including validated surface requirements for manufacturing of the component.
- Improved handling quality at low speed for icing conditions of leading-edge extension
- Validation of aeroelastic models against dynamic wind tunnel and flight-testing results for flutter characterization and impact of novel structures and laminar flow
- High-rate and automated composite manufacturing processes to reduce waste and improve accuracy, including joining methods, automated and flexible assembly systems, robotics, digitalization and quality control using Artificial Intelligence and advanced Non-Destructive Testing.
- Validated digital twin and digital factory concepts for integration of design and manufacturing, logistics optimization and process traceability.
- Compliance to existing and validated eco-design methodology and to future regulations on waste and resource reduction and non-hazardous material substitution.
- In-service reparability and maintainability as part of the co-design approach, to ensure the route to exploitation.

All key technologies proposed for inclusion in the RFE shall demonstrate a clear exploitation potential, supported by evidence of industrial relevance and maturity, and shall be justified through a structured prioritization process.

The demonstration activities shall include:

- Wind Tunnel Testing (WTT) in various aircraft operating conditions (high speed, low speed) to demonstrate the aerodynamic integration and performance of the airframe.
- Structural testing for relevant components and sub-components, at full scale and with the relevant load cases and interfaces representative of the Ultra-Efficient SMR Aircraft concept.
- System functional and physical integration testing at system and sub-system level, with representative scale, interfaces, and conditions of the Ultra-Efficient SMR Aircraft concept.
- Completed by relevant digital modelling analysis and system simulations, as needed to demonstrate relevant design features and the global airframe integration and performance.

The demonstration strategy combining physical demonstrators testing and complementary modelling should be elaborated by applicants to demonstrate a TRL6 achievement at integrated airframe level, compatibly with an EIS 2035 of the integrated airframe with technology maturity needed in 2030. The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity) and emphasize how they address the integration aspects.

With regards to certification, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path. It is expected that the key airframe technologies and industrial system technologies will achieve CRL4 by 2030 and identify a roadmap to support a CRL6 at aircraft level by programme end.

The project is required to exploit the involvement and expertise of EASA in the proposal to de-risk and secure the certification of novel airframe technologies with the aim to assess and define how the envisaged solutions will have the potential for certification (ref. topic conditions related to “Involvement of EASA”). Relevant Means of Compliance and design allowable for novel materials, joints and processes must be jointly agreed with the regulatory authorities.

The project shall identify and implement synergies with activities funded under research and

innovation programmes at regional⁶⁰, national⁶¹ and European⁶² level and demonstrate how the project will benefit from the specific contributions to the expected outcomes.

Performance Targets:

A number of top-level goals for the Ultra-Efficient SMR Aircraft concept will be the basis for performance targets, in particular:

- Contribute to 30% CO2 emission reduction for the ultra-efficient SMR aircraft concept compared to 2020 state-of-the-art aircraft available in service.
- Demonstrate a reduction of at least 2% in aircraft level CO2 emissions reduction as a result of the innovations proposed in the RFE excluding SAF effects.
- Demonstrate a weight reduction of at least 20% at the full-scale RFE assembly level compared to the State-of-the-Art metallic structures.
- Demonstrate an industrial system compatible with high-rate manufacturing, enabling sustained production in line with expected increase to 100 aircraft per month and significantly reduced production lead times.

The top-level goals shall be broken down in a consistent manner at the level of airframe technologies and industrial system technologies. Pertinent performance targets including Key Performance Indicators (KPIs) shall be derived for each, including relevant weight, aerodynamics and production process related targets.

In particular, the applicants shall clearly document the expected performance targets and demonstrate at project completion their achievement covering:

- Quantified weight and aerodynamic improvements of minimum 2% for the RFE assembly
- Significant reduction in Buy-to-Fly ratio and Total Cost of Ownership of the RFE assembly
- Significant reduction in manufacturing lead time, assembly time, and energy and resource consumption as compared to 2020 reference production system for an A320 FAL
- Enable digital twin and AI-assisted quality assurance systems to improve production efficiency and ergonomics for operators, while ensuring process repeatability and tolerance control.

The precise KPIs and targets, requirements, interfaces and integration of the advanced airframe should be established in close cooperation with the ACIandI (GA n. 101255025) project. The assumptions relative to the aircraft operating envelope and flight mission profile, to the aircraft range, cruise speed, seating capacities and to the main aircraft sizing parameters in general will be provided by this project. It will also support the performance assessment of the RFE when integrated at aircraft level.

The exchanges and delivery of models and data should be adequately planned to support the performance, emissions and life-cycle assessment of the Ultra-Efficient SMR aircraft concepts targeted for EIS in 2035.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.⁶³ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposals shall include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology.

⁶⁰ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

⁶¹ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

⁶² activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027 and/or other EU programmes.

⁶³ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

A robust assessment of uncertainties and risks on achievement of performance targets for all critical technologies, sub-system and system level and their integration effects should be included in the proposal along with potential mitigation actions.

HORIZON-JU-CLEAN-AVIATION-2026-04-SMR-03 Ground Demonstration of Hybrid-Electric Propulsion Architectures for the Ultra-efficient SMR aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below”	
Special eligibility condition - maximum EU contribution per topic	<p>The total indicative funding for the topic is EUR 60 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 3 projects with funding depending on the outcome of the evaluation.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 20 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Indicative project duration	Maximum 36 months.
Special eligibility condition - minimum EU contribution to SMEs, RTOs and universities	<p>A minimum of 15% of the total EU contribution shall be allocated per proposal to Small-Medium Enterprises (SMEs) ⁶⁴, Research and Technology Organisations (RTOs) and/or Universities having a beneficiary status.</p> <p>Proposals not meeting this condition will be declared non-eligible and will not be evaluated.</p> <p>The condition should be met by involving entities under such a legal status in the meaning of Horizon Europe rules across EU Member States and countries associated to Horizon Europe.</p>
Type of Action	Innovation Action.
Technology Readiness Level	<p>A minimum TRL4 shall be justified at project start for the considered technologies based on synergies with activities from Clean Aviation, Clean Sky 2, and other national, regional, and European programmes.</p> <p>Activities are expected to achieve TRL 5 at Hybrid-Electric sub-system integrated at the whole engine level at project completion, as indicated in section ‘Expected Outcome’.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap (aligned with the Clean Aviation SRIA and with the objectives as defined in the Amended Work Programme and Budget 2026-2027) that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft with an entry into service by 2035.</p>

⁶⁴ Legal entities are advised to confirm their SME status. Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422). For more information, please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.
Certification Readiness Level	<p>Activities are expected to achieve CRL5 for critical technologies for the hybrid-electric subsystem at project completion, with a route to CRL6 at aircraft level by the end of the programme, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft with an entry into service by 2035.</p> <p>A guide to the CRL⁶⁵ definitions and criteria to be used is available on the Funding & Tenders portal (F&T portal).</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include aircraft manufacturers, engine OEMs and system integrators, and their supply chain with a proven track record in developing and delivering globally competitive systems to aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development.</p> <p>The consortium configuration should ensure the appropriate industrial, economic and supply chain interests are represented in the project and can ensure the transition from research to product innovation and market deployment by 2035, and with a clearly articulated route that supports the aim of replacing 75% of the operating fleet by 2050.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and certification in the aeronautical supply chain of short-medium range aircraft at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centers that can bring disruptive innovation to the project as proposed.</p> <p>Applicants should demonstrate in the proposal their capability to foster European competitiveness and support the development of the European industrial ecosystem, as well as to foster cooperation and a wide participation of entities across EU Member States and countries associated to Horizon Europe.</p>

⁶⁵ Certification Readiness Level: <https://www.easa.europa.eu/en/newsroom-and-events/news/research-innovation-updates-research-agenda-and-certification-readiness>

Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concepts related to short-medium range aircraft.</p> <p>The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first, second and third CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal).</p>
Impact Monitoring	<p>Under the Impact Monitoring framework as defined in the Amended Work Programme and Budget 2026-2027, the participants selected in this topic shall contribute to the SMR Aircraft Concept and to exchange all relevant information and data with short-medium range aircraft concept project AClandI (GA n. 101255025).</p> <p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact Monitoring mechanism as described in the Clean Aviation SRIA and the Amended Work Programme and Budget 2026-2027 by providing a performance assessment model of the key technologies, sub-systems or systems for possible integration on the future aircraft concept model developed in the short-medium range aircraft concept project to be selected as part of AClandI (GA n. 101255025) project.</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report the progress against the defined performance objectives on a yearly basis by means of specific deliverables planned and proposed in the project in alignment with the CAJU Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft</p>

	concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/2085 ⁶⁶ . Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.
Project Monitoring	The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-milestones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.
In-kind contributions (IKOP/IKAA by JU Members; co-funding by other applicants)	<p>In order to ensure the obligations for in-kind contributions by Members of the CAJU (i.e. “Founding Member”, “Associated Member” and affiliated entities to a Member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/2085¹⁴, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. “Founding Member”, “Associated Member” and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to operation activities and in-kind contribution to additional activities) should be no less than 1.5⁶⁷ times the funding request in aggregate for the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/2085⁶⁸, only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a “Member” of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the project and to the programme/Strategic Research and Innovation Agenda⁶⁹ at large.</p>
Other relevant projects	This project should run in close cooperation and synchronization with relevant Clean Aviation projects AClandI (GA n. 101255025), SWITCH (GA n. 101102006), UNIFIED (GA n. 101256789), TAKE OFF (GA n. 101256962)

⁶⁶ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

⁶⁷ In order to support a leverage factor of no less than the ratio between the contribution from members other than the Union (EUR 2 400 000 000) and the Union financial contribution (EUR 1 700 000 000), which are defined in the Council Regulation (EU) 2021/2085

⁶⁸ Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014

⁶⁹ <https://clean-aviation.eu/sites/default/files/2024-09/2024-Clean-Aviation-SRIA.pdf>

	<p>and those that will be selected under this CfP.</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027, and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first, second and third CAJU CfP; - draw up in their proposal a list of projects selected under the first, second and third call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal's objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6. <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts' evaluation.</p> <p>For further information, please also consult the Rules for Submission, evaluation and selection and the dedicated part in the Amended Work Programme and Budget 2026-2027.</p>
Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p> <p>Applicants are requested to establish contacts with the short-medium range aircraft concept owner⁷⁰ (i.e. consortium leaders of project AClandl (GA n. 101255025)) in view of defining a detailed description of the project technical activities for route to certification.</p> <p>Applicants are requested to establish contact with EASA in view of defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal with an estimate of the budget to cover</p>

⁷⁰ The owner of Clean Aviation aircraft concepts are the project coordinators defined in the topic conditions of HORIZON-JU-CLEAN-AVIATION-2025-03-ACI-01: "Aircraft concept and key technologies integration and impact assessment", which is launched as part of this CfP. Please also refer to the Clean Aviation integrated roadmaps published in the CAJU Amended Work Programme 2026-2027.

	<p>EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of the call.</p>
--	--

Expected Outcome:

Project results are expected to demonstrate hybrid-electric propulsion sub-system integrated into an engine for the Ultra-Efficient Short and Medium Range (SMR) aircraft considered by Clean Aviation SRIA for Entry into Service (EIS) by 2035.

Projects are expected to achieve the following outcomes, for either ducted or unducted engines:

- Develop and demonstrate hybrid-electric sub-system into an SMR engine at TRL5 with a Ground Test Demonstration (GTD) by means of virtual or physical integration, addressing the requirements of the Clean Aviation Ultra-Efficient SMR engine concepts.
- Demonstrate the benefit of such propulsion architectures to target at least 5% in aircraft level CO₂ emissions reduction as a result of the proposed hybrid-electric sub-systems integrated at the aircraft level, excluding SAF effects.
- Develop and demonstrate control and energy-management strategies enabling optimized bi-directional power flow between engine and aircraft systems.
- Demonstrate thermal and electric management at the integrated subsystem level, ensuring stable operation.

- Develop and demonstrate key technologies in the engine necessary to support the hybrid-electric sub-system integration into the full architecture to TRL5.
- Deliver and validate high fidelity models and experimental datasets to validate performance prediction at sub-system and integrated engine level.
- Deliver a roadmap towards system-level integration at TRL6 by programme end to support a future product launch compatible with an EIS by 2035.
- The hybrid-electric sub-systems shall be compliant with the relevant certification requirements, achieving a Certification Readiness Level 5 (CRL5) for critical technologies based on the project GTD, and identify a route to CRL6 at aircraft level by end of the CA programme.

The project results are expected to directly contribute to the performance targets of the Ultra-Efficient SMR aircraft concept with EIS by 2035:

- The propulsion system shall enable and contribute to a 20% CO₂ emissions reduction at aircraft level compared to the 2020 State of the Art aircraft available in service.
- 100% SAF compatibility shall be achieved, enabling 86% net CO₂ reduction when combined with the 30% CO₂ emissions reduction at aircraft level.
- Adequate KPIs at integrated system and key technology levels shall be defined to support the effective achievement of the expected outcomes and shall be aligned with the performance targets section below.

A clear route towards certification, exploitation, and industrialization shall be identified, including the identification of operational requirements to support successful entry into service.

Scope:

The configuration of the Ultra-Efficient SMR aircraft concept proposed in Clean Aviation is expected to maintain a tube and wing and target EIS by 2035. Such an aircraft concept should have a capacity of around 200-250 pax with a design range up to 3000NM, operated on a typical mission of 800NM at cruise speed Ma 0.78. Disruptive technologies related to the airframe are expected to be integrated alongside the ultra-efficient propulsion system, resulting in a 30% CO₂ emission reduction from such technologies, on a typical mission, not taking into consideration the SAF net-effect.

The Clean Aviation SMR propulsion will rely on advanced propulsion architectures – including both ducted and unducted engine concepts – to deliver the efficiency and emission reduction targets of the Ultra-Efficient SMR aircraft concept with EIS by 2035. Across all the concepts, hybrid-electric functionalities are expected to offer major potential for reducing CO₂ emissions, improving transient performance, and optimizing system operation.

This topic is expected to fund up to three projects, each addressing a distinct hybrid-electric architecture supporting either ducted or unducted engine concepts, targeting at least 5% overall performance improvement enabled by hybrid-electric integration at aircraft level. Proposals shall present the candidate hybrid-electric architecture envisaged for the selected engine concept and describe the key enabling components and technologies to be demonstrated, including– but not limited to - electrical power management, thermal integration, control architectures, and validation methods.

The projects should aim to mature and validate hybrid-electric propulsion sub-systems integrated into the full engine up to TRL5, through relevant ground-based demonstrations under operational conditions of the Ultra-Efficient SMR aircraft concept. The ground demonstrations shall address:

- Development and rig-level validation of electric machines, converters, control-units and cooling systems representative of full-scale operation
- Validation of the hybrid-electric sub-system integrated into the full engine

- Development and demonstration of key technologies to support the integrated functionality of the hybrid-electric sub-system in the full engine
- Validation of operability and stability of relevant subsystems through ground test campaigns
- System level architecture design and optimization addressing power and thermal exchange due to engine integration on aircraft systems
- Functional demonstration of power-extraction, injection and transient-assist modes in relevant operational conditions.
- Assessment of reliability, failure modes and maintainability at sub-system and system integrated level ensuring consistency with the future certification requirements.
- Experimental validation of prediction models for performance assessment at sub-system and integrated system level.
- Definition and elaboration of a roadmap describing steps towards TRL6 achievement by 2030-to support a future product launch for the Ultra-Efficient SMR aircraft concept with EIS by 2035.

The demonstration activities shall include:

- System functional and physical integration testing at system and sub-system level via Ground and Rig tests, with representative scale, interfaces, and conditions of the Ultra-Efficient SMR Aircraft concept.
- Propulsive system ground demonstration shall aim to combine the various technology bricks in an integrated manner with the full engine towards TRL5.

The demonstration strategy combining physical demonstrators testing and complementary modelling should be elaborated to demonstrate a TRL5 achievement at integrated full engine level, in alignment with projects SWITCH (GA n. 101102006), UNIFIED (GA n. 101256789) and TAKE OFF (GA n. 101256962). The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity) and emphasize how they address the integration aspects. With regards to certification, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path. It is expected that hybrid-electric propulsion technologies will achieve CRL5 due to project GTD and identify a roadmap to support a CRL6 at aircraft level by end of Clean Aviation programme.

The project is required to exploit the involvement and expertise of EASA in the proposal to de-risk and secure the certification of novel propulsion technologies with the aim to assess and define how the envisaged solutions will have the potential for certification (ref. topic conditions related to “Involvement of EASA”).

The project shall identify and implement synergies with activities funded under research and innovation programmes at regional⁷¹, national⁷² and European⁷³ level and demonstrate how the project will benefit from the specific contributions to the expected outcomes.

Performance Targets:

A number of top-level goals for the Ultra-Efficient SMR Aircraft concept will be the basis for performance targets, in particular:

⁷¹ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

⁷² activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

⁷³ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

- Contribute to 30% CO₂ emission reduction for the ultra-efficient SMR aircraft concept compared to 2020 state-of-the-art aircraft available in service, without the inclusion of 100% SAF fuels, and to 86% CO₂ reductions when 100% SAF is considered.
- Contribute to 20% CO₂ emission reduction for overall propulsion system integrated on to the ultra-efficient SMR aircraft concept compared to 2020 state-of-the-art aircraft. This contribution shall not consider aerodynamic and weight savings from other components.
- Demonstrate a CO₂ emission reduction of at least 5% at aircraft level as a result of the targeted hybrid-electric sub-systems and integration into the engine, excluding SAF effects.
- Evaluation, monitoring and reporting of key parameters needed to assess non-CO₂ effects (including Nox, water, and non-volatile Particulate Matter emissions), to ensure compliance with foreseen regulations and standards for an EIS by 2035.
- Compliance of noise emission levels with ICAO noise standard (chapter 14 noise limits), with adequate certification cumulative noise margin, while considering future updates to the noise standard in view of an EIS by 2035.

The top-level goals shall be broken down in a consistent manner at the level of hybrid-electric sub-systems and their integration into the full engine. Pertinent performance targets including Key Performance Indicators (KPIs) shall be derived for each, including relevant weight and aerodynamics targets.

In particular, the applicants shall clearly document the expected performance targets and demonstrate at project completion their achievement covering:

- Definition of electrical power and other hybrid electric sub-system KPIs compatible with the performance targets at aircraft level, considering the optimal balance between thermal engine optimization and the sizing and utilization of electrical power systems and battery storage.
- Compliance with a high-voltage distribution with a nominal value of 800V and a minimum efficiency of 95% from power source to electrical motor.
- System durability and maintainability consistent with targeted service life.

Differences in power level, voltage, and thermal management requirements are expected due to architecture specific integration and operating conditions. Proposals shall therefore quantitatively justify their targets and ensure their measurable contribution to the overall propulsion system efficiency.

The precise KPIs and targets, requirements, interfaces and integration of the advanced propulsion system should be established in close cooperation with the AClandI (GA n. 101255025) project. The assumptions relative to the aircraft operating envelope and flight mission profile, to the aircraft range, cruise speed, seating capacities and to the main aircraft sizing parameters in general will be provided by this project. It will also support the performance assessment of the propulsion system when integrated at aircraft level.

The exchanges and delivery of models and data should be adequately planned to support the performance, emissions and life-cycle assessment of the Ultra-Efficient SMR aircraft concept targeted for EIS by 2035.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.⁷⁴ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposals shall include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology.

⁷⁴ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

A robust assessment of uncertainties and risks on achievement of performance targets for all critical technologies, sub-system and system level and their integration effects should be included in the proposal along with potential mitigation actions.

HYDROGEN POWERED AIRCRAFT TOPICS

HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-01 Demonstration of advanced FC propulsion technology bricks for the fully-electric hydrogen fuel cell aircraft concept

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 50 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 50 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Special eligibility condition - minimum EU contribution to SMEs, RTOs and universities	<p>A minimum of 15% of the total EU contribution shall be allocated per proposal to Small-Medium Enterprises (SMEs) ⁷⁵, Research and Technology Organisations (RTOs) and/or Universities having a beneficiary status.</p> <p>Proposals not meeting this condition will be declared non-eligible and will not be evaluated.</p> <p>The condition should be met by involving entities under such a legal status in the meaning of Horizon Europe rules across EU Member States and countries associated to Horizon Europe.</p>
Indicative project duration	Maximum 48 months.
Type of Action	Innovation Action.
Technology Readiness Level	<p>In the second phase of the programme, a second design iteration of the critical systems will be performed, supporting both the fuel cell-based propulsion aircraft concept and a hydrogen combustion powertrain aircraft concept defined in the SRIA. The EIS of these aircraft concepts is expected to be in 2040s (instead of 2035 as previously indicated in the SRIA) due to the shift of the ambition announced in 2025 linked to the lack of maturity of the whole ecosystem.</p> <p>In this context, activities in this call for proposals are expected to achieve TRL 5 at component and sub-system level based on the project ground</p>

⁷⁵ Legal entities are advised to confirm their SME status. Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422). For more information, please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>testing, and TRL 4 at system level based on the project virtual engine integration, as indicated in section 'Expected Outcome' and will aim to expand and strengthen the ecosystem, fostering innovation and collaboration across the entire value chain</p> <p>A minimum TRL4 at component and sub-system level shall be justified at project start for the considered technologies based on synergies with activities from Clean Aviation and other national, regional, and European programmes.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap (aligned with the Clean Aviation SRIA and with the objectives as defined in the Amended Work Programme and Budget 2026-2027) that can deliver the technology maturity needed by the end of Clean Aviation programme.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Certification Readiness Level	<p>Activities are expected to achieve CRL 4 at project completion for critical technologies at propulsion system level. A route to achieve CRL6 at propulsion system level must be defined as part of the project, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft concepts.</p> <p>A guide to the CRL⁷⁶ definitions and criteria to be used is available on EASA website.</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include propulsion system integrators and their supply chain with a proven track record in developing and delivering globally competitive propulsion systems to aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development.</p> <p>The consortium configuration should ensure an appropriate diversity of the participants (encompassing a range of skills and organisation types), while also considering the industrial, economic and supply chain interests are adequately represented in the project and can ensure the transition from research to product innovation and market deployment, supporting the development of the ecosystem.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and certification in the aeronautical supply chain at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and</p>

⁷⁶ Certification Readiness Level: <https://www.easa.europa.eu/en/document-library/application-services/innovation-services#goodtoknow>

	<p>include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Applicants should demonstrate in the proposal their capability to foster European competitiveness and support the development of the European industrial ecosystem, as well as to foster cooperation and a wide participation of entities across EU Member States and countries associated to Horizon Europe.</p>
Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concepts related to the fully electric hydrogen fuel cell powered aircraft.</p> <p>The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first and second CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal) in the call topic's documents.</p>
Impact Monitoring	<p>Under the Impact Monitoring framework, as defined in the Amended Work Programme and Budget 2026-2027, the participants selected in this topic shall contribute to the fully-electric hydrogen fuel cell propulsion aircraft concept and to exchange all relevant information and data with aircraft projects to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>.</p>

	<p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact Monitoring mechanism as described in the Clean Aviation SRIA and the Amended Work Programme and Budget 2026-2027 by providing a performance assessment model of the key technologies, sub-systems or systems for possible integration on the future aircraft concept model developed in the projects to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>.</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report on yearly basis by means of specific deliverables included in the project in alignment with the CAJU Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/2085⁷⁷. Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.</p>
Project Monitoring	<p>The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-milestones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>
In-kind contributions (IKOP/IKAA by JU Members; co-funding by other applicants)	<p>In order to ensure the obligations for in-kind contributions by Members of the CAJU (i.e. “Founding Member”, “Associated Member” and affiliated entities to a member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/2085⁷⁸, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. “Founding Member”, “Associated Member” and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to</p>

⁷⁷ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

⁷⁸ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

	<p>operation activities and in-kind contribution to additional activities) should be no less than 1.5⁷⁹ times the funding request in aggregate for the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/2085⁸⁰, only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a “Member” of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the project and to the programme/Strategic Research and Innovation Agenda⁸¹ at large.</p>
Other relevant projects	<p>This project should run in close cooperation and synchronization with projects that will be selected under this CfP.</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027, and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first, second and third CAJU CfP; - draw up in their proposal a list of projects selected under the first, second and third call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal’s objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6. <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts’ evaluation.</p> <p>For further information, please also consult the Rules for Submission, evaluation and selection and the dedicated part in the Amended Work Programme and Budget 2026-2027.</p>

⁷⁹ In order to support a leverage factor of no less than the ratio between the contribution from members other than the Union (EUR 2 400 000 000) and the Union financial contribution (EUR 1 700 000 000), which are defined in the Council Regulation (EU) 2021/2085

⁸⁰ Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014

⁸¹ <https://clean-aviation.eu/sites/default/files/2024-09/2024-Clean-Aviation-SRIA.pdf>

Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p> <p>Applicants are requested to establish contacts with the fully electric hydrogen fuel cell propulsion aircraft concept owner (i.e. consortium leaders of the project to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>) in view of defining a detailed description of the project technical activities for route to certification.</p> <p>Applicants are requested to establish contact with EASA in view of defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal with an estimate of the budget to cover EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of</p>
---------------------	--

	the call.
--	-----------

Expected Outcome:

Projects results are expected to demonstrate an advanced compact and lightweight 2.5MW class fuel cell propulsion system enabling the fully electric hydrogen fuel cell powered aircraft concept addressed by the Clean Aviation SRIA.

Projects are expected to achieve the following outcomes:

- Deliver a compact, lightweight and efficient fuel cell propulsion system with 2.5MW of net ⁸²electrical power at TRL4, by means of an integrated virtual physical and functional demonstration.
- Define, deliver and demonstrate the fuel cell propulsion critical components and sub-systems at TRL5, representative of the fuel cell propulsion system architecture.). Any power scaling of the component or sub-system physical demonstrations shall be representative of the target propulsion architecture and shall be justified as part of the proposal.
- A comprehensive system validation and verification strategy should be developed, to support the definition of the component and sub-system demonstration strategy.
- Demonstrate the critical components and sub-systems manufacturing and assembly processes.
- Deliver a propulsion system integration concept capable of meeting the expected hydrogen safety requirements, and demonstrating the system capability to safely manage hydrogen leakages and the associated hydrogen safety risks (I.e: fire, deflagration, detonation).
- Achieve a Certification Readiness Level 4 (CRL) for critical technologies and identify a route to contribute to achieving CRL6 at aircraft level.

Project results are expected to directly contribute to the performance targets of the fully electric hydrogen fuel cell aircraft concepts:

- The propulsion system shall enable and contribute to demonstrating the viability of the fully electric hydrogen fuel cell powered aircraft concept, including the assessment of the energy efficiency at aircraft level compared to and equivalent Kerosene 2020 State-of-the-Art aircraft available in service.
- The evaluation, monitoring and reporting of key parameters needed to assess noise emissions, shall ensure compliance with foreseen regulations and standards for the expected EIS.
- Adequate KPIs at integrated system and key technology levels shall be defined, to support the effective achievement of the expected outcomes, and shall be aligned with the performance targets defined in the section below.

A clear route towards certification, exploitation, and industrialization shall be identified, including the identification of operational requirements to subsequently support successful entry into service.

Scope:

The configurations of the Hydrogen powered aircraft concepts proposed in Clean Aviation are expected to remain tube and wing. Such aircraft concepts are based on either a direct hydrogen combustion propulsion or a fully electric hydrogen fuel cell propulsion, with a target Entry into Service in the 2040s. For the fully electric hydrogen fuel cell powered aircraft concept, which is in scope of

⁸² Net electrical power is defined as the electrical input power to the electric motor controllers.

this topic, the aircraft capacity should be around 100 pax with a design range up to 1000 NM.

The use of hydrogen in an aircraft will require substantial design changes compared to the aircraft concepts based on traditional hydrocarbon fuels, and is expected to affect most of the critical systems and major aircraft components. In this context, a main driver to demonstrate the viability of the fully electric hydrogen fuel cell powered aircraft concept is the development and integration of an advanced compact, lightweight and high performance hydrogen fuel cell propulsion system.

The projects should aim to develop and demonstrate the system architecture and critical technology bricks enabling the development of a fuel cell propulsion system, with the capacity of delivering a total power of about 2.5MW net power (per engine for a four-engine aircraft configuration), capable to power the fully electric hydrogen fuel cell propulsion aircraft concept addressed in the Clean Aviation programme.

The project scope should include the design, optimisation, manufacturing and testing of the fuel cell propulsion critical components and sub-system representative of the fuel cell propulsion system architecture. This should address:

- The following sub-systems: Fuel cell (including stacks and balance of plant), air supply, thermal management (including ram air channel and heat exchanger), electrical propulsion (e-motor and inverter), electrical power distribution sub-systems.
- The development and demonstration of the propeller and gearbox are considered not mandatory as part of this topic. Nevertheless, a conceptual analysis should be performed to support the propulsion system design and performance assessment (E.g.: Propeller flow field impact on ram air channel cooling flows, impact of the propeller and gearbox physical and structural integration in the propulsion structure and nacelle).
- Deliver a comprehensive Validation and Verification (V&V) strategy to demonstrate the components and sub-system performance in alignment with the fuel cell propulsion system objectives.
- Develop the components and sub-system in co-design with the propulsion system architecture definition.
- Define and demonstrate the sub-system performance gap that should be addressed to meet the fuel cell propulsion system level objectives. The performance gap should be defined departing from clearly defined sub-systems and components demonstrated as part of previous national or European research projects.
- Development and demonstration of the critical manufacturing and assembly, enabling the delivery of a product representative component .

The project scope should also include the design of an advanced, compact, lightweight and energy efficient fully electric fuel cell propulsion system. This shall address the following:

- Demonstrate an integrated fully electric hydrogen fuel cell propulsion system performance by means of a virtual functional and physical modelling.
- Perform optimization studies of the engine, targeting a reduction of the overall system weight, volume, cooling drag and energy consumption while demonstrating compliance with safety, performance and operability requirements. The studies should include:
 - o the definition of the component and sub-system requirements critical to achieve the propulsion system targets.
 - o the definition of the propulsion system structures and nacelle, required to physically integrate the components in a compact shape.

- the optimization of the propulsion system control strategy to meet engine thrust requirements.
 - Deliver a complete fuel cell propulsion system digital twin, representative of the optimized system architecture.
 - Deliver and validate the propulsion control system, demonstrating the capability to meet the aircraft certification requirements (e.g.: rapid thrust availability in aircraft go-around scenarios, one engine inoperative climb).
- Define and demonstrate a holistic hydrogen leakage management system compatible with the envisaged product safety requirements.

The demonstration strategy combining physical demonstrators testing and complementary modelling should be elaborated by applicants to demonstrate a TRL5 achievement at component and sub-system level and a TRL4 at integrated fuel cell propulsion system level, compatible with the expected EIS. The demonstration activities shall include:

- Component and sub-system functional and physical testing via ground and rig test with scale, interfaces and conditions representative of the proposed fully electric hydrogen fuel cell propulsion architecture. The representativity of the sub-system demonstration scale should be clearly justified as part of the proposal.
- Virtual physical system integration and end-to-end functional validation for full range of system operational and environmental conditions.
- A comprehensive safety analysis to demonstrate compliance with aircraft and system requirements.
- Any complementary test required to demonstrate the hydrogen leakage management system capability to detect, isolate and mitigate a hydrogen leakage in a representative physical propulsion system installation environment.
- Applicants can propose alternative means for the system demonstration by delivering a system sub-scale fully integrated on-ground or in-flight demonstration, although not considered mandatory.

The definition of the interfaces with the fuel system and control strategy, to demonstrate the integrated propulsion system at TRL4, should be established in close cooperation with the project selected from the topic “HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-02: Demonstration of an integrated hydrogen fuel system for a fully electric hydrogen fuel cell powered aircraft”. contributing to the hydrogen fuel system development and overall performance assessment.

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity) and emphasize how they address the integration aspects.

With regards to certification, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path. It is expected the advanced fully electric hydrogen fuel cell propulsion system will achieve CRL4. A roadmap to support a CRL6 at aircraft level should be defined by the end of the project.

The project is required to exploit the involvement and expertise of EASA in the proposal to de-risk and secure the certification of novel propulsion technologies with the aim to assess and define how the envisaged solutions will have the potential for certification (ref. topic conditions related to “Involvement of EASA”).

The project shall identify and implement synergies with activities funded under research and

innovation programmes at regional⁸³, national⁸⁴ and European⁸⁵ level, and demonstrate how the project will benefit from these activities by detailing the specific contributions to the expected outcomes.

Performance Targets:

A set of top-level goals for the fully electric hydrogen fuel cell powered aircraft concept will be the basis for performance targets, in particular:

- Demonstrate an overall system efficiency no less than 60%, define as the ratio between the propulsive electrical energy and the Lower Heating Value (LHV) of Hydrogen supplied.
- Demonstrate a power density no less than 1.5kW/kg for the power generation system (fuel cell, air supply, thermal management and hydrogen conditioning sub-systems)
- A power density no less than 1.3kW/kg for the entire propulsion system, excluding the propeller and gearbox (Power generation system, e-motor & MCU, electrical systems, primary and secondary structures, nacelle)
- A power response time from idle to 95% of the rated take-off power or thrust in a time no greater than 5 seconds (Compliance with CS-E 745 Engine Acceleration).
- Evaluation, monitoring and reporting of key parameters needed to assess non-CO2 effects (including water, hydrogen fugitive and operational leakages and any other relevant emissions), to ensure compliance with foreseen regulations and standards for the expected EIS.

These top-level goals should be broken down in a consistent manner at the different levels: from top-level aircraft requirements down to systems, sub-systems, and components level requirements, from where pertinent performance targets including Key Performance Indicators (KPIs) should be derived.

In particular, the applicants shall clearly document the expected performance targets and demonstrate at project completion their achievement covering:

- Definition of engine performance targets aligned with the energy efficiency targets at aircraft level, such as the engine specific fuel/energy consumption, power density and volume envelope.
- Definition of the propulsion system installed drag, including a breakdown of the drag to monitor the drag induced by the cooling ram air channel.
- Compliance with the engine hydrogen leakage management safety objectives.
- System durability, reliability and maintainability consistent with targeted service life.

The precise KPIs and targets for the propulsion system should be established in cooperation with the aircraft integrator (Topic *HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen Powered Aircraft concept and key technologies integration and impact assessment*, to ensure the alignment with aircraft level requirements).

The exchanges and delivery of models and data should be adequately planned to support the performance, emissions and life-cycle assessment of the fully electric hydrogen fuel cell powered aircraft concept.

⁸³ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

⁸⁴ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

⁸⁵ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2022-2023) and/or other EU programmes.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.⁸⁶ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposals shall include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology.

A robust assessment of uncertainties and risks on achievement of performance targets for all critical technologies, sub-system and system level and their integration effects should be included in the proposal along with potential mitigation actions.

⁸⁶ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

HORIZON-JU-CLEAN-AVIATION- 2026-04-HPA-02: Demonstration of an integrated hydrogen fuel system for a fully electric hydrogen fuel cell powered aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 18 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 18 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Special eligibility condition - minimum EU contribution to SMEs, RTOs and universities	<p>A minimum of 15% of the total EU contribution shall be allocated per proposal to Small-Medium Enterprises (SMEs) ⁸⁷, Research and Technology Organisations (RTOs) and/or Universities having a beneficiary status.</p> <p>Proposals not meeting this condition will be declared non-eligible and will not be evaluated.</p> <p>The condition should be met by involving entities under such a legal status in the meaning of Horizon Europe rules across EU Member States and countries associated to Horizon Europe.</p>
Indicative project duration	Maximum 48 months.
Type of Action	Innovation Action.
Technology Readiness Level	<p>In the second phase of the programme, a second design iteration of the critical systems will be performed, supporting both the fuel cell-based propulsion aircraft concept and a hydrogen combustion powertrain aircraft concept defined in the SRIA. The EIS of these aircraft concepts is expected to be in 2040s (instead of 2035 as previously indicated in the SRIA) due to shift of the ambition announced in 2025 linked to the lack of maturity of the whole ecosystem.</p> <p>In this context, activities in this call for proposals are expected to achieve TRL 5 at component level based on the project ground testing, and TRL 4 at system level based on the project hydrogen distribution system demonstration, as indicated in section 'Expected Outcome', and will aim</p>

⁸⁷ Legal entities are advised to confirm their SME status. Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422). For more information, please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>to expand and strengthen the ecosystem, fostering innovation and collaboration across the entire value chain.</p> <p>A minimum TRL4 at component level shall be justified at project start for the considered technologies based on synergies with activities from Clean Aviation, and other national, regional, and European programmes.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap (aligned with the Clean Aviation SRIA and with the objectives as defined in the Amended Work Programme and Budget 2026-2027) that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft concepts with an entry into service by the 2040s.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Certification Readiness Level	<p>Activities are expected to achieve CRL 4 at project completion for critical technologies at propulsion system level. A route to contribute to achieving CRL6 at aircraft level must be defined as part of the project, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft concepts.</p> <p>A guide to the CRL⁸⁸ definitions and criteria to be used is available on EASA website.</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include system integrators and their supply chain with a proven track record in developing and delivering globally competitive systems to aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development.</p> <p>The consortium configuration should ensure an appropriate diversity of the participants (encompassing a range of skills and organisation types), while also considering the industrial, economic and supply chain interests are adequately represented in the project and can ensure the transition from research to product innovation and market deployment, supporting the development of the ecosystem.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and certification in the aeronautical supply chain of regional aircraft at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation</p>

⁸⁸ Certification Readiness Level: <https://www.easa.europa.eu/en/document-library/application-services/innovation-services#goodtoknow>

	<p>of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Applicants should demonstrate in the proposal their capability to foster European competitiveness and support the development of the European industrial ecosystem, as well as to foster cooperation and a wide participation of entities across EU Member States and countries associated to Horizon Europe.</p>
Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concept related to FC-based propulsion Hydrogen powered aircraft concept.</p> <p>The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first and second CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal) in the call topic's documents.</p>
Impact Monitoring	<p>Under the Impact Monitoring framework, as defined in the Amended Work Programme and Budget 2026-2027, the participants selected in this topic shall contribute to the fully electric hydrogen fuel cell powered aircraft concept and to exchange all relevant information and data with aircraft concept projects to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>.</p> <p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact</p>

	<p>Monitoring mechanism as described in the Clean Aviation SRIA and the Amended Work Programme and Budget 2025-2026 by providing a performance assessment model of the key technologies, sub-systems or systems for possible integration on the future aircraft concept model developed in the projects to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>.</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report on yearly basis by means of specific deliverables included in the project in alignment with the CAJU Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/2085⁸⁹. Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.</p>
Project Monitoring	<p>The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-millstones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>
In-kind contributions (IKOP/IKAA by JU Members; co-funding by other applicants)	<p>In order to ensure the obligations for in-kind contributions by Members of the CAJU (i.e. “Founding Member”, “Associated Member” and affiliated entities to a member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/2085⁹⁰, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. “Founding Member”, “Associated Member” and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to operation activities and in-kind contribution to additional activities)</p>

⁸⁹ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

⁹⁰ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

	<p>should be no less than 1.5⁹¹ times the funding request in aggregate for the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/2085⁹², only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a “Member” of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the project and to the programme/Strategic Research and Innovation Agenda⁹³ at large.</p>
Other relevant projects	<p>This project should run in close cooperation and synchronization with the projects selected for the clean hydrogen topic “HORIZON-JU-CLEANH2-2026-03-02: Components Development and Experimental Testing for an Onboard Liquid Hydrogen Supply and Conditioning System in High-Power Fuel Cell Aviation Applications” and those that will be selected under this CfP.</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027, and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first, second and third CAJU CfP; - draw up in their proposal a list of projects selected under the first, second and third call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal’s objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6. <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts’ evaluation.</p>

⁹¹ In order to support a leverage factor of no less than the ratio between the contribution from members other than the Union (EUR 2 400 000 000) and the Union financial contribution (EUR 1 700 000 000), which are defined in the Council Regulation (EU) 2021/2085

⁹² Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014

⁹³ <https://clean-aviation.eu/sites/default/files/2024-09/2024-Clean-Aviation-SRIA.pdf>

Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p> <p>Applicants are requested to establish contacts with the fully electric hydrogen fuel cell propulsion aircraft concept owner (i.e. consortium leaders of the project to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>) in view of defining a detailed description of the project technical activities for route to certification.</p> <p>Applicants are requested to establish contact with EASA in view of defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal with an estimate of the budget to cover EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of</p>
---------------------	--

	the call.
--	-----------

Expected Outcome:

Project results are expected to demonstrate a lightweight and reliable low pressure pump-fed integrated hydrogen fuel system at TRL4, for the fully electric hydrogen fuel cell propulsion aircraft concept addressed by the Clean Aviation SRIA.

Projects are expected to achieve the following outcomes:

- Deliver and demonstrate an optimized low pressure integrated liquid hydrogen fuel system at TRL4, demonstrating the system capability to deliver the hydrogen fuel at the required conditions.
- Deliver and demonstrate the LH2 storage pressure monitoring and control system at TRL4, including the overpressure (venting) management system.
- Deliver and demonstrate the hydrogen fuel system critical components at TRL5, compatible with the system architecture requirements and demonstrating the components performance and capability to meet the full spectrum operational requirements
- Demonstrate the hydrogen fuel system critical components manufacturing, assembly and maintenance processes, demonstrating production-representative maturity for the components design selected.
- Develop and demonstrate a holistic hydrogen leakage management strategy compatible with the envisaged product safety requirements.
- Achieve a Certification Readiness Level 4 (CRL) for critical technologies and identify a route to contribute to achieving CRL6 at aircraft level.

The project results are expected to directly contribute to the performance targets of the fully electric hydrogen fuel cell powered aircraft concepts:

- The low-pressure hydrogen distribution and conditioning system shall contribute to demonstrating the viability of the fully electric hydrogen fuel cell powered aircraft concept, including the assessment of the energy efficiency at aircraft level compared to an equivalent Kerosene 2020 State-of-the-Art aircraft available in service.
- Adequate KPIs at integrated system and key technology levels shall be defined, to support the effective achievement of the expected outcomes, and shall be aligned with the performance targets defined in the section below.

A clear route towards certification, exploitation, and industrialization shall be identified, including the identification of operational requirements to subsequently support successful entry into service.

Scope:

The configurations of the Hydrogen powered aircraft concepts proposed in Clean Aviation are expected to remain tube and wing configuration, based on either a direct hydrogen combustion propulsion or a fully-electric hydrogen fuel cell propulsion, with a target Entry into Service in the 2040s. This topic focuses on the fully electric hydrogen fuel cell aircraft concept, which is expected to have a capacity around 100 passengers and a minimum design range of 1000 nautical miles.

The use of hydrogen in an aircraft will require substantial design changes compared to the aircraft concepts based on traditional hydrocarbon fuels. In this context, a main driver to demonstrate the viability of the fully electric hydrogen fuel cell aircraft will be the development and integration of a safe lightweight and reliable low pressure pump fed liquid hydrogen fuel system, capable of delivering and conditioning hydrogen, stored at the aircraft fuselage rear section, to the engines expected to be located under the aircraft wings.

The project aims to develop, deliver and demonstrate the integrated low pressure hydrogen fuel system, enabling the supply of a 2.5MW class (per engine, for a four-engine aircraft configuration), capable of to power the Clean Aviation fully electric hydrogen fuel cell powered aircraft concepts.

The project scope shall include the design and demonstration of an integrated low pressure pump-fed hydrogen fuel system on ground, including all the sub-systems required to distribute, supply, condition, control and meter the hydrogen to the consumer. This shall address the following:

- Optimization of the overall fuel system mass and performance, including the impact of the fuel system architecture on the hydrogen tank. The development of a hydrogen storage vessel (tank) is not in scope of this project but should be considered as part of the optimisation studies.
- Definition and demonstration on ground of the LH2 tank pressure and flow control system for a pump-fed tank architecture; hydrogen monitoring and metering and control systems.
- Development and demonstration of the overpressure management system, including the valves and lines required to safely vent the hydrogen in case of an overpressure event.
- Deliver a hydrogen distribution integration concept capable of meeting the expected hydrogen safety requirements, demonstrating the system capability to safely manage failures, particularly hydrogen leakages and the associated hydrogen safety risks.
- Deliver a comprehensive safety and reliability analysis to demonstrate compliance with aircraft and system requirements.

- Develop and virtually demonstrate the coupling of the liquid hydrogen fuel system to the fuel cell engine, including the demonstration of the engine thrust control system capability to meet the engine and the aircraft certification and performance requirements.

The project scope should also include the development demonstration of the fuel distribution system critical components, optimized in conjunction with the distribution system architecture, This should address:

- A low pressure hydrogen pump, capable of delivering the pressure and flow required by the hydrogen fuel cell engine, as specify in the performance target section.
- A hydrogen vaporization and conditioning heat exchanger, required to supply the hydrogen at the required temperature. Optimisation of the heat exchanger to re-use waste heat produced by the hydrogen fuel cell engine should be considered.
- Complete distribution system components from LH2 tank interface to the consumer interface⁹⁴, including Pipes, valves, sensors, vents, regulators, filters and any other required equipment.

The demonstration strategy combining physical demonstrators testing and complementary modelling should be elaborated by applicants to demonstrate a TRL5 achievement at component level and a TRL4 at integrated system level, compatibly with an EIS in the 2040s. The demonstration activities

⁹⁴ The FC consumer interface is defined as the point where the H2 is provided at the flow and temperature conditions defined in the topic performance section

shall include:

- Ground testing of critical components in relevant environment to demonstrate compliance with aeronautical representative environmental conditions (e.g. vibration, shock) and operational conditions (e.g. dynamic loads, thermal and mechanical cycling, chill down and start-up procedures)
- Virtual integration and hardware-in-the-loop simulations,
- Multi-physics simulations (fluid, thermal, mechanical) capable of modelling transient behaviour , including 2-phase fluid operations.
- On ground integrated cryogenic testing of the complete low pressure hydrogen fuel system with representative scales and test conditions.
- Demonstration of hydrogen storage pressure management and flow metering functions.
- Any complementary test to demonstrate the hydrogen leakage management system capability to detect, isolate and mitigate a hydrogen leakage in a representative fuel system installation environment.

The strategy for development and demonstration of integrated low pressure liquid hydrogen fuel system at TRL4, should be elaborated in close cooperation and in synergy with the projects selected for the Clean Hydrogen Joint Undertaking (JU) topic “HORIZON-JU-CLEANH2-2026-03-02: Components Development and Experimental Testing for an Onboard Liquid Hydrogen Supply and Conditioning System in High-Power Fuel Cell Aviation Applications”. More specifically, the Clean Hydrogen JU project will focus on the development of the non-architecturally driving fuel system components, in alignment with the system requirements defined by project selected under this topic.

The definition of the hydrogen fuel supply requirements to demonstrate the low pressure pump-fed hydrogen fuel system at TRL4, should be established in close cooperation with the project selected from the topic “HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-01 Demonstration of advanced FC propulsion techno-bricks for the fully electric hydrogen fuel cell aircraft concept”.

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity) and emphasize how they address the integration aspects.

With regards to certification, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path. It is expected the hydrogen distribution system for fully electric hydrogen fuel cell powered aircraft will achieve CRL4. A roadmap to support a CRL6 at aircraft level should be defined by the end of the project.

The project is required to exploit the involvement and expertise of EASA in the proposal to de-risk and secure the certification of novel fuel system technologies with the aim to assess and define how the envisaged solutions will have the potential for certification (ref. topic conditions related to “Involvement of EASA”).

The project shall identify and implement synergies with activities funded under research and

innovation programmes at regional⁹⁵, national⁹⁶ and European⁹⁷ level, and demonstrate how the project will benefit from these activities by detailing the specific contributions to the expected outcomes.

Performance Targets:

A set of top-level goals for the fully electric hydrogen fuel cell powered aircraft concept will be the basis for the fuel system performance targets, in particular:

- Demonstrate a hydrogen supply mass flow around 0.27 Kg/s in peak condition and around 0.07 Kg/s in nominal cruise condition
- Demonstrate a sub-system weight in the range of 2-3 tons, for the sub-systems developed under this topic as defined in the scope section. The sub-system contribution to achieving the overall fuel system weight target, should be justified as part of the proposal
- Demonstrate a hydrogen supply pressure no less than 3 bars and a supply temperature no less than 330K.
- A system mean time between failures (MTBF⁹⁸) no less than 3000 flight hours
- An engine thrust response time from idle to 95% of the rated take-off thrust in no more than 5 seconds (Compliance with CS-E 745 Engine Acceleration)

The top-level goals should be broken down in a consistent manner at the different levels: from top-level aircraft requirements down to systems, sub-systems, and components level requirements. Pertinent performance targets including Key Performance Indicators (KPIs) shall be derived for each, including relevant weight, aerodynamics and performance targets.

In particular, the applicants shall clearly document the expected performance targets and demonstrate at project completion their achievement covering:

- Definition of the hydrogen fuel system installation performance targets aligned with the aircraft level targets, such as the weight breakdown, energy consumption and installed drag shall be provided.
- Compliance with the hydrogen leakage management system safety objectives.
- System durability, reliability and maintainability consistent with targeted service life.
- Evaluation, monitoring and reporting of hydrogen fugitive and operational leakages.

The precise KPIs and targets for the propulsion system should be established in cooperation with the aircraft integrator (Topic *HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01Hydrogen Powered Aircraft concept and key technologies integration and impact assessment*) to ensure the alignment with aircraft-level requirements.

The exchanges and delivery of models and data should be adequately planned to support the performance, emissions and life-cycle assessment of the fully electric hydrogen fuel cell powered

⁹⁵ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

⁹⁶ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

⁹⁷ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2022-2023) and/or other EU programmes.

⁹⁸ Defined as the number of flight hours with a maximum of one aircraft-on-ground event (AOG) because of a failure in the entire onboard fuel storage, supply and conditioning system

aircraft concept.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.⁹⁹ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposals shall include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology.

A robust assessment of uncertainties and risks on achievement of performance targets for all critical technologies, sub-system and system level and their integration effects should be included in the proposal along with potential mitigation actions.

⁹⁹ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-03 Demonstration of an advanced Low NOx H2C
Propulsion System for the direct hydrogen combustion aircraft concept

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 15 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 15 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Special eligibility condition - minimum EU contribution to SMEs, RTOs and universities	<p>A minimum of 15% of the total EU contribution shall be allocated per proposal to Small-Medium Enterprises (SMEs) ¹⁰⁰, Research and Technology Organisations (RTOs) and/or Universities having a beneficiary status.</p> <p>Proposals not meeting this condition will be declared non-eligible and will not be evaluated.</p> <p>The condition should be met by involving entities under such a legal status in the meaning of Horizon Europe rules across EU Member States and countries associated to Horizon Europe.</p>
Indicative project duration	Maximum 48 months.
Type of Action	Innovation Action.
Technology Readiness Level	<p>In the second phase of the programme, a second design iteration of the critical systems will be performed, supporting both the fuel cell-based propulsion aircraft concept and a hydrogen combustion powertrain aircraft concept defined in the SRIA. The EIS of these aircraft concepts is expected to be in 2040s (instead of 2035 as previously indicated in the SRIA) due to the shift of the ambition announced in 2025 linked to the lack of maturity of the whole ecosystem.</p> <p>In this context, activities in this call for proposals are expected to achieve TRL 5 at component and sub-system level based on the project ground testing, and TRL 4 at system level based on the project virtual engine integration, as indicated in section 'Expected Outcome', and will aim to</p>

¹⁰⁰ Legal entities are advised to confirm their SME status. Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422). For more information, please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>expand and strengthen the ecosystem, fostering innovation and collaboration across the entire value chain.</p> <p>A minimum TRL4 at component level shall be justified at project start for the considered technologies based on synergies with activities from Clean Aviation, and other national, regional, and European programmes.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap (aligned with the Clean Aviation SRIA and with the objectives as defined in the Amended Work Programme and Budget 2026-2027) that can deliver the technology maturity needed by the end of Clean Aviation programme.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Certification Readiness Level	<p>Activities are expected to achieve CRL 4 at project completion for critical technologies at propulsion system level. A route to achieve CRL6 at propulsion system level must be define as part of the project, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft concepts.</p> <p>A guide to the CRL¹⁰¹ definitions and criteria to be used is available on EASA website.</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include propulsion system integrators and their supply chain with a proven track record in developing and delivering globally competitive propulsion systems to aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development.</p> <p>The consortium configuration should ensure an appropriate diversity of the participants (encompassing a range of skills and organisation types), while also considering the industrial, economic and supply chain interests are adequately represented in the project and can ensure the transition from research to product innovation and market deployment, supporting the development of the ecosystem.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and certification in the aeronautical supply chain at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation</p>

¹⁰¹ Certification Readiness Level: <https://www.easa.europa.eu/en/document-library/application-services/innovation-services#goodtoknow>

	<p>of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Applicants should demonstrate in the proposal their capability to foster European competitiveness and support the development of the European industrial ecosystem, as well as to foster cooperation and a wide participation of entities across EU Member States and countries associated to Horizon Europe.</p>
Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concepts related to the direct hydrogen combustion propulsion aircraft.</p> <p>The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first and second CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal) in the call topic's documents.</p>
Impact Monitoring	<p>Under the Impact Monitoring framework, as defined in the Amended Work Programme and Budget 2026-2027, the participants selected in this topic shall contribute to the direct hydrogen combustion propulsion Aircraft concept and to exchange all relevant information and data with aircraft projects to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>.</p> <p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact</p>

	<p>Monitoring mechanism as described in the Clean Aviation SRIA and the Amended Work Programme and Budget 2026-2027 by providing a performance assessment model of the key technologies, sub-systems or systems for possible integration on the future aircraft concept model developed in the projects to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>.</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report on yearly basis by means of specific deliverables included in the project in alignment with the CAJU Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/2085¹⁰². Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.</p>
Project Monitoring	<p>The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-milestones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>
In-kind contributions (IKOP/IKAA by JU Members; co-funding by other applicants)	<p>In order to ensure the obligations for in-kind contributions by Members of the CAJU (i.e. “Founding Member”, “Associated Member” and affiliated entities to a member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/2085¹⁰³, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. “Founding Member”, “Associated Member” and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to operation activities and in-kind contribution to additional activities)</p>

¹⁰² Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

¹⁰³ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

	<p>should be no less than 1.5¹⁰⁴ times the funding request in aggregate for the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/2085¹⁰⁵, only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a “Member” of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the project and to the programme/Strategic Research and Innovation Agenda¹⁰⁶ at large.</p>
Other relevant projects	<p>This project should run in close cooperation and synchronization with projects that will be selected under this CfP.</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027, and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first, second and third CAJU CfP; - draw up in their proposal a list of projects selected under the first, second and third call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal’s objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6. <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts’ evaluation.</p> <p>For further information, please also consult the Rules for Submission, evaluation and selection and the dedicated part in the Amended Work Programme and Budget 2026-2027.</p>

¹⁰⁴ In order to support a leverage factor of no less than the ratio between the contribution from members other than the Union (EUR 2 400 000 000) and the Union financial contribution (EUR 1 700 000 000), which are defined in the Council Regulation (EU) 2021/2085

¹⁰⁵ Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014

¹⁰⁶ <https://clean-aviation.eu/sites/default/files/2024-09/2024-Clean-Aviation-SRIA.pdf>

Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p> <p>Applicants are requested to establish contacts with the direct hydrogen combustion propulsion aircraft concept owner (i.e. consortium leaders of the project to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>) in view of defining a detailed description of the project technical activities for route to certification.</p> <p>Applicants are requested to establish contact with EASA in view of defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal with an estimate of the budget to cover EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of</p>
---------------------	---

	the call.
--	-----------

Expected Outcome:

Project results are expected to demonstrate an advanced low NOx hydrogen combustor and an efficient hydrogen combustion engine architecture, enabling the direct hydrogen combustion aircraft concept addressed by the Clean Aviation SRIA.

Projects are expected to achieve the following outcomes:

- Deliver an engine architecture design, including the engine fuel system at TRL4, demonstrating the engine performance and operability.
- Define a system control framework for the end-to-end engine thrust control function, including the fuel system and the storage system.
- Deliver an advanced low NOx emissions hydrogen combustor with optimised combustion and operability performance at TRL5, demonstrating the combustor emissions, operability and capability to meet the product lifetime requirements.
- Demonstrate the combustor manufacturing, assembly and repair processes, including production-representative maturity for the combustor design selected.
- Deliver an engine integration concept capable of meeting the expected hydrogen safety requirements, demonstrating the system capability to safely manage hydrogen leakages and the associated hydrogen safety risks (I.e: fire, deflagration, detonation).
- Achieve a Certification Readiness Level 4 (CRL) for critical technologies and identify a route to contribute to achieving CRL6 at aircraft level.

The project results are expected to directly contribute to the performance targets of the direct hydrogen combustion propulsion aircraft concepts:

- The propulsion system shall contribute to demonstrating the viability of the direct hydrogen combustion propulsion aircraft concept, including the assessment of the energy efficiency at aircraft level compared to an equivalent Kerosene 2020 State-of-the-Art aircraft available in service.
- The evaluation, monitoring and reporting of key parameters needed to assess noise emissions, shall ensure compliance with foreseen regulations and standards for the expected EIS.
- Adequate KPIs at integrated system and key technology levels shall be defined, to support the effective achievement of the expected outcomes, and shall be aligned with the performance targets defined in the section below.

A clear route towards certification, exploitation, and industrialization shall be identified, including the identification of operational requirements to support successful entry into service.

Scope:

The configurations of the Hydrogen Powered Aircraft concepts addressed in Clean Aviation are expected to remain a tube and wing. Such aircraft concepts are based on either a direct hydrogen combustion propulsion or a fully-electric hydrogen fuel cell propulsion, with a target Entry into Service in the 2040s.

The use of hydrogen in an aircraft will require substantial design changes compared to the aircraft concepts based on traditional hydrocarbon fuels. The adoption and integration of hydrogen-based technologies are expected to affect most of the critical systems and major aircraft components. In this

context, a main driver to demonstrate the viability of the direct hydrogen combustion propulsion aircraft concept is the development and integration of low NO_x emissions propulsion system capable of operating safely and efficiently with hydrogen. Alternative dual-fuel engine configurations, based on SAF and Hydrogen, are in scope of this topic provided the engine can be operated across the entire flight cycle using hydrogen.

The projects should aim to develop a low NO_x propulsion system architecture and demonstrate the critical technology bricks enabling a direct hydrogen combustion engine, with the capacity of delivering 150kN of thrust (per engine, for a two-engine aircraft configuration) capable to power the direct hydrogen combustion propulsion aircraft concept targeted in the Clean Aviation programme. Such an aircraft is expected to have a capacity between 120 and 150 passengers and a minimum design range of 1400 nautical miles.

The project scope should include the design, optimization, manufacturing and testing of a full scale advanced product representative low NO_x combustor. This should address:

- Demonstration of the thermoacoustic & operability behaviour across the full operating range.
- Characterization of the flame-holding & flashback behaviour for the full engine cycle conditions.
- Demonstration of the engine cycle transient behaviour, particularly ignition, for the proposed architecture.
- Demonstration of combustor integrity and lifetime for the full spectrum of operational environment conditions, including an assessment of the impact of the combustor traverse on components downstream the combustor.
- Development and demonstration of a manufacturing process for the down selected low NO_x combustor design, enabling the delivery of a product representative component.
- Demonstrate combustor NO_x emissions for the full engine cycle, including the characterization of the fuel temperature effect on combustor emissions and operability.

The project scope should also include the design of a Low NO_x hydrogen direct combustion propulsion system architecture, optimized in conjunction with the overall hydrogen conditioning and distribution system. This shall address the following:

- Perform optimization studies of the engine and complete fuel system, targeting a reduction of the overall system weight and energy consumption while demonstrating compliance with safety, performance and operability requirements. The studies should explore:
 - o the use of the fuel as a heat sink source to provide engine cooling functionality.
 - o the optimization of the fuel system requirements, including the definition of the functional boundaries between the engine and the fuel system.
 - o the minimization of NO_x emissions using the fuel temperature. The assessment shall also consider any potential negative impact on engine operability.
 - o the optimization of the engine and fuel system control strategy to meet engine thrust requirements.
- Deliver a complete engine digital twin, to be coupled to the fuel system digital twin, representative of the optimized system architecture.
- Define the hydrogen distribution and engine fuel system components requirements, aligned with the proposed engine system architecture.
- Deliver and validate the engine control system, demonstrating the capability to meet the aircraft certification requirements (e.g.: rapid thrust availability in aircraft go-around scenarios, one engine inoperative climb).

- Define and demonstrate a holistic hydrogen leakage management system compatible with the envisaged product safety requirements.

The demonstration strategy combining physical demonstrators testing and complementary modelling should be elaborated by applicants to demonstrate a TRL5 achievement at combustor level and a TRL4 at integrated engine level, compatible with the expected EIS. The demonstration activities shall include:

- Appropriate use of single cup, sector and full annular combustor rig tests.
- Virtual integration and hardware-in-the-loop simulations.
- End-to-end functional validation for full range of system operational and environmental conditions.
- A comprehensive safety analysis to demonstrate compliance with aircraft and system requirements.
- Any complementary test required to demonstrate the hydrogen leakage management system capability to detect, isolate and mitigate a hydrogen leakage in a representative physical engine installation environment.

The definition of the engine fuel system architecture and control strategy, to demonstrate the engine and fuel distribution system TRL4, should be established in close cooperation with the project selected from the topic “HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-04: Demonstration of a hydrogen distribution system for a direct hydrogen combustion propulsion aircraft”.

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity) and emphasize how they address the integration aspects.

With regards to certification, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path. It is expected LOW Nox H2C propulsion system will achieve CRL4. A roadmap to support a CRL6 at aircraft level should be defined by the end of the project.

The project is required to exploit the involvement and expertise of EASA in the proposal to de-risk and secure the certification of novel propulsion technologies with the aim to assess and define how the envisaged solutions will have the potential for certification (ref. topic conditions related to “Involvement of EASA”).

The project shall identify and implement synergies with activities funded under research and innovation programmes at regional¹⁰⁷, national¹⁰⁸ and European¹⁰⁹ level, and demonstrate how the project will benefit from these activities by detailing the specific contributions to the expected outcomes.

Performance Targets:

A set of top-level goals for the direct hydrogen combustion propulsion aircraft concept will be the basis for the performance targets, in particular:

- Demonstrate a NOX emission index reduction between 30% and 70% against CAEP8 regulation.

¹⁰⁷ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

¹⁰⁸ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

¹⁰⁹ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

- Demonstrate an engine thrust response time from idle to 95% of the rated take-off thrust in no more than 5 seconds (Compliance with CS-E 745 Engine Acceleration).
- Demonstrate a component lifetime equivalent to current state-of-the-Art kerosene engines.
- Demonstrate a combustor manufacturing process readiness compatible with expected product industrialization requirements.
- Evaluation, monitoring and reporting of key parameters needed to assess non-CO2 effects (including NOx, water, non-volatile Particulate Matter emissions and hydrogen fugitive and operational emissions), to ensure compliance with foreseen regulations and standards for the expected EIS.

The top-level goals should be broken down in a consistent manner at the different levels: from top-level aircraft requirements down to systems, sub-systems, and components level requirements. Pertinent performance targets including Key Performance Indicators (KPIs) shall be derived for each, including relevant weight, aerodynamics and performance targets.

In particular, the applicants shall clearly document the expected performance targets and demonstrate at project completion their achievement covering:

- Definition of engine performance targets aligned with the energy efficiency targets at aircraft level, such as the engine specific fuel/energy consumption, power density and installed drag shall be provided.
- Compliance with the engine hydrogen leakage management safety objectives.
- System durability, reliability and maintainability consistent with targeted service life.

The precise KPIs and targets for the propulsion system should be established in cooperation with the project selected from the topic *“HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen Powered Aircraft concept and key technologies integration and impact assessment”* to ensure the alignment with aircraft level requirements.

The exchanges and delivery of models and data should be adequately planned to support the performance, emissions and life-cycle assessment of the direct hydrogen combustion propulsion aircraft concept.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹¹⁰ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposals shall include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology.

A robust assessment of uncertainties and risks on achievement of performance targets for all critical technologies, sub-system and system level and their integration effects should be included in the proposal along with potential mitigation actions.

¹¹⁰ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-04: Demonstration of a hydrogen distribution system for a direct hydrogen combustion propulsion aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Special eligibility condition - maximum EU contribution per topic	<p>The maximum EU contribution for the topic is EUR 18 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Special eligibility condition - maximum EU contribution per project	<p>The maximum EU contribution per project funded under this topic is EUR 18 million.</p> <p>Proposals requesting an EU contribution above the maximum amount specified above will be declared non-eligible and will not be evaluated.</p>
Special eligibility condition - minimum EU contribution to SMEs, RTOs and universities	<p>A minimum of 15% of the total EU contribution shall be allocated per proposal to Small-Medium Enterprises (SMEs) ¹¹¹, Research and Technology Organisations (RTOs) and/or Universities having a beneficiary status.</p> <p>Proposals not meeting this condition will be declared non-eligible and will not be evaluated.</p> <p>The condition should be met by involving entities under such a legal status in the meaning of Horizon Europe rules across EU Member States and countries associated to Horizon Europe.</p>
Indicative project duration	Maximum 48 months.
Type of Action	Innovation Action.
Technology Readiness Level	<p>In the second phase of the programme, a second design iteration of the critical systems will be performed, supporting both the fuel cell-based propulsion aircraft concept and a hydrogen combustion powertrain aircraft concept defined in the SRIA. The EIS of these aircraft concepts is expected to be in 2040s (instead of 2035 as previously indicated in the SRIA) due to the shift of the ambition announced in 2025 linked to the lack of maturity of the whole ecosystem.</p> <p>In this context, activities in this call for proposals are expected to achieve TRL 5 at component level based on the project ground testing, and TRL 4 at system level based on the project hydrogen distribution system demonstration, as indicated in section 'Expected Outcome', and will aim</p>

¹¹¹ Legal entities are advised to confirm their SME status. Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422). For more information, please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>to expand and strengthen the ecosystem, fostering innovation and collaboration across the entire value chain.</p> <p>A minimum TRL4 at component level shall be justified at project start for the considered technologies based on synergies with activities from Clean Aviation, and other national, regional, and European programmes.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap (aligned with the Clean Aviation SRIA and with the objectives as defined in the Amended Work Programme and Budget 2026-2027) that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft concepts with an entry into service by the 2040s.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Certification Readiness Level	<p>Activities are expected to achieve CRL 4 at project completion for critical technologies at system level. A route to contribute to achieving CRL6 at aircraft level must be define as part of the project, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the CRL steps and a roadmap that can support the inclusion of project results in new aircraft concepts.</p> <p>A guide to the CRL¹¹² definitions and criteria to be used is available on EASA website.</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia that include system integrators and their supply chain with a proven track record in developing and delivering globally competitive systems to aircraft programmes, as well as key contributors from the domain of academic/scientific research and technology development.</p> <p>The consortium configuration should ensure an appropriate diversity of the participants (encompassing a range of skills and organisation types), while also considering the industrial, economic and supply chain interests are adequately represented in the project and can ensure the transition from research to product innovation and market deployment, supporting the development of the ecosystem.</p> <p>Applicant(s) should be able to manage large and complex international aeronautical programmes demonstrating a track record of successful design, development and certification in the aeronautical supply chain of regional aircraft at the level relevant to the topic's scope as described.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation</p>

¹¹² Certification Readiness Level: <https://www.easa.europa.eu/en/document-library/application-services/innovation-services#goodtoknow>

	<p>of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Applicants should demonstrate in the proposal their capability to foster European competitiveness and support the development of the European industrial ecosystem, as well as to foster cooperation and a wide participation of entities across EU Member States and countries associated to Horizon Europe.</p>
Membership/Consortium Agreement	<p>The topic is identified as a key contributor to the overall aircraft concept related to the direct hydrogen propulsion aircraft.</p> <p>The JU Members participating in the project(s) selected under this topic must ensure compliance with the existing Membership Agreement. The participants to the project must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.</p>
Cooperation Agreement	<p>In order to ensure a programmatic approach and implementation of the programme, project(s) launched under this topic should share/exchange, as appropriate, relevant results generated in the project with other relevant CAJU projects.</p> <p>For this purpose, participants selected under this topic that are not signatory parties to the Cooperation Agreement currently in force between the projects selected under the first and second CAJU Calls for Proposals at the time of the signature of the Grant will be asked to accede the Cooperation Agreement within one month from grant signature.</p> <p>For further details as to the CAJU projects with which cooperation of the selected project under this topic will be expected, see under "other relevant projects".</p> <p>A model of the Cooperation Agreement is available on the Funding & Tenders portal (F&T portal) in the call topic's documents.</p>
Impact Monitoring	<p>Under the Impact Monitoring framework, as defined in the Amended Work Programme and Budget 2026-2027, the participants selected in this topic shall contribute to the direct hydrogen combustion propulsion aircraft concept and to exchange all relevant information and data with aircraft concept projects to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>.</p> <p>The exchange should be implemented on a yearly basis as well as a final impact/performance assessment at project completion including a TRL and CRL assessment, in order to contribute to the Clean Aviation Impact Monitoring mechanism as described in the Clean Aviation SRIA and the</p>

	<p>Amended Work Programme and Budget 2025-2026 by providing a performance assessment model of the key technologies, sub-systems or systems for possible integration on the future aircraft concept model developed in the projects to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>.</p> <p>The participants selected in this topic shall provide an estimate of the performance objectives at project start and will report on yearly basis by means of specific deliverables included in the project in alignment with the CAJU Impact Monitoring Framework.</p> <p>This approach will serve to assess the performance of the aircraft concepts as described in the Amended Work Programme and Budget 2026-2027 and against the programme specific objectives listed in the Council Regulation (EU) 2021/2085¹¹³. Applicants must ensure that their internal Consortium Agreement includes the necessary provisions to allow such required exchanges of information and data outside the consortium.</p>
Project Monitoring	<p>The JU will perform a number of gate reviews with a key review no later than month 11 (or at a fixed date, to be determined by the Granting Authority and the coordinator in accordance with the timeline of the key-millstones) to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>
In-kind contributions (IKOP/IKAA by JU Members; co-funding by other applicants)	<p>In order to ensure the obligations for in-kind contributions by Members of the CAJU (i.e. "Founding Member", "Associated Member" and affiliated entities to a member) can be fulfilled as set in Article 61 of the Council Regulation (EU) 2021/2085¹¹⁴, deliverables on in-kind contributions will be set in the grant agreements for the projects selected under this topic.</p> <p>The Members responding to this topic (i.e. "Founding Member", "Associated Member" and affiliated entities) must describe in the proposal the planned in-kind contributions to be provided in the course of the project. In-kind contributions to additional activities should be declared via the template model available on the F&T portal. The amount of the total in-kind contributions (i.e. in-kind contribution to operation activities and in-kind contribution to additional activities) should be no less than 1.5¹¹⁵ times the funding request in aggregate for</p>

¹¹³ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

¹¹⁴ Council Regulation (EU) 2021/2085 of 19 November 2021. Official Journal: OJ L 427, 30.11.2021, p. 17–119. (<https://data.consilium.europa.eu/doc/document/ST-12156-2021-INIT/en/pdf>)

¹¹⁵ In order to support a leverage factor of no less than the ratio between the contribution from members other than the Union (EUR 2 400 000 000) and the Union financial contribution (EUR 1 700 000 000), which are defined in the Council Regulation (EU) 2021/2085

	<p>the proposal.</p> <p>Considering that in accordance with Article 61 of the Council Regulation (EU) 2021/2085¹¹⁶, only the Members of the CAJU are able to provide and report on the required minimum level of in-kind contributions, participants in the proposal who are not a “Member” of the CAJU should explain in the proposal which resources, key competences, technical and financial contributions they will be able to provide to the project and to the programme/Strategic Research and Innovation Agenda¹¹⁷ at large.</p>
Other relevant projects	<p>This project should run in close cooperation and synchronization with relevant Clean Aviation projects HYDEA (GA n. 101102019), CAVENDISH (GA n. 101102000) and those that will be selected under this CfP.</p> <p>In particular, the applicants should:</p> <ul style="list-style-type: none"> - ensure their proposal is aligned with the Gantt chart(s) of the relevant thrust(s) as published in the Amended Work Programme and Budget 2026-2027, and duly consider interfaces and interdependencies therein, in order to ensure a consistent and coordinated approach with the other relevant projects selected under this call and the first, second and third CAJU CfP; - draw up in their proposal a list of projects selected under the first, second and third call and a list of topics published under this call for which a cooperation and access rights will be needed in order to achieve the proposal’s objectives and implement the impact monitoring framework. - define a deliverable which will provide the specific technical requirements, the necessary data/information exchanges and the delivery schedule thereof with respect to the other relevant projects to support an integrated programme planning across the projects with interfaces, including a list of milestones and deliverables across the contributing projects. This deliverable must be issued by the applicants by month 6. <p>During grant preparation, the JU may propose amendments or additions to the list of other relevant projects on the basis of the experts’ evaluation.</p>
Involvement of EASA	<p>Each project is required to consider the involvement of EASA in the proposal for their expertise to de-risk and secure the certification of aircraft embodying novel technologies. Each consortium shall define in the proposal how the envisaged solutions developed during the implementation of the project will achieve the CRL target prescribed in this topic.</p>

¹¹⁶ Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014

¹¹⁷ <https://clean-aviation.eu/sites/default/files/2024-09/2024-Clean-Aviation-SRIA.pdf>

	<p>Applicants are requested to establish contacts with the direct hydrogen combustion propulsion aircraft concept owner (i.e. consortium leaders of the project to be selected as part of <i>HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment</i>) in view of defining a detailed description of the project technical activities for route to certification.</p> <p>Applicants are requested to establish contact with EASA in view of defining EASA's contribution to the project. The proposal shall provide a description of the technical activities contributing to the certification activities in the project proposal with an estimate of the budget to cover EASA's services which should be indicated in the project total cost of the proposal.</p> <p>The applicants shall prepare a plan for maturing the certification aspects (using the CRL scale) in cooperation with its airworthiness office at proposal stage. The plan will include an overview of the approach and the various steps to achieve the CRL targets. The applicants shall indicate in the plan the articulation of EASA contribution between activities proposed in the project and the ones covered by agreements already in place between EASA and the consortium partner in charge of the certification aspects to achieve the CRL objectives.</p> <p>The involvement of EASA in the proposal as third party shall be complemented, where applicable, by other possible agreements already in place between EASA and the consortium partner in charge of the certification aspects and which is relevant for the project execution.</p> <p>The contribution of EASA shall take the form of in-kind contribution under Article 9 of the Horizon Europe model Grant Agreement to be agreed under the proposal and to be implemented in the form of a service contract to be signed with EASA.</p> <p>The service contract template shall be established based on the CAJU model service contract published under the F&T Portal.</p> <p>With regard to the status and role of EASA in CAJU projects, see also the Amended Work Programme and Budget 2026-2027.</p> <p>Further guidance on EASA involvement and legal status in the proposal will be provided in the Q&A of the call.</p> <p>Practical modalities for contacting EASA will be laid down in the Q&A of the call.</p>
--	---

Expected Outcome:

Projects results are expected deliver and demonstrate a high pressure pump-fed hydrogen distribution system at TRL4 for the hydrogen combustion engine, enabling the demonstration of the direct hydrogen combustion propulsion aircraft concept addressed by the Clean Aviation SRIA.

Projects are expected to achieve the following outcomes:

- Deliver and demonstrate an optimized high-pressure liquid hydrogen distribution and conditioning system at TRL4, demonstrating the system capability to deliver the hydrogen fuel to the direct hydrogen combustion engine at the required conditions.
- Demonstrate the engine thrust control function at TRL4, including engine to liquid hydrogen distribution system coupling, thrust control and operability.
- Deliver and demonstrate the hydrogen distribution and conditioning system critical components at TRL5, compatible with the system architecture requirements and demonstrating the components performance and capability to meet the full spectrum operational requirements.
- Demonstrate the hydrogen distribution system critical components manufacturing, assembly and maintenance processes, demonstrating production-representative maturity for the components design selected.
- Develop and demonstrate a holistic hydrogen leakage management strategy compatible with the envisaged product safety requirements.
- Achieve a Certification Readiness Level 4 (CRL) for critical technologies and identify a route to contribute to achieving CRL6 at aircraft level.

The project results are expected to directly contribute to the performance targets of the direct hydrogen combustion propulsion aircraft concepts:

- The high-pressure hydrogen distribution and conditioning system shall contribute to demonstrating the viability of the direct hydrogen combustion propulsion aircraft concept, including the assessment of the energy efficiency at aircraft level compared to an equivalent Kerosene 2020 State-of-the-Art aircraft available in service.
- Adequate KPIs at integrated system and key technology levels shall be defined, to support the effective achievement of the expected outcomes, and shall be aligned with the performance targets defined in the section below.

A clear route towards certification, exploitation, and industrialization shall be identified, including the identification of operational requirements to subsequently support successful entry into service.

Scope:

The configurations of the Hydrogen Powered Aircraft concepts addressed in Clean Aviation are expected to remain a tube and wing. Such aircraft concepts are based on either a direct hydrogen combustion propulsion or a fully-electric hydrogen fuel cell propulsion, with a target Entry into Service in the 2040s. This topic focuses on the aircraft concept based on direct hydrogen combustion propulsion, which is expected to have a capacity between 120 and 150 passengers and a minimum design range of 1400 nautical miles.

The use of hydrogen in an aircraft will require substantial design changes compared to the aircraft concepts based on traditional hydrocarbon fuels. In this context, a main driver to demonstrate the viability of the direct hydrogen combustion aircraft will be the development and integration of a safe and reliable liquid hydrogen distribution system, capable of delivering and conditioning hydrogen, stored at the aircraft fuselage rear section, to the engine expected to be located under the aircraft wings. This is expected to be particularly challenging for the hydrogen combustion engine applications, supply of hydrogen to the engine will require additional pressurization, to satisfy the higher-pressure injection engine requirement. The control of the hydrogen supply temperature to the combustor will be a critical parameter expected to impact the engine operability and emissions characteristics.

The project aims to develop and demonstrate the fuel system architecture, with a focus on the high-

pressure hydrogen distribution system and components, enabling the supply of a hydrogen combustion engine with 150kN of thrust (per engine, for a two-engine aircraft configuration) capable to power the Clean Aviation direct hydrogen combustion propulsion aircraft concept addressed in the SRIA.

The project scope shall include the design and demonstration of a high-pressure pump-fed hydrogen fuel distribution system on ground, including the demonstration of the coupling with the engine.

This shall address the following:

- Optimization of the overall system mass and performance, including the impact of the distribution architecture on the hydrogen tank. The development of a hydrogen storage vessel (tank) is not in scope of this project but should be considered as part of the optimisation studies.
- On ground demonstration of the functional integration of the high pressure hydrogen distribution system, from the liquid hydrogen tank interface and up to engine combustion chamber interface¹¹⁸.
- Deliver a hydrogen distribution integration concept capable of meeting the expected hydrogen safety requirements, demonstrating the system capability to safely manage hydrogen leakages and the associated hydrogen safety risks.
- Deliver a comprehensive safety and reliability analysis to demonstrate compliance with aircraft and system requirements.
- Develop and demonstrate on ground the coupling of the engine to the liquid hydrogen fuel system, including the demonstration of the engine thrust control system capability to meet the engine and the aircraft certification and performance requirements.

The project scope should also include the development demonstration of the fuel distribution system critical components, optimized in conjunction with the distribution system architecture, This should address:

- A high pressure hydrogen pump(s), capable of delivering the pressure required by the direct hydrogen combustion engine, as specify in the performance target section.
- A hydrogen vaporization and conditioning heat exchanger, required to supply the hydrogen at the required temperature. Optimisation of the heat exchanger to re-use waste heat produced by the hydrogen combustion engine should be considered.
- Complete distribution system components from LH2 tank interface to the consumer interface, including Pipes, valves, sensors, vents, regulators, filters and any other required equipment.

The demonstration strategy combining physical demonstrators testing and complementary modelling should be elaborated by applicants to demonstrate a TRL5 achievement at component level and a TRL4 at integrated system level, compatibly with an EIS in the 2040s. The demonstration activities shall include:

- Ground testing of critical components in relevant environment to demonstrate compliance with aeronautical representative environmental conditions (e.g. vibration, shock) and operational conditions (e.g. dynamic loads, thermal and mechanical cycling)
- Virtual integration and hardware-in-the-loop simulations,
- Modelling and the multi-physics simulations (fluid, thermal, mechanical) capable of modelling transient behaviour, including 2-phase fluid operations.

¹¹⁸ The combustion chamber interface is defined as the point where the H2 is provided at the flow and temperature conditions defined in the topic performance section

- On ground cryogenic testing of the distribution system with representative scales and test conditions.
- Demonstration of thrust control by coupling of a sub-scale engine to a liquid hydrogen distribution system.
- Any complementary test to demonstrate the hydrogen leakage management system capability to detect, isolate and mitigate a hydrogen leakage in a representative fuel system installation environment.

The demonstrating strategy combining physical testing of a sub-scale engine and liquid hydrogen distribution system, intended to demonstrate the thrust control function at TRL4, should be elaborated by implementing synergies with projects HYDEA (GA n. 101102019) and CAVENDISH (GA n. 101102000).

The definition of the hydrogen combustion distribution system architecture to demonstrate the high pressure hydrogen distribution system at TRL4, should be established in close cooperation with the project selected from the topic “HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-03 Demonstration of an advanced Low NOx H2C Propulsion System for the direct hydrogen combustion aircraft concept”.

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity) and emphasize how they address the integration aspects.

With regards to certification, EASA Certification Readiness Level (CRL) framework shall be used to demonstrate a clear certification path. It is expected the hydrogen distribution system for a direct hydrogen propulsion aircraft will achieve CRL4. A roadmap to support a CRL6 at aircraft level should be defined by the end of the project.

The project is required to exploit the involvement and expertise of EASA in the proposal to de-risk and secure the certification of novel fuel system technologies with the aim to assess and define how the envisaged solutions will have the potential for certification (ref. topic conditions related to “Involvement of EASA”).

The project shall identify and implement synergies with activities funded under research and innovation programmes at regional¹¹⁹, national¹²⁰ and European¹²¹ level, and demonstrate how the project will benefit from these activities by detailing the specific contributions to the expected outcomes.

Performance Targets:

A set of top-level goals for the direct hydrogen combustion propulsion aircraft concept will be the basis for the fuel system performance targets, in particular:

- Demonstrate a hydrogen supply mass flow around 0.5 Kg/s in peak condition and around 0.35 Kg/s in nominal cruise condition
- Demonstrate a sub-system weight in the range of 1-2 tons, for the sub-systems developed under this topic as defined in the scope section. The sub-systems contribution to achieving the overall fuel system weight target, should be justified as part of the proposal
- Demonstrate a high pressure pump outlet pressure no less than 70 bars.

¹¹⁹ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

¹²⁰ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF) and the European recovery fund (i.e. NextGenerationEU).

¹²¹ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2022-2023) and/or other EU programmes.

- Demonstrate a hydrogen supply temperature to the combustor supporting the engine operability requirements.
- A system mean time between failures (MTBF¹²²) no less than 3000 flight hours
- An engine thrust response time from idle to 95% of the rated take-off thrust in no more than 5 seconds (Compliance with CS-E 745 Engine Acceleration)

The top-level goals should be broken down in a consistent manner at the different levels: from top-level aircraft requirements down to systems, sub-systems, and components level requirements. Pertinent performance targets including Key Performance Indicators (KPIs) shall be derived for each, including relevant weight, aerodynamics and performance targets.

In particular, the applicants shall clearly document the expected performance targets and demonstrate at project completion their achievement covering:

- Definition of hydrogen distribution installation performance targets aligned with the aircraft level targets, such as the weight breakdown, energy consumption and installed drag shall be provided.
- Compliance with the hydrogen leakage management system safety objectives.
- System durability, reliability and maintainability consistent with targeted service life.
- Evaluation, monitoring and reporting of hydrogen fugitive and operational leakages.

The precise KPIs and targets for the propulsion system should be established in cooperation with the aircraft integrator (Topic *HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01Hydrogen Powered Aircraft concept and key technologies integration and impact assessment*) to ensure the alignment with aircraft-level requirements.

The exchanges and delivery of models and data should be adequately planned to support the performance, emissions and life-cycle assessment of the direct hydrogen combustion propulsion aircraft concept.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹²³ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposals shall include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology.

A robust assessment of uncertainties and risks on achievement of performance targets for all critical technologies, sub-system and system level and their integration effects should be included in the proposal along with potential mitigation actions.

122 Defined as the number of flight hours with a maximum of one aircraft-on-ground event (AOG) because of a failure in the entire onboard fuel storage, supply and conditioning system

¹²³ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

FAST-TRACK ACTIVITIES TOPICS (FTA)

HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-01: Demonstration of low power Ice Protection System technology

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Indicative budget	<p>The total indicative funding budget for the topic is EUR 5 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Expected EU contribution per project	The Clean Aviation Joint Undertaking estimates that an EU contribution up to EUR 5 million would allow these outcomes to be addressed appropriately.
Special eligibility condition – limitation of the types of legal entities eligible to coordinate the project	<p>The coordinator role shall be limited to legal entities having the following type of organisation:</p> <ul style="list-style-type: none"> • University, • Research and Technology Organisation (RTO) or • SME (legal entities are advised to confirm their SME status¹²⁴).
Indicative project duration	Maximum 24 months.
Type of Action	Research and Innovation Actions.
Technology Readiness Level	<p>A minimum TRL4 shall be justified at project start for the contributing technologies.</p> <p>Activities are expected to achieve TRL 5 at system level at project completion, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft with an entry into service by 2035.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>

¹²⁴ Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422).

For more information, please follow this link:

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia led by an SME, RTO or University with a proven track record in developing and delivering globally competitive research and innovation to aircraft programmes.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Industrial entities (except SMEs) are expected to join the consortium as Associated Partners with zero requested EU funding. Any form of participation in the proposal by industrial entities (except SMEs) and related funding allocation should be duly justified in relation to the objectives of the proposal and in terms of proposed European industrial exploitation, and should be limited to 10% in terms of funding allocation.</p>
Consortium Agreement	Participants in the project(s) selected under this topic must conclude with the participants to the project, a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.
Additional topic condition – special role in the project as “end-user” with possible participation as Associated Partner	<p>The proposals submitted under this topic are required to demonstrate the expected contribution to the aircraft concepts roadmap as specified in the Amended Work Programme and Budget 2026-2027 and, if any, other possible alternative industrial exploitation routes.</p> <p>The industrial “end-user” of the project shall be capable to integrate and mature the Ultra-Efficient Regional Aircraft concept as addressed and described in the CAJU Amended Work Programme and Budget 2026-2027 and Clean Aviation SRIA. It shall be a European based aircraft manufacturer/integrator possessing a track record of design, development, manufacturing and certification. The entity shall be identified as preferred end-user in the proposal, together with a description of its envisaged exploitation contribution.</p> <p>A letter of support from the preferred end-user(s) is not required at proposal submission. However, following the evaluation and potential selection, the preferred end-user(s) shall confirm their interest and role in relation to the project's results prior to the grant agreement signature.</p> <p>End-users are expected to formalise their involvement through the Consortium Agreement, to be signed after the Grant Agreement signature, and by joining the consortium as an Associated Partner¹²⁵, with</p>

¹²⁵ For guidance on Article 9.1 Associated partners please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

	<p>zero requested EU funding.</p> <p>Other potential end-user(s) may be listed as well, also during the implementation of the project in line with other possible industrial exploitation routes.</p>
End-user's role	<p>The applicant must indicate the expected role of the end-users in the proposal and how the end-user should contribute to the activity through one or more of the following areas in line with Horizon Europe:</p> <ul style="list-style-type: none"> • Analysing data for the project • Monitoring and/or evaluating R&I results • Testing & experimenting with innovative R&I solutions • Debating R&I findings and implications for them • Others (to be specified by the applicant).
Project Monitoring	<p>The JU will perform a gate review no later than month 11 to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>

Expected Outcome:

Project results are expected to **demonstrate low power Ice Protection System (IPS) technology** for Clean Aviation's an Ultra-Efficient Regional Aircraft (UERA) concept considered for Entry into Service by 2035.

The project is expected to achieve the following outcomes:

- Develop and demonstrate innovative low-power IPS technology suitable for the ice protection of the wing and empennage leading edges. The technology shall address icing conditions relevant to the UERA concept, covering Appendix C and Appendix O of the EASA CS-25.
- Deliver a lightweight, low drag and low power solution compatible with UERA concept integration. The delivered solution shall contribute to airframe performance and emissions reductions, and shall be compatible with non-propulsive power levels, reducing power consumption compared to conventional thermal systems.
- TRL5 shall be achieved based on stepwise Ground Test Demonstrations at technology level and system level.
- A clear roadmap (including safety and certification aspects, aircraft level integration and demonstration, maintenance and in-service operations) shall be identified towards TRL6 demonstration by 2030, to support the potential exploitation on the UERA concept.

The project shall consider cooperation and alignment with the project HERACLES (GA n° 101256949), responsible for the aircraft integration of the UERA concept, as use-case for this fast-track activity.

Scope:

Ice Protection Systems are a key enabler for the UERA concept proposed in Clean Aviation SRIA, which is a hybrid-electric turbo-propeller concept of more than 50 pax, aiming at 30% CO₂ emissions reduction at aircraft level, compared to 2020 State-of-the-Art aircraft, and with aircraft EIS expected by 2035. This aircraft concept, expected to remain tube and wing, is powered by an innovative wing-mounted powerplant with hybrid-electric capability based on batteries. The airframe will include advanced wing and empennage designs for low weight and low drag, based on technologies such as advanced materials, laminar aerodynamics or advanced flight controls.

The present topic aims to develop and mature IPS technology compatible with this UERA architecture, enabling to replace the pneumatic boots systems typically used on current regional aircraft. This is expected to improve aerodynamic performance by reducing surface deformation and roughness, and as well to improve system reliability and maintenance by removing the deformable materials with limited life duration.

The project scope is expected to cover the following areas:

- The **design and validation of an innovative IPS architecture** suitable for the wing and empennage ice-protection. Electrical or hybrid solutions should be considered, based on adequate combination of active and/or passive ice-protection strategies by means of mechanical and/or thermal technologies, in order to provide de-icing and anti-icing functionalities as needed from end-user requirements and CS-25 Appendix C and Appendix O icing conditions applicable to UERA.
- **Optimization and integration the IPS on UERA concept**, for optimal efficiency addressing weight, aerodynamics (surface quality, residual ice), energy and power consumption performance, supported by adequate modelling activities. The power consumption should be compatible with power offtakes from UERA turbo-propeller engine cores, and the system installation should be compatible with UERA wing and empennage integration constraints specified by the end-user (e.g. aerodynamic surface quality, volume and mechanical requirements, systems interfacing). The system robustness (e.g. electromagnetic interferences), reliability, and durability shall be compatible with the UERA operating conditions.
- The **activation and control logics** of IPS, considering the potential integration of ice-detection sensors to ensure the correct identification of the icing conditions and monitoring the IPS effectiveness for optimal activation logics. Focus shall be placed upon solutions able to discern severe icing conditions, as well as on minimizing the changes in aerodynamics and aircraft flight characteristics.

The ground demonstration activities shall cover testing at representative scale and environment conditions of the UERA concept, **to achieve a TRL5 at system level:**

- Experimental testing (e.g. Icing Wing Tunnel testing), should cover a wide range of representative icing conditions representative of the UERA flight envelope and CS-25 Appendix C and Appendix O.
- The demonstrator shall use a test article representative of a Regional Aircraft wing leading edge component at full-scale, as critical ice-protection surface for demonstration.
- The demonstration should include the activation and control logics, and associated ice detection system where relevant.

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity).

Extensive research on ice-protection systems has been previously performed, covering a wide range of technologies (such as thermo-electrical, piezo-electric, induction, electro-expulsive, or passive coatings) and various applications cases. The applicants should show how the proposed project builds on this research and justify how the proposed solutions and demonstrations will go beyond the state-of-the-art and be tailored to the UERA proposed use-case for EIS by 2035.

Cooperation with the industrial end-user(s) regarding performance and integration requirements, adequacy of icing conditions for demonstration, physical and data interfaces with aircraft and systems, will be established at project start.

The contribution of the topic to the certification aspects will be handled by the industrial end-user(s) of the project, with the support of the consortium members. Any deviation or exclusion against CS-25 Appendix C and O icing conditions should be clearly justified. Close cooperation with the project to be selected from topic HORIZON-JU-CLEAN-AVIATION-2026-04-TRA-01 *Demonstration and Validation of icing Certification Methodologies enabling EIS2035 for the SMR and REG Aircraft* is highly recommended.

The project shall identify potential synergies with the related activities funded under research and innovation programmes at regional¹²⁶, national¹²⁷ and European¹²⁸ level, and demonstrate how the project will benefit from these activities.

Performance Targets:

The performance targets of the IPS technologies shall address **energy consumption and contribution to the airframe weight and aerodynamic performance**, in order to support the CO2 emissions reduction objectives of the UERA Aircraft concept.

The following objectives shall be pursued, in comparison to 2020 State-of-the-Art regional turbo-propeller aircraft of more than 50 pax using pneumatic boots IPS technology:

- An energy consumption in a maximum range of 0.1 to 0.3 kW/m (power per meter of protected wingspan), supporting reduced engine offtakes (bleed air and/or electrical generator power) and enabling improved engine efficiency.
- Smart operation based on ice detection sensors and real-time IPS efficiency monitoring
- Reduced IPS maintenance due to simpler architecture
- No decrease of aerodynamic performance compared to a wing without IPS.
- Ambitious weight targets shall be proposed and justified by the applicants in cooperation with the end-user, according to the proposed technology and state-of-the-art.
- Volume and integration requirements to be established with the end-user at project start, to ensure compatibility with the UERA concept.

These top-level goals should be broken down and complemented in a consistent manner at the different levels: from top-level aircraft requirements to IPS system, sub-systems and components level requirements, from where pertinent performance targets including Key Performance Indicators (KPIs) should be derived.

¹²⁶ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹²⁷ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹²⁸ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹²⁹ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposal should include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology, associated risks and planned mitigation actions.

¹²⁹ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-02: Demonstration of cabin acoustic optimisation technology

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Indicative budget	<p>The total indicative funding budget for the topic is EUR 5 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Expected EU contribution per project	The Clean Aviation Joint Undertaking estimates that an EU contribution up to EUR 5 million would allow these outcomes to be addressed appropriately.
Special eligibility condition – limitation of the types of legal entities eligible to coordinate the project	<p>The coordinator role shall be limited to legal entities having the following type of organisation:</p> <ul style="list-style-type: none"> • University, • Research and Technology Organisation (RTO) or • SME (legal entities are advised to confirm their SME status¹³⁰).
Indicative project duration	Maximum 24 months.
Type of Action	Research and Innovation Actions.
Technology Readiness Level	<p>A minimum TRL3 shall be justified at project start for the contributing technologies.</p> <p>Activities are expected to achieve TRL 5 at technology level and airframe component integration level at project completion, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft with an entry into service by 2035.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Special skills and/or capabilities expected from the Applicant(s)	The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia led by an SME, RTO or University with a proven track record in developing and delivering globally competitive research and innovation to aircraft programmes.

¹³⁰ Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422).

For more information, please follow this link:

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Industrial entities (except SMEs) are expected to join the consortium as Associated Partners with zero requested EU funding. Any form of participation in the proposal by industrial entities (except SMEs) and related funding allocation should be duly justified in relation to the objectives of the proposal and in terms of proposed European industrial exploitation, and should be limited to 10% in terms of funding allocation.</p>
Consortium Agreement	Participants in the project(s) selected under this topic must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.
Additional topic condition – special role in the project as “end-user” with possible participation as Associated Partner	<p>The proposals submitted under this topic are required to demonstrate the expected contribution to the aircraft concepts roadmap as specified in the Amended Work Programme and Budget 2026-2027 and, if any, other possible alternative industrial exploitation routes.</p> <p>The industrial “end-user” of the project shall be capable to integrate and mature the Ultra-Efficient Regional Aircraft concept as addressed and described in the CAJU Amended Work Programme and Budget 2026-2027 and Clean Aviation SRIA. It shall be a European based aircraft manufacturer/integrator possessing a track record of design, development, manufacturing and certification. The entity shall be identified as preferred end-user in the proposal, together with a description of its envisaged exploitation contribution.</p> <p>A letter of support from the preferred end-user(s) is not required at proposal submission. However, following the evaluation and potential selection, the preferred end-user(s) shall confirm their interest and role in relation to the project's results prior to the grant agreement signature.</p> <p>End-users are expected to formalise their involvement through the Consortium Agreement, to be signed after the Grant Agreement signature, and by joining the consortium as an Associated Partner¹³¹, with zero requested EU funding.</p> <p>Other potential end-user(s) may be listed as well, also during the implementation of the project in line with other possible industrial exploitation routes.</p>

¹³¹ For guidance on Article 9.1 Associated partners please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

End-user's role	<p>The applicant must indicate the expected role of the end-users in the proposal and how the end-user should contribute to the activity through one or more of the following areas in line with Horizon Europe:</p> <ul style="list-style-type: none"> • Analysing data for the project • Monitoring and/or evaluating R&I results • Testing & experimenting with innovative R&I solutions • Debating R&I findings and implications for them • Others (to be specified by the applicant).
Project Monitoring	<p>The JU will perform a gate review no later than month 11 to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>

Expected Outcome:

Project results are expected to **demonstrate cabin acoustic optimisation technologies** primarily for Clean Aviation's Ultra-Efficient Regional Aircraft (UERA) concept considered for Entry into Service by 2035.

The project is expected to achieve the following outcomes:

- Develop and demonstrate innovative acoustic treatment technologies contributing to cabin noise mitigation.
- Deliver lightweight and low volume acoustic treatment solutions compatible with the UERA concept in terms of airframe integration as well as noise and vibration environment, based on end-user guidance. The delivered solutions shall contribute to the airframe performance and emissions reductions, while supporting passenger comfort by considering actual passenger perception of the cabin noise environment.
- TRL5 shall be achieved based on stepwise Ground Test Demonstrations at technology level and airframe component integration level.
- A clear roadmap (including safety and certification aspects, aircraft level integration and demonstration, maintenance and in-service operations) shall be identified towards TRL6 demonstration by 2030, to support the potential exploitation on the UERA concept.
- The acoustic treatment technologies shall consider CS-25 requirements and environmental conditions suitable for application on the UERA concept.
- Applicants should consider synergies and spill-over effects of technologies for application for cabin acoustic treatment of Short & Medium Range (SMR) aircraft powered by unducted or ducted Turbo-Fan engines.

The project shall consider cooperation and alignment with the project HERACLES (GA n° 101256949), responsible for the aircraft integration of the UERA concept, as a primary use-case for this fast-track activity. If synergetic technologies for SMR concept acoustic treatment are identified, cooperation with AClandI project (GA n° 101255025), responsible for the integration of the Ultra-Efficient SMR aircraft concept, should be considered as well.

Scope:

The cabin acoustic treatment is an essential enabler for the ultra-efficient aircraft concepts proposed in Clean Aviation SRIA, aiming at 30% CO₂ emissions reduction at aircraft level, compared to 2020 State-of-the-Art aircraft, and with aircraft EIS expected by 2035.

For the UERA concept, which is a hybrid-electric turbo-propeller concept of more than 50 pax, the presence of large propellers in direct vicinity of the fuselage creates cabin noise levels affecting passenger comfort and acceptance.

Similarly, SMR aircraft concepts based on unducted turbo-fan engines or larger ducted turbo-fan engines, are expected to face acoustic challenges.

The present topic aims to develop and mature such cabin acoustic treatment technologies for CS-25 aircraft, and study design solutions for integration on the UERA concept.

The project scope is expected to cover the following areas:

- The **design and validation of lightweight acoustic and vibration treatment technologies**:
 - Selection and development of innovative technologies such as advanced materials or meta-materials with tailored properties. Passive or active attenuation strategies should be considered.
 - Modelling and simulation of vibroacoustic behaviour, from material to cabin level.
 - Prototyping and experimental testing for data collection and model refinement, covering acoustic performance, structural performance, fire and humidity resistance, and other relevant testing.
- The **airframe integration of selected acoustic treatment technologies**, compatible with the UERA use-case:
 - Definition of an acoustic treatment concept, considering the aircraft structural layout and environment specified by the end-user covering the vibration and noise sources.
 - Modelling of the acoustic behaviour of a fuselage & cabin integrating the selected technologies, addressing weight and acoustic performance optimization.
 - Evaluation and optimization of acoustic treatment for UERA flight conditions, including trade-offs between weight and acoustic performance and recommendations of relevant structural layouts.
- **Human-centric design and immersive evaluation of human perception**:
 - Integration of the human dimension in the acoustic design loop, considering passenger comfort and perceived acoustic quality metrics.
 - Human-centered evaluation of acoustic performance, based on modelling and jury-based listening test activities.

The ground demonstration activities shall cover the testing at representative scale and environment conditions of the UERA concept, **to achieve a TRL5 at component level**:

- Experimental testing and characterisation from technology level (such as material samples or system testing) to integrated airframe component level (such as fuselage/cabin insulated panels), addressing acoustic, structural, fire, humidity and other relevant performance assessments.
- Immersive acoustic testing addressing human perception (e.g. jury-tests).

- Modelling and simulation of the overall effect at fuselage/cabin level, calibrated from test campaigns results, and compatible with an UERA application.

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity).

Cooperation with the industrial end-user(s) regarding UERA noise and vibration sources, performance and integration requirements, physical and data interfaces with aircraft and systems, will be established at project start. Further cooperation with industrial end-user(s) is welcome to identify synergies and applicability of the acoustic treatment technologies to SMR aircraft concepts.

The contribution of the topic to the certification aspects will be handled by the industrial end-user(s) of the project and, where appropriate, with the support of the consortium members.

The project shall identify potential synergies with the related activities funded under research and innovation programmes at regional¹³², national¹³³ and European¹³⁴ level, and demonstrate how the project will benefit from these activities.

Performance Targets:

The performance targets of the acoustic treatment technologies shall address both **acoustic and weight/volume performance**, to support the CO2 emissions reduction objectives and market-acceptance of the UERA concept.

The following objectives shall be pursued, in comparison to 2020 State-of-the-Art regional turbo-propeller aircraft of more than 50 pax:

- **A cabin noise reduction of at least -5dB(A).**
- **Annoyance reduction of at least 25%** (subjective rating based on jury-test scores)
- **Weight reduction of at least 10%** for the acoustic treatments at fuselage/cabin level
- **Volume and integration** requirements to be established with the end-user at project start, to ensure compatibility with the UERA concept.

These top-level goals should be broken down and complemented in a consistent manner at the different levels: from top-level aircraft requirements to acoustic treatment technology requirements, from where pertinent performance targets including Key Performance Indicators (KPIs) should be derived.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹³⁵ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

¹³² activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹³³ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹³⁴ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

¹³⁵ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

Proposal should include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology, associated risks and planned mitigation actions.

HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-03 Advanced noise-reducing technologies for propulsion systems of next generation Ultra-efficient SMR aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Indicative budget	<p>The total indicative funding budget for the topic is EUR 5 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Expected EU contribution per project	The Clean Aviation Joint Undertaking estimates that an EU contribution up to EUR 5 million would allow these outcomes to be addressed appropriately.
Special eligibility condition – limitation of the types of legal entities eligible to coordinate the project	<p>The coordinator role shall be limited to legal entities having the following type of organisation:</p> <ul style="list-style-type: none"> • University, • Research and Technology Organisation (RTO) or • SME (legal entities are advised to confirm their SME status¹³⁶).
Indicative project duration	Maximum 24 months.
Type of Action	Research and Innovation Actions.
Technology Readiness Level	<p>A minimum TRL4 shall be justified at project start for the considered technologies.</p> <p>Activities are expected to achieve TRL 5 at system level at project completion, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft with an entry into service by 2035.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Special skills and/or capabilities expected from the Applicant(s)	The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia led by an SME, RTO or University with a proven track record in developing and delivering globally competitive research and innovation to aircraft programmes.

¹³⁶ Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422).

For more information, please follow this link:

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Industrial entities (except SMEs) are expected to join the consortium as Associated Partners with zero requested EU funding. Any form of participation in the proposal by industrial entities (except SMEs) and related funding allocation should be duly justified in relation to the objectives of the proposal and in terms of proposed European industrial exploitation, and should be limited to 10% in terms of funding allocation.</p>
Consortium Agreement	Participants in the project(s) selected under this topic must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.
Additional topic condition – special role in the project as “end-user” with possible participation as Associated Partner	<p>The proposals submitted under this topic are required to demonstrate the expected contribution to the aircraft concepts roadmap as specified in the Amended Work Programme and Budget 2026-2027 and, if any, other possible alternative industrial exploitation routes.</p> <p>The industrial “end-user” of the project shall be capable to integrate and mature the Ultra-Efficient SMR engine or aircraft concept as addressed and described in the CAJU Amended Work Programme and Budget 2026-2027 and Clean Aviation SRIA. It shall be a European based aircraft manufacturer/integrator possessing a track record of design, development, manufacturing and certification. The entity shall be identified as preferred end-user in the proposal, together with a description of its envisaged exploitation contribution.</p> <p>A letter of support from the preferred end-user(s) is not required at proposal submission. However, following the evaluation and potential selection, the preferred end-user(s) shall confirm their interest and role in relation to the project's results prior to the grant agreement signature.</p> <p>End-users are expected to formalise their involvement through the Consortium Agreement, to be signed after the Grant Agreement signature, and by joining the consortium as an Associated Partner¹³⁷, with zero requested EU funding.</p> <p>Other potential end-user(s) may be listed as well, also during the implementation of the project in line with other possible industrial exploitation routes.</p>
End-user's role	The applicant must indicate the expected role of the end-users in the

¹³⁷ For guidance on Article 9.1 Associated partners please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

	<p>proposal and how the end-user should contribute to the activity through one or more of the following areas in line with Horizon Europe:</p> <ul style="list-style-type: none"> • Analysing data for the project • Monitoring and/or evaluating R&I results • Testing & experimenting with innovative R&I solutions • Debating R&I findings and implications for them • Others (to be specified by the applicant).
Project Monitoring	<p>The JU will perform a gate review no later than month 11 to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>

Expected Outcome:

Project results are expected to **define, develop and demonstrate advanced noise-reducing technologies and methodologies** for the Ultra-High-Bypass Ratio ducted turbofan designed for integration on to Clean Aviation's Ultra-Efficient Short and Medium-range (SMR) aircraft concept with Entry into Service (EIS) by 2035. The disruptive propulsion system shall be integrated into the aircraft, together with compact nacelle-pylon configurations and advanced pitch-control architectures, to contribute to reduction in specific fuel consumption and CO₂ emissions. The disruptive architecture, however, introduces higher noise which could be optimized with advanced noise-reducing technologies to be developed within this topic with TRL4 maturity justified at the start.

Projects are expected to deliver the following outcomes:

- Define, develop and demonstrate the noise reduction potential of proposed noise reducing and lightweight key technologies for UHBR fan with short inlet engine architecture at TRL5. The noise reducing and lightweight key technologies shall enable shorter intake and fan systems, as well as cumulative noise reductions and lower mass compared to current generation turbofans in service.
- Deliver validated aero-acoustic models capable of advanced prediction of noise sources and relevant source-identification techniques against representative test data to achieve TRL5.
- Deliver a clear roadmap towards TRL6 demonstration addressing safety and certification for potential exploitation of the proposed noise-reducing technologies on the UHBR engine architecture.

The project shall consider cooperation and alignment with the Clean Aviation Ultra-Efficient SMR aircraft concept addressed by project AClandI (GA n. 101255025).

Scope:

Next-generation low-emission propulsion systems for the future SMR aircraft considered for entry into service (EIS) by 2035 are expected to play a central role in achieving a 30% CO₂ emissions reduction at aircraft level, compared to 2020 state-of-the-art technologies. The engine concepts featuring a UHBR fan architecture introduces a significantly shorter intake geometries, reducing both drag and structural mass for improved performance. These characteristic shorter intakes cause unfavorable flow conditions leading to increased fan noise.

To address these challenges, the present topic aims to mature aero-acoustic modelling and measurement methods, as well as noise-reducing and lightweight technologies for the UHBR propulsion system up to TRL5 by project completion.

Applicants should demonstrate TRL4 at project start for proposed technologies and methods to be pursued. This should be based on synergies with activities from CA projects HEAVEN (GA n. 101102004), UNIFIED (GA n. 101256789), Clean Sky 2 or funded by national/regional or other European programmes.

The project scope should include the following:

- Identification and demonstration of advanced noise-reducing technologies to mitigate inflow distortions in short intakes for maturation to TRL5, based on design features that suppress flow separation and manage fan-driven intake diffusion.
- Maturation and validation to TRL5 of distortion-tolerant fan systems, resulting in mitigation of the impact of distorted inflow on fan system behaviour, such as - but not limited to - high axial Mach number configurations, variable-pitch fan systems, aeroelastic damped blade structures.
- Identification and demonstration of key lightweight structural solutions with noise-abating features for maturation to TRL5, with consideration of areas such as the impact of structural excitation, robustness, and fatigue life under UHBR-specific inflow conditions.
- Aero-acoustic assessment and demonstration of noise-reduction potential of integrated low-noise and lightweight technologies on a relevant UHBR platform by means of representative rig tests in relevant flow, acoustic and operational conditions. The UHBR platform shall be selected taking into account noise-reducing features, such as distortion-tolerant designs, tip vortex suppression, and aero-acoustic damping.
- Development and maturation of aero-acoustic models to accurately predict the noise-sources against existing test results, and establish relevant improvements to noise measurement methodologies during tests on ground or in-flight
- Computation and validation of noise-source reduction potential of the selected key technologies as compared to the State of the Art in UHBR engine architectures.

The demonstration activities should cover the testing at representative scale and environment conditions of the Ultra-efficient SMR aircraft concept critical flight envelope for flow distortion at the inlet of the UHBR, in order to achieve TRL5 at key technologies and model validation, including:

- Wind Tunnel Testing (WTT) under variable inflow conditions relevant to the aircraft operating conditions) to demonstrate the aero-acoustic behaviour and performance of the proposed technology
- Structural testing for relevant components and sub-components with the relevant load cases and interfaces representative of the UHBR operating conditions.
- Model validation based on test data from representative ground or flight tests on the UHBR

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity).

Cooperation with the end-user (e.g. regarding performance and integration requirements, physical and data interfaces with aircraft and systems) should be established at project start.

The project shall identify potential synergies with the related activities funded under research and

innovation programmes at regional¹³⁸, national¹³⁹ and European¹⁴⁰ level, and demonstrate how the project will benefit from these activities.

Performance Targets:

The performance targets of the key low-noise and lightweight technologies shall address the acoustic and weight performance of the integrated demonstrations of such technology at the engine architecture level.

A number of top-level goals for the key technologies will be the basis for performance targets, in particular:

- Significantly improved aero-acoustic assessment and the source identification and attribution of noise sources to the responsible engine components, with respect to current State of the Art models.
- 3-5 EPNdB cumulative noise reduction with respect to current-generation turbofans due to the noise-reducing and light weight technologies including acoustic liners, measured at noise source.
- Weight reduction of at least 10% due to the lightweight materials implementation compared to the State-of-the-Art structures of the selected key technologies.

These top-level goals should be broken down and complemented in a consistent manner at the different levels: from top-level aircraft requirements to sub-systems and components level requirements, from where pertinent performance targets including Key Performance Indicators (KPIs) should be derived.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹⁰⁵ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposals should include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology associated risks and planned mitigation actions at technology level.

¹³⁸ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹³⁹ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹⁴⁰ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Indicative budget	<p>The total indicative funding budget for the topic is EUR 5 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Expected EU contribution per project	The Clean Aviation Joint Undertaking estimates that an EU contribution up to EUR 5 million would allow these outcomes to be addressed appropriately.
Special eligibility condition – limitation of the types of legal entities eligible to coordinate the project	<p>The coordinator role shall be limited to legal entities having the following type of organisation:</p> <ul style="list-style-type: none"> • University, • Research and Technology Organisation (RTO) or • SME (legal entities are advised to confirm their SME status¹⁴¹).
Indicative project duration	Maximum 24 months.
Type of Action	Research and Innovation Actions.
Technology Readiness Level	<p>A minimum TRL4 shall be justified at project start for the considered technologies.</p> <p>Activities are expected to achieve TRL 5 at sub-system level at project completion, as indicated in section ‘Expected Outcome’.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new aircraft with an entry into service by 2035.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia led by an SME, RTO or University with a proven track record in developing and delivering globally competitive research and innovation to aircraft programmes.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and</p>

¹⁴¹ Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422).

For more information, please follow this link:

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Industrial entities (except SMEs) are expected to join the consortium as Associated Partners with zero requested EU funding. Any form of participation in the proposal by industrial entities (except SMEs) and related funding allocation should be duly justified in relation to the objectives of the proposal and in terms of proposed European industrial exploitation, and should be limited to 10% in terms of funding allocation.</p>
Consortium Agreement	Participants in the project(s) selected under this topic must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.
Additional topic condition – special role in the project as “end-user” with possible participation as Associated Partner	<p>The proposals submitted under this topic are required to demonstrate the expected contribution to the aircraft concepts roadmap as specified in the Amended Work Programme and Budget 2026-2027 and, if any, other possible alternative industrial exploitation routes.</p> <p>The industrial “end-user” of the project shall be capable to integrate and mature the Ultra-Efficient SMR aircraft concept as addressed and described in the CAJU Amended Work Programme and Budget 2026-2027 and Clean Aviation SRIA. It shall be a European based aircraft manufacturer/integrator possessing a track record of design, development, manufacturing and certification. The entity shall be identified as preferred end-user in the proposal, together with a description of its envisaged exploitation contribution.</p> <p>A letter of support from the preferred end-user(s) is not required at proposal submission. However, following the evaluation and potential selection, the preferred end-user(s) shall confirm their interest and role in relation to the project's results prior to the grant agreement signature.</p> <p>End-users are expected to formalise their involvement through the Consortium Agreement, to be signed after the Grant Agreement signature, and by joining the consortium as an Associated Partner¹⁴², with zero requested EU funding.</p> <p>Other potential end-user(s) may be listed as well, also during the implementation of the project in line with other possible industrial exploitation routes.</p>
End-user's role	The applicant must indicate the expected role of the end-users in the proposal and how the end-user should contribute to the activity through

¹⁴² For guidance on Article 9.1 Associated partners please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

	<p>one or more of the following areas in line with Horizon Europe:</p> <ul style="list-style-type: none"> • Analysing data for the project • Monitoring and/or evaluating R&I results • Testing & experimenting with innovative R&I solutions • Debating R&I findings and implications for them • Others (to be specified by the applicant).
Project Monitoring	<p>The JU will perform a gate review no later than month 11 to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>

Expected Outcome:

Project results are expected to **demonstrate an airborne-ready lidar sensor concept at TRL5 compatible with a feed-forward Gust Load Alleviation (GLA) system** for Clean Aviation's Ultra-Efficient Short and Medium-range (SMR) aircraft concept with Entry into Service (EIS) by 2035.

The project is expected to achieve the following outcomes:

- Develop and demonstrate TRL5 maturity for key lidar sub-systems including their integration in constrained volumes.
- Deliver validated three-dimensional wind reconstruction algorithms capable of real-time operation and integration with aircraft flight control systems.
- Deliver a validated simulation and verification platform coupling wind measurements to gust load alleviation function to assess system level gains for optimized aircraft-lidar configurations.
- Deliver a robust plan for future industrialization including a hardware and function tree with system architecture.
- A consolidated roadmap shall be identified towards TRL6 demonstration including recommendations for flight test implementation and certification readiness to support its potential exploitation on the Ultra-Efficient SMR Aircraft concept with EIS by 2035.

The project should consider cooperation and alignment with the project AClandI (GA n. 101255025), responsible for the aircraft integration of the Clean Aviation Ultra-Efficient SMR aircraft concept.

Scope:

The maturation of lidar-based GLA is a key enabler for High Aspect Ratio (HAR) Wings envisaged for the Ultra-efficient SMR aircraft concept, offering the capability to remove gust load cases from wing-sizing criteria, enabling up to potential 20% reduction in wing root bending moments and corresponding weight savings as compared to the State of the Art (SoA). This will contribute directly to the expected 30% reduction in CO2 emissions at aircraft level for the Ultra-Efficient SMR aircraft concept compared to the SoA aircraft in service in 2020.

The project scope is to mature and demonstrate key technologies to TRL5 and supporting algorithms required for airborne lidar systems compatible with a feed-forward GLA at aircraft level, covering the

following areas:

- Identification and prioritization of key technologies to be matured for the Lidar system.
- Demonstration and qualification of all selected hardware components to TRL5 under representative operational conditions including vibrations, temperature gradients, pressure changes and electromagnetic compatibility at component level.
- Integration of key technologies at sub-system level to demonstrate a full lidar system in a representative test environment, to demonstrate measurement performance and compatibility with the GLA feed-forward control.
- Development of real-time signal processing for 3D wind reconstruction algorithms and demonstration of such algorithms to operate under relevant environmental conditions and capability to be integrated within aircraft flight control architectures.
- Validate the system performance by coupling the wind measurement to the system GLA functions based on simulations and verification for optimized lidar-aircraft configurations, with measurable load-reduction potential and operational benefits.
- Develop a credible plan for TRL6 demonstration, defining a stepwise roadmap towards industrial implementation, supported by a certification readiness plan consistent with CS-25 Appendix K.

The demonstration activities shall include:

- System functional and physical integration testing at system and sub-system level, with representative scale, interfaces, and conditions of the Ultra-Efficient SMR Aircraft concept.
- Controlled laboratory and relevant environmental tests for vibrations, temperature and pressure changes and electromagnetic compatibility
- Hardware-in-the-Loop and validation against representative test data from representative ground or flight tests

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity).

Cooperation with the end-user(s) regarding performance and integration requirements, physical and data interfaces with aircraft and systems shall be established at project start.

The contribution of the topic to the certification aspects will be handled by the industrial end-user(s) of the project and, where appropriate, with the support of the consortium members.

The project shall identify potential synergies with the related activities funded under research and innovation programmes at regional¹⁴³, national¹⁴⁴ and European¹⁴⁵ level, and demonstrate how the project will benefit from these activities.

Performance Targets:

The performance targets of the key technologies for the lidar system shall address typical measurable parameters such as power, stability, sensitivity and accuracy in order to enable a feed-

¹⁴³ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹⁴⁴ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹⁴⁵ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

forward GLA system on the next generation Ultra-efficient SMR aircraft. The GLA system will in turn allow potential load alleviation and subsequent weight reduction at aircraft level.

A number of top-level goals for the lidar sensor concept for feed-forward Gust Load Alleviation (GLA) systems will be the basis for performance targets, in particular:

- 20% reduction in the upper limit of turbulence-induced loads on wings, empennage and fuselage in flight
- Structural weight reduction due to GLA in comparison to other load control functions
- Recognition of gusts and turbulence ahead of the aircraft with acceptable precision within 50m of the aircraft nose
- Reliable detection of wind field trends up to 150m ahead of the aircraft
- Latency, accuracy and availability of the lidar sub-systems under representative environmental conditions
- Efficiency of the light emitter and signal to noise ratio of the detector
- Reliability, calibration stability and self-diagnostic capability consistent with continuous operation and readiness for transition to in-flight demonstration
- Robustness of wind estimation chain, ensuring accurate turbulence characterization across the relevant frequency spectrum

These top-level goals should be broken down and complemented in a consistent manner at the level of key technologies of the lidar sensor system. Pertinent performance targets including Key Performance Indicators (KPIs) should be derived for each technology covered in the project.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹⁰⁵ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values. They should be demonstrated on ground at component, sub-system, and integrated-system level to TRL5 by project end.

Proposals should include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology, associated risks and planned mitigation actions.

HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-05 Cryo-cooled power electronics for a fully electric hydrogen powered aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Indicative budget	<p>The total indicative funding budget for the topic is EUR 5 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Expected EU contribution per project	The Clean Aviation Joint Undertaking estimates that an EU contribution up to EUR 5 million would allow these outcomes to be addressed appropriately.
Special eligibility condition – limitation of the types of legal entities eligible to coordinate the project	<p>The coordinator role shall be limited to legal entities having the following type of organisation:</p> <ul style="list-style-type: none"> • University, • Research and Technology Organisation (RTO) or • SME (legal entities are advised to confirm their SME status¹⁴⁶).
Indicative project duration	Maximum 24 months.
Type of Action	Research and Innovation Actions.
Technology Readiness Level	<p>A minimum TRL3 shall be justified at project start for the considered technologies.</p> <p>Activities are expected to achieve TRL 5 at component level at project completion, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new hydrogen powered aircraft concepts.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia led by an SME, RTO or University with a proven track record in developing and delivering globally competitive research and innovation to aircraft programmes.</p> <p>Applicants should ensure their proposal and consortium reflect all necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional</p>

¹⁴⁶ Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422).

For more information, please follow this link:

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Industrial entities (except SMEs) are expected to join the consortium as Associated Partners with zero requested EU funding. Any form of participation in the proposal by industrial entities (except SMEs) and related funding allocation should be duly justified in relation to the objectives of the proposal and in terms of proposed European industrial exploitation, and should be limited to 10% in terms of funding allocation.</p>
Consortium Agreement	Participants in the project(s) selected under this topic must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.
Additional topic condition – special role in the project as “end-user” with possible participation as Associated Partner	<p>The proposals submitted under this topic are required to demonstrate the expected contribution to the aircraft concepts roadmap as specified in the Amended Work Programme and Budget 2026-2027 and, if any, other possible alternative industrial exploitation routes.</p> <p>The industrial “end-user” of the project shall be capable to integrate and mature the fully electric hydrogen fuel cell powered aircraft concept as addressed and described in the CAJU Amended Work Programme and Budget 2026-2027 and Clean Aviation SRIA. It shall be a European based aircraft manufacturer/integrator aiming at designing, developing, manufacturing and certifying a fully electric hydrogen fuel cell powered aircraft concept. The entity shall be identified as preferred end-user in the proposal, together with a description of its envisaged exploitation contribution.</p> <p>A letter of support from the preferred end-user(s) is not required at proposal submission. However, following the evaluation and potential selection, the preferred end-user(s) shall confirm their interest and role in relation to the project's results prior to the grant agreement signature.</p> <p>End-users are expected to formalise their involvement through the Consortium Agreement, to be signed after the Grant Agreement signature, and by joining the consortium as an Associated Partner¹⁴⁷, with zero requested EU funding.</p> <p>Other potential end-user(s) may be listed as well, also during the implementation of the project in line with other possible industrial exploitation routes.</p>
End-user's role	The applicant must indicate the expected role of the end-users in the proposal and how the end-user should contribute to the activity through

¹⁴⁷ For guidance on Article 9.1 Associated partners please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

	one or more of the following areas in line with Horizon Europe: <ul style="list-style-type: none"> • Analysing data for the project • Monitoring and/or evaluating R&I results • Testing & experimenting with innovative R&I solutions • Debating R&I findings and implications for them • Others (to be specified by the applicant).
Project Monitoring	The JU will perform a gate review no later than month 11 to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.

Expected Outcome:

Project results are expected to **develop and demonstrate a cryo-cooled power electronic module**, primarily for integration into future fully electric hydrogen fuel cell powered Aircraft concept.

Projects are expected to deliver the following outcomes:

- Develop a fully integrated, high efficiency and compact cryo-cooled motor inverter design compatible with the multi-MW fully electric hydrogen fuel cell powered aircraft concept, including the enabling cryo-cooling architecture.
- Develop and demonstrate an optimized cryogenic Gallium Nitride (GaN) power module at TRL5, for the proposed motor inverter design.
- Develop a power module and demonstrate its reliability using quantified data against aeronautical specifications at TRL5, delivering measured performance improvements at cryogenic temperatures.
- The inverter and power module technologies shall consider certification requirements and environmental conditions suitable for application on the fully electric hydrogen fuel cell powered Aircraft concept.
- Deliver a clear roadmap towards TRL6 demonstration addressing safety and certification for potential exploitation of the proposed technologies on the fully electric hydrogen powered aircraft concept.

The project shall consider cooperation and alignment with “HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment”, responsible for the integration of the fully electric hydrogen fuel cell aircraft concept, as a primary use-case for this fast-track activity. The project should also consider establishing an enhanced cooperation agreement with “HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-06 Superconducting motor windings for a fully electric hydrogen fuel cell powered aircraft”, responsible for the development and demonstration the superconducting electrical motor, the cryo-cooled inverter will drive

Scope:

Future fully electric hydrogen fuel cell powered aircraft concepts are expected to require high-

performance, reliable electrical propulsion systems. In a hydrogen powered aircraft, the liquid hydrogen stored at cryogenic temperatures, provides an inherent cold source enabling the use of cryo-cooled superconductive materials. Cryo-cooling of the electric propulsion power electronics can unlock the full potential of a fully-electric hydrogen powered aircraft concept by allowing lighter, more efficient, and more powerful components.

A key component of power electronics system is the power inverter, which should efficiently handle large power flows, while retaining a compact size. The performance and reliability of such inverters heavily depend on their power modules. Gallium Nitride (GaN) semiconductors are well-suited for this role, offering higher efficiency and power density than traditional silicon-based solutions. Projects can propose alternative cryo-cooled semiconductors materials to GaN, as long as they are able to achieve the topic performance targets

Applicants should demonstrate TRL3 at project start for proposed technologies and methods to be pursued. This should be based on synergies with activities from CA Phase 1 or funded by national/regional or other European programmes.

The present topic aims to develop, mature, and test a GaN cryogenic power module. The project scope should address the following areas:

- Definition of aerospace specifications for cryogenic GaN modules with integrators and design of optimized power module, addressing the extreme Coefficient of Thermal Expansion (CTE) mismatch challenges.
- Virtual development of a fully integrated cryocooled inverter and demonstration of the power density target at system level.
- Perform a comprehensive failure modes and failure hazards assessment (E.g: cryogenic hazards, insulation integrity, arc-fault risks, thermal-runaway, loss-of-cooling), including the identification of appropriate mitigations for the critical failures identified ensuring operational safety comparable to a conventional technology inverter.
- Definition of the required electrical and cryogenic cooling protections to prevent damage or hazards in case of loss of cryogenic cooling.
- Development of specific cryogenic driver module with isolated supply and Pulse Width Modulation (PWM).
- Manufacturing of a prototype cryogenic GaN modules and initial electrical/thermal characterisation.
- Extensive accelerated reliability tests (e.g. power/thermal cycling, dynamic on-resistance degradation) at cryogenic temperatures and failure analysis.
- Validation of quantified reliability data against aerospace specifications.

The demonstration activities should leverage an existing operational and specialised cryogenic high-power test facility and shall cover ground-based characterisation of the power modules' reliability in representative cryogenic conditions, to achieve a TRL5 at **component level by end of project**, including:

- Modelling and simulation of the electromagnetic, mechanical and thermal performance using advanced finite element analysis.
- Experimental validation of the power module performance in representative operating conditions (e.g: Cryogenic operating temperature, representative electrical/thermal load, etc).
- Accelerated reliability testing and failure characterisation of the proposed power module in representative operating cryogenic conditions. This should include:
 - o Partial Discharge and arc development and detection

- Low frequency thermal cycling (PCT), High frequency power cycling at motor current frequency (HF-PCT), Arc fault and heat diffusion
- Impact on Gate-Source voltage (GSS), Source-Drain voltage (DRB)
- Robustness assessment (e.g.: Short-circuit Robustness; Cosmic Radiation Immunity/Robustness)
- Assessment of the Mean Time Between Failures (MTBF) based on established standards like FIDES (UTE C 80-811)
- Virtual integration of the proposed motor design with the corresponding cryogenic power electronics and secondary cryo-cooling system.

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity).

Cooperation with the end-user (e.g. regarding performance and integration requirements, physical and data interfaces with aircraft and systems) will be established at project start.

The project shall identify potential synergies with the related activities funded under research and innovation programmes at regional¹⁴⁸, national¹⁴⁹ and European¹⁵⁰ level, and demonstrate how the project will benefit from these activities.

Performance Targets:

The following performance targets shall be pursued, in comparison to a clearly identified State-of-the-Art which shall be established in the proposal:

- The targeted operating input voltage shall be not higher than 500 V with at least 200 Arms AC output.
- Enabling 2MW-class Motor Control Units (MCUs), specifically for the fully electric hydrogen fuel cell powered aircraft concept.
- Inverter Power Density of at least 25kW/kg
- Inverter efficiency of at least 99%.
- Inverter lifetime of at least 10.000 flying hours
- Reliability aligned with SoA conventional electric motors targets. Definition of the specific reliability targets for the expected aeronautical environmental and operating conditions should be established with the end user at project start.
- Integration and cooling requirements to be established with the end-user at project start, in order to ensure compatibility with the fully electric hydrogen fuel cell powered aircraft concept.

These top-level goals should be broken down and complemented in a consistent manner at the different levels: from top-level aircraft requirements to motor inverter requirements, from where pertinent performance targets including Key Performance Indicators (KPIs) should be derived. KPIs shall be confirmed by the end user for the proposed electrical power system architecture design.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹⁵¹ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

¹⁴⁸ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹⁴⁹ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹⁵⁰ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

¹⁵¹ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

Proposal should include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology, associated risks and planned mitigation action.

HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-06 Superconducting motor windings for a fully electric hydrogen fuel cell powered aircraft

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Indicative budget	<p>The total indicative funding budget for the topic is EUR 5 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Expected EU contribution per project	The Clean Aviation Joint Undertaking estimates that an EU contribution up to EUR 5 million would allow these outcomes to be addressed appropriately.
Special eligibility condition – limitation of the types of legal entities eligible to coordinate the project	<p>The coordinator role shall be limited to legal entities having the following type of organisation:</p> <ul style="list-style-type: none"> • University, • Research and Technology Organisation (RTO) or • SME (legal entities are advised to confirm their SME status¹⁵²).
Indicative project duration	Maximum 24 months.
Type of Action	Research and Innovation Actions.
Technology Readiness Level	<p>A minimum TRL3 shall be justified at project start for the considered technologies.</p> <p>Activities are expected to achieve TRL 5 at component level at project completion, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in new hydrogen powered aircraft concepts.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia led by an SME, RTO or University with a proven track record in developing and delivering globally competitive research and innovation to aircraft programmes.</p> <p>Applicants should ensure their proposal and consortium reflect all</p>

¹⁵² Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422).

For more information, please follow this link:

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Industrial entities (except SMEs) are expected to join the consortium as Associated Partners with zero requested EU funding. Any form of participation in the proposal by industrial entities (except SMEs) and related funding allocation should be duly justified in relation to the objectives of the proposal and in terms of proposed European industrial exploitation, and should be limited to 10% in terms of funding allocation.</p>
Consortium Agreement	Participants in the project(s) selected under this topic must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.
Additional topic condition – special role in the project as “end-user” with possible participation as Associated Partner	<p>The proposals submitted under this topic are required to demonstrate the expected contribution to the aircraft concepts roadmap as specified in the Amended Work Programme and Budget 2026-2027 and, if any, other possible alternative industrial exploitation routes.</p> <p>The industrial “end-user” of the project shall be capable to integrate and mature the fully electric hydrogen fuel cell hydrogen powered aircraft concept as addressed and described in the CAJU Amended Work Programme and Budget 2026-2027 and Clean Aviation SRIA. It shall be a European based aircraft manufacturer/integrator aiming at designing, developing, manufacturing and certifying a fully electric hydrogen powered aircraft concept. The entity shall be identified as preferred end-user in the proposal, together with a description of its envisaged exploitation contribution.</p> <p>A letter of support from the preferred end-user(s) is not required at proposal submission. However, following the evaluation and potential selection, the preferred end-user(s) shall confirm their interest and role in relation to the project's results prior to the grant agreement signature.</p> <p>End-users are expected to formalise their involvement through the Consortium Agreement, to be signed after the Grant Agreement signature, and by joining the consortium as an Associated Partner¹⁵³, with zero requested EU funding.</p> <p>Other potential end-user(s) may be listed as well, also during the implementation of the project in line with other possible industrial exploitation routes.</p>
End-user's role	The applicant must indicate the expected role of the end-users in the

¹⁵³ For guidance on Article 9.1 Associated partners please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

	<p>proposal and how the end-user should contribute to the activity through one or more of the following areas in line with Horizon Europe:</p> <ul style="list-style-type: none"> • Analysing data for the project • Monitoring and/or evaluating R&I results • Testing & experimenting with innovative R&I solutions • Debating R&I findings and implications for them • Others (to be specified by the applicant).
Project Monitoring	<p>The JU will perform a gate review no later than month 11 to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.</p>

Expected Outcome:

Project results are expected to demonstrate the **performance and reliability of superconducting alternating current motor windings**, for integration into the future fully electric hydrogen fuel cell powered Aircraft concept addressed in Clean Aviation.

The project is expected to achieve the following outcomes:

- Deliver a high performance superconducting alternating current motor design compatible with the multi-MW fully electric hydrogen fuel cell powered aircraft concept, including the enabling cryo-cooling architecture.
- Develop and demonstrate a fully integrated, high efficiency and compact superconducting alternating current motor windings at TRL5, for the proposed motor design.
- Experimentally demonstrate the windings' reliability using quantified data against aerospace specifications.
- The motor and winding technologies shall consider certification requirements and environmental conditions suitable for application on the fully electric hydrogen fuel cell powered Aircraft concept.
- Deliver a clear roadmap towards TRL6 demonstration addressing safety and certification for potential exploitation on the fully electric hydrogen fuel cell powered aircraft concept.

The project shall consider cooperation and alignment with the project to be selected from "HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment", responsible for the integration of the fully electric hydrogen fuel cell aircraft concept, as a primary use-case of the results achieved by this fast-track activity. The project should also consider establishing an enhanced cooperation agreement with the project selected from "HORIZON-JU-CLEAN-AVIATION-2026-04-FTA-05 Cryo-cooled power electronics for a fully electric hydrogen fuel cell powered aircraft", responsible for the development and demonstration of the cryo-cooled inverter architecture which will drive the superconducting electric motor.

Scope:

Future fully electric hydrogen fuel cell powered aircraft concepts are expected to require high-

performance, reliable electrical propulsion systems. In a hydrogen powered aircraft, the liquid hydrogen stored at cryogenic temperatures, provides an inherent cold source enabling the use of cryo-cooled superconductive materials. These materials can unlock the full potential of a fully electric fuel cell propulsion by allowing lighter, more efficient, and more powerful electric motors.

A key component of the development of superconducting alternating current electric motors is the motor winding, which should efficiently handle large power flows, while retaining a compact size. The performance and reliability of the motor heavily depend on the material performance and winding design. High temperature superconductors with low current to critical current ratio are well-suited for this role, offering reduced electrical losses and a more compact and scalable motor architecture.

While superconducting materials are expected to deliver the best motor performance, projects can propose alternative cryo-cooled materials, as long as they are able to achieve the performance targets defined as part of the topic performance section.

Applicants should demonstrate TRL3 at project start for proposed technologies and methods to be pursued. This should be based on synergies with activities from CA Phase 1 or funded by national/regional or other European programmes.

The project scope shall include the following:

- Define a superconducting alternating current motor in the 2MW class, including the enabling electrical and cooling system architectures.
- Deliver and assess various electrical motor three-dimensional winding design geometries, optimised for low electrical loss and mechanical robustness.
- Demonstrate the manufacturing method compatible with the proposed coil and end-winding design, maximising the component reliability and robustness.
- Demonstrate by means of experimental test, the superconducting winding performance, including critical current density degradation for representative winding curvatures and operational conditions.
- Demonstrate the integrated cooling channel design for the thermal management of the windings, optimised to maintain a stable superconducting material temperature during operation.
- Characterise the reliability and lifetime of the proposed superconducting motor windings under relevant aircraft operational conditions, including the impact assessment of the thermal and electro-mechanical cycling.
- Develop and validate the interconnections between the superconducting windings and the cryogenic motor power electronics, including an assessment of the compatibility for the motor and power electronics designs proposed.
- Perform a comprehensive failure modes and failure hazards assessment (E.g.: cryogenic hazards, insulation integrity, arc-fault risks, thermal-runaway, loss-of-cooling), including the identification of appropriate mitigations for the critical failures identified ensuring operational safety comparable to a conventional technology motor.
- Define the required electrical and cryogenic cooling protections to prevent damage or hazards in case of loss of cryogenic cooling.

The demonstration activities should leverage an existing operational and specialised cryogenic high-power test facility and shall cover ground-based characterisation of the alternating current motor windings' reliability in representative cryogenic conditions, to achieve **TRL5 by the end of project**, including:

- Modelling and simulation of the electromagnetic, mechanical and thermal performance using advanced finite element analysis.

- Experimental validation of the winding performance under the expected aeronautical environmental and operational cryogenic conditions.
- Experimental characterisation of the electrical losses, mechanical stability, vibration robustness and thermal cycling performance, for the windings proposed.
- Virtual integration of the proposed motor design with the corresponding cryogenic power electronics and secondary cryo-cooling system.

The applicants are expected to detail the demonstration means, including test facilities (type, location, degree of representativity).

Cooperation with the end-user (e.g. regarding performance and integration requirements, physical and data interfaces with aircraft and systems) should be established at project start.

The contribution of the topic to the certification aspects will be handled by the industrial end-user(s) of the project and, where appropriate, with the support of the consortium members.

The project shall identify potential synergies with the related activities funded under research and innovation programmes at regional¹⁵⁴, national¹⁵⁵ and European¹⁵⁶ level, and demonstrate how the project will benefit from these activities.

Performance Targets:

The following performance targets shall be pursued, in comparison to a clearly identified State-of-the-Art which shall be established in the proposal:

- Critical current density retention of at least 95% after thermal and mechanical cycling.
- Motor power density of at least 20kW/kg for a 2MW class machine operating at 5000 rpm and with a torque density above 30Nm/kg
- Motor efficiency of at least 99%
- Motor lifetime of at least 10.000 flying hours
- Reliability aligned with SoA conventional electric motors targets. Definition of the specific reliability targets for the expected aeronautical environmental and operating conditions should be established with the end user at project start.
- Integration and cooling requirements to be established with the end-user at project start, in order to ensure compatibility with the fully electric hydrogen fuel cell powered aircraft concept.

These top-level goals should be broken down and complemented in a consistent manner at the different levels: from top-level aircraft requirements to electrical motor requirements, from where pertinent performance targets including Key Performance Indicators (KPIs) should be derived. KPIs shall be confirmed by the end user for the proposed electrical power system architecture design.

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹⁵⁷ objectives. The applicant should provide the assumptions

¹⁵⁴ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹⁵⁵ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹⁵⁶ activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

¹⁵⁷ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely

and the rationale underlying those target definitions and values.

Proposal should include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology, associated risks and planned mitigation action.

Description of the call topic and topic specific conditions	
Chapter 2.4.3 of the Amended Work Programme and Budget 2026-2027 and the General Annexes to the HE Work Programme define the rules applicable to this call topic as complemented by the specific conditions listed below	
Indicative budget	<p>The total indicative funding budget for the topic is EUR 5 million.</p> <p>The Clean Aviation Joint Undertaking may award up to 1 project with funding depending on the outcome of the evaluation and the complementarity of the proposed actions.</p>
Expected EU contribution per project	The Clean Aviation Joint Undertaking estimates that an EU contribution up to EUR 5 million would allow these outcomes to be addressed appropriately.
Special eligibility condition – limitation of the types of legal entities eligible to coordinate the project	<p>The coordinator role shall be limited to legal entities having the following type of organisation:</p> <ul style="list-style-type: none"> • University, • Research and Technology Organisation (RTO) or • SME (legal entities are advised to confirm their SME status¹⁵⁸).
Indicative project duration	Maximum 24 months.
Type of Action	Research and Innovation Actions.
Technology Readiness Level	<p>A minimum TRL3 shall be justified at project start for the considered technologies.</p> <p>Activities are expected to achieve TRL 4 at component level at project completion, as indicated in section 'Expected Outcome'.</p> <p>Applicants must provide a detailed plan of the TRL steps and a roadmap that can deliver the technology maturity needed by the end of Clean Aviation for the results of their project to be included in future hydrogen powered aircraft concepts.</p> <p>See General Annex B of Horizon Europe for a guide to the TRL definitions and criteria to be used.</p>
Special skills and/or capabilities expected from the Applicant(s)	<p>The Clean Aviation Joint Undertaking expects proposals to be submitted by consortia led by an SME, RTO or University with a proven track record in developing and delivering globally competitive research and innovation to aircraft programmes.</p> <p>Applicants should ensure their proposal and consortium reflect all</p>

¹⁵⁸ Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422).

For more information, please follow this link:

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

	<p>necessary expertise and capabilities. Applicants should identify and include the additional expertise needed to complement the traditional aeronautical domain, in order to effectively address the incorporation of new/disruptive technologies. Where appropriate, the consortium should include newcomers to the programme and to the field of aeronautics and in particular SMEs, start-ups and/or knowledge centres that can bring disruptive innovation to the project as proposed.</p> <p>Industrial entities (except SMEs) are expected to join the consortium as Associated Partners with zero requested EU funding. Any form of participation in the proposal by industrial entities (except SMEs) and related funding allocation should be duly justified in relation to the objectives of the proposal and in terms of proposed European industrial exploitation, and should be limited to 10% in terms of funding allocation.</p>
Consortium Agreement	Participants in the project(s) selected under this topic must conclude a suitable Consortium Agreement [CA] governing the project and its consortium. A model of the Consortium Agreement is available on the F&T portal in the call topic's documents.
Additional topic condition – special role in the project as “end-user” with possible participation as Associated Partner	<p>The proposals submitted under this topic are required to demonstrate the expected contribution to the aircraft concepts roadmap as specified in the Amended Work Programme and Budget 2026-2027 and, if any, other possible alternative industrial exploitation routes.</p> <p>The industrial “end-user” of the project shall be capable to integrate and mature the hydrogen powered aircraft concepts as addressed and described in the CAJU Amended Work Programme and Budget 2026-2027 and Clean Aviation SRIA. It shall be a European based aircraft manufacturer/integrator aiming at designing, developing, manufacturing and certifying a hydrogen powered aircraft concept. The entity shall be identified as preferred end-user in the proposal, together with a description of its envisaged exploitation contribution.</p> <p>A letter of support from the preferred end-user(s) is not required at proposal submission. However, following the evaluation and potential selection, the preferred end-user(s) shall confirm their interest and role in relation to the project's results prior to the grant agreement signature.</p> <p>End-users are expected to formalise their involvement through the Consortium Agreement, to be signed after the Grant Agreement signature, and by joining the consortium as an Associated Partner¹⁵⁹, with zero requested EU funding.</p> <p>Other potential end-user(s) may be listed as well, also during the implementation of the project in line with other possible industrial exploitation routes.</p>
End-user's role	The applicant must indicate the expected role of the end-users in the proposal and how the end-user should contribute to the activity through

¹⁵⁹ For guidance on Article 9.1 Associated partners please follow this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

	one or more of the following areas in line with Horizon Europe: <ul style="list-style-type: none"> • Analysing data for the project • Monitoring and/or evaluating R&I results • Testing & experimenting with innovative R&I solutions • Debating R&I findings and implications for them • Others (to be specified by the applicant).
Project Monitoring	The JU will perform a gate review no later than month 11 to assess the overall progress against the project plan and against the performance targets. Depending on the outcome of this key gate review, the scope of the project may be revised and/or funding reduced in case of significant issues. Mitigation actions may be requested by the JU as condition for continued funding.

Expected Outcome:

Project results are expected to demonstrate **an innovative lightweight and reliable liquid hydrogen tank concept**, for integration into hydrogen powered aircraft concepts addressed in Clean Aviation.

Projects are expected to achieve the following outcomes:

- Design, develop and demonstrate an innovative lightweight and reliable tank at TRL4, with gravimetric index and dormancy targets as defined in the topic performance section.
- Demonstrate the hydrogen tank structural and tightness reliability for the full spectrum of in-service operational and environmental conditions.
- Develop and demonstrate the feasibility of the proposed tank concept manufacturing and industrialization processes at TRL4, supporting an economically viable hydrogen powered aircraft concept.
- The hydrogen tank concept shall develop and justify appropriate means of compliance for the expected certification requirements suitable for application on the hydrogen powered aircraft concepts.
- Deliver a clear roadmap towards TRL6 demonstration addressing safety and certification for potential exploitation on the hydrogen powered aircraft concepts.

The project shall consider cooperation and alignment with the project to be selected from “HORIZON-JU-CLEAN-AVIATION-2026-04-ACI-01 Hydrogen powered aircraft concept and key technologies integration and impact assessment”, responsible for the integration of the hydrogen aircraft concepts, as a primary use-case of the results achieved for this fast-track activity. The project shall also consider establishing a cooperation agreement with the project to be selected from “HORIZON-JU-CLEAN-AVIATION-2026-04-HPA-02 Demonstration of an integrated hydrogen fuel system for a fully electric hydrogen fuel cell powered aircraft”, responsible for the development and demonstration of the corresponding hydrogen fuel system architecture.

Scope:

Future hydrogen powered aircrafts will require storing cryogenic liquid hydrogen in lightweight, safe and reliable hydrogen tanks. The hydrogen tank is expected to be stored in the rear fuselage of the aircraft, behind the cabin pressure bulkhead, with a fuselage cylindrical diameter of approximately 3.5 to 4m diameter. Depending on the hydrogen powered aircraft concept, different tank size will be

expected to satisfy the aircraft requirements. While for the fully electric hydrogen fuel cell powered aircraft concept two tanks of approximately 600kg each are expected to be required, for the direct hydrogen combustion powered aircraft concept, two tanks of approximately 1000kg are expected to be required. In either hydrogen powered aircraft concepts, the tank diameters may range from 1.5m diameter up to 3.5m diameter, depending on whether the tanks are installed in a side-by-side configuration, or in a tandem configuration.

Despite the significant progress made over the past years, the hydrogen tank performance should be improved to enable a viable hydrogen powered aircraft concept. A break-through in tank technology is therefore required to demonstrate a lightweight tank technology capable of meeting the thermal insulation (dormancy), safety and reliability requirements through the hydrogen tank's service lifetime. For tanks based on the dewar principle, the thermal insulation performance of the tank and internal systems will be dependent on demonstrating gas-tightness reliably, under the deforming and vibrating conditions representative of the aircraft environment.

Applicants should demonstrate TRL3 at project start for proposed technologies and methods to be pursued. This should be based on synergies with activities from CA Phase 1 or funded by national/regional or other European programmes. Proposal shall clearly identify the progress beyond the state of the art expected to be delivered by the innovations and technologies identified, and detail the contribution of these technologies to improving the tank weight, reliability, tightness and safety shortcomings.

The present topic aims to develop, mature and test an innovative lightweight and reliable hydrogen storage tank. The project scope shall include the following:

- Design, deliver and demonstrate an innovative hydrogen tank design capable of delivering a significant improvement on tank weight efficiency and reliability:
 - o Modelling and simulation of the tank structural capability to sustain the full spectrum of operational loads in representative conditions.
 - o Prototyping and experimental testing of the critical tank features for the structural model refinement.
- Experimental sub-scale demonstration of the tank thermal insulation performance (dormancy time) in representative cryogenic conditions, including the characterisation of leakages affecting the thermal insulation performance:
 - o Tightness of all inner and outer tank interfaces (installation of ports, feedthroughs, connections, sensors, etc.) shall be assessed.
 - o Modelling and experimental testing of the microcrack-related leakages that may occur due to cryogenic temperatures, thermal cycling, CTE mismatch, vibrations, or global fuselage deformations shall be investigated and characterised.
- Demonstrate the manufacturing, assembly, maintenance and repair methods enabling the delivery of a commercially viable hydrogen tank design.
- Perform a comprehensive failure modes and failure hazards assessment for the proposed tank design, including the identification of appropriate mitigations for the critical failures identified.
- Define the required hydrogen and cryogenic protections to prevent damage or hazards in case of a hydrogen leak or a loss of insulation.

The demonstration activities should leverage an existing operational and specialised cryogenic test facility and shall cover a ground-based characterisation of the hydrogen tank in representative cryogenic conditions, to achieve a TRL4 by the end of project, including:

- Modelling and simulation of the structural and thermal performance of the LH2 hydrogen tank using advanced finite element analysis.
- Experimental validation of the hydrogen tank integrity (leak tightness) and thermal insulation performances through sub-scale tank testing under representative cryogenic operational conditions.
- Experimental characterisation of the leakage tightness and thermal insulation degradation across the tank in service life.
- Manufacturing trials, including destructive and non-destructive quality assessment for the tank critical features.
- Virtual aircraft integration of the proposed hydrogen tank, including the structural assessment of operational loads (gust loads, hard landing, cycling and vibration loads, etc.) under representative environmental and operational conditions.

The applicants are expected to detail the demonstration means, including test facilities (type, location) and the degree of representativeness of the proposed sub-scale and sub-element demonstration strategy.

Cooperation with the end-user (e.g. regarding performance and integration requirements, physical and data interfaces with aircraft and systems) should be established at project start.

The contribution of the topic to the certification aspects will be handled by the industrial end-user(s) of the project and, where appropriate, with the support of the consortium members.

The project shall identify potential synergies with the related activities funded under research and innovation programmes at regional¹⁶⁰, national¹⁶¹ and European¹⁶² level, and demonstrate how the project will benefit from these activities.

Performance Targets:

The following performance targets shall be pursued, in comparison to a clearly identified State-of-the-Art which shall be established in the proposal:

- A gravimetric index¹⁶³ no less than 40% for the full scale hydrogen powered aircraft concept tank.
- A dormancy time no less than 12 hours.
- An operating target pressure of no less than 5 bars with an ultimate pressure of no less than 10 bas.
- Manufacturing and MRO (maintenance and repair) requirements to be established with the end-user at project start, in order to ensure the feasibility of the proposed liquid hydrogen tank concept.

These top-level goals should be broken down and complemented in a consistent manner at the different levels: from top-level aircraft requirements to hydrogen tank requirements, from where pertinent performance targets including Key Performance Indicators (KPIs) should be derived.

¹⁶⁰ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹⁶¹ activities funded in Member States and Associated Countries and/or funded through EU funds administrated by regional or national authorities such as the European Regional Development Fund (ERDF).

¹⁶² activities funded under Horizon Europe (outside the Clean Aviation Work Programme 2026-2027) and/or other EU programmes.

¹⁶³ The gravimetric index is defined as the ratio of the mass of the Liquid hydrogen stored to the total system mass, including the complete tank structure and tank systems (E.g.: Internal hydrogen tank distribution system and components, tank connection ports, thermal insulation, structural interfaces).

All relevant performance KPIs shall be identified and quantified in terms of targets by the proposers, guided by principles such as S.M.A.R.T.¹⁶⁴ objectives. The applicant should provide the assumptions and the rationale underlying those target definitions and values.

Proposal should include a detailed project plan with key milestones and deliverables, together with a list of performance targets per critical technology, associated risks and planned mitigation act

¹⁶⁴ S.M.A.R.T.: Specific, Measurable, Achievable, Relevant, Timely.