D4.1 – Handbook for synergies

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Abstract

The ECARE project, funded by Clean Aviation, seeks to clarify the European aeronautical funding landscape and create synergies between European, national, and regional funding bodies. This handbook serves as a comprehensive guide for stakeholders to replicate the methodologies developed within the ECARE project, maximizing public funding efficiency and aligning efforts with Clean Aviation's strategic objectives.

The handbook outlines a six-phase pathway for implementing synergies across funding levels. The first phase involves evaluating the regional ecosystem, where stakeholders use the ECARE taxonomy and digital platform to map their aeronautical landscape. Phase two focuses on strategic alignment, ensuring coherence between regional, national, and European strategies and roadmaps.

Phases three and four emphasize the importance of communication and harmonization. They advocate for regular meetings and joint communication among funding bodies, alongside standardized data sharing and application processes to streamline operations. The final phases centre on project emergence and improving existing mechanisms, including issuing calls for projects aligned with Clean Aviation objectives.

The handbook details 18 synergy mechanisms designed to foster strategic alignment, enhance communication, harmonize processes, and optimize funding opportunities. These mechanisms, alongside tools like the ECARE Digital Platform, taxonomy, and taxonomy tool, offer a comprehensive framework for stakeholders to navigate funding opportunities and funded projects, identify potential partners, and maximize their impact in achieving a sustainable aviation future.

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This handbook serves as a valuable resource for regional, national and/or European funding bodies, clusters, and other stakeholders seeking to optimize the use of public funds and drive sustainable aviation innovation. It provides comprehensive guidance on replicating the processes and methodologies developed within the ECARE project.

Keywords

Funding synergy mechanisms, European best practices, ECARE Taxonomy, Data collection, Data analysis, Mapping, ECARE Digital Platform, Strategic Alignment, Public funding, Funding bodies, Stakeholder Collaboration, Handbook, Aeronautical Innovation, Decarbonization.

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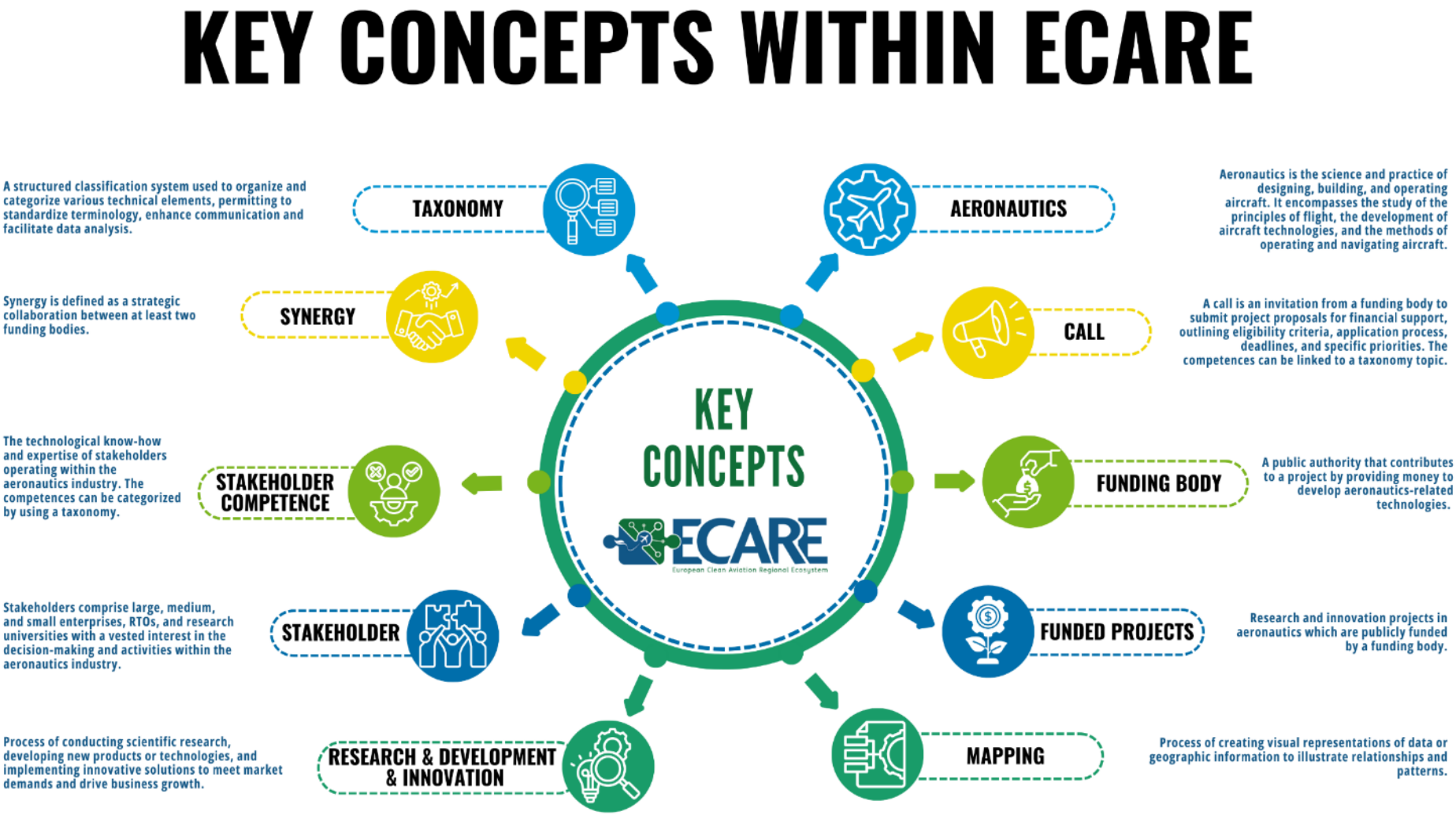
Table of acronyms and definitions

The meaning of acronyms, terms and definitions specifically assumed for the context of the present activities are reported in the following sections.

Acronyms:

AI	Artificial Intelligence
AV	Aerospace Valley
CA	Clean Aviation
CAJU	Clean Aviation Joint Undertaking
DAC	Campania Aerospace District
EACP	European Aerospace Cluster Partnership
EASN-TIS	EASN - Technology Innovation Services
ECARE	European Clean Aviation Regional Ecosystems
EDP	ECARE Digital Platform
ESG	ECARE Stakeholder Group
GACP	Global Aerospace Cluster Partnership
HAV	Hamburg Aviation
IPCEI	Important Project of Common European Interest
ISE	Intermediate Sized Enterprise
KPIs	Key Performance Indicators
MoC	Memorandum of Cooperation
NWS	National Workshop
RTO	Research and Technology Organisation
SME	Small and Medium-sized Enterprise
SRG	State Representative Group
TNWS	Transnational Workshop


KEY CONCEPTS WITHIN ECARE
KEY CONCEPTS
ECARE
European Clean Aviation Regional Ecosystem
TAXONOMY
A structured classification system used to organize and categorize various technical elements, permitting to standardize terminology, enhance communication and facilitate data analysis.
AERONAUTICS
Aeronautics is the science and practice of designing, building, and operating aircraft. It encompasses the study of the principles of flight, the development of aircraft technologies, and the methods of operating and navigating aircraft.
SYNERGY
Synergy is defined as a strategic collaboration between at least two funding bodies.
CALL
A call is an invitation from a funding body to submit project proposals for financial support, outlining eligibility criteria, application process, deadlines, and specific priorities. The competences can be linked to a taxonomy topic.
STAKEHOLDER COMPETENCE
The technological know-how and expertise of stakeholders operating within the aeronautics industry. The competences can be categorized by using a taxonomy.
FUNDING BODY
A public authority that contributes to a project by providing money to develop aeronautics-related technologies.
STAKEHOLDER
Stakeholders comprise large, medium, and small enterprises, RTOs, and research universities with a vested interest in the decision-making and activities within the aeronautics industry.
FUNDED PROJECTS
Research and innovation projects in aeronautics which are publicly funded by a funding body.
RESEARCH & DEVELOPMENT & INNOVATION
Process of conducting scientific research, developing new products or technologies, and implementing innovative solutions to meet market demands and drive business growth.
MAPPING
Process of creating visual representations of data or geographic information to illustrate relationships and patterns.

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1. Handbook at a glance

The ECARE project, funded by Clean Aviation (CA), has the primary objective of clarifying the landscape of regional and national innovation roadmaps and the funding opportunities for aeronautical stakeholders in order to create synergies between the funding bodies on all three levels. The aim is to enable the European aeronautical industry to achieve the ambitious targets of the Clean Aviation Joint Undertaking (CAJU) programme while maximising public funding impact and efficiency, respecting potential specific national and regional priorities. As a response to these requirements, the ECARE project developed and disseminated methodologies to create synergy mechanisms which are applicable to all EU aeronautical regions. These methodologies have been designed and tested on a pilot scale, involving four major regions of the European aeronautical industry, namely Occitanie and Nouvelle-Aquitaine in France, Campania in Italy and Hamburg in Germany. A key outcome of the project is the ECARE Digital Platform, a valuable tool for stakeholders to map and identify funding opportunities, funded projects and stakeholders' competences, and facilitate collaboration across the European aeronautical ecosystem.

This Handbook aims to provide users with the information needed to replicate within their own environments and the processes and methodologies developed under the ECARE project within the framework of CAJU objectives. The ultimate goal is to contribute effectively to these objectives and foster stronger synergies between funding bodies at European, national, and regional level. The Handbook is applicable to the field of aeronautic technology development in Europe, specifically within the scope of CAJU.

This document is divided into different sections. Section 1 represents the introduction of the purpose and structure of the document**.** Then, **Section 2** introduces the concept of synergies, its application in European public funding and aeronautics, and highlights the ecosystem needed to implement synergies.

Section 3 is dedicated to successfully implementing synergies. All the synergies presented in section 4 are regrouped by phases. Each phase is detailed to promote the use of ECARE synergies, proposes an implementation pathway and provide concrete examples.

Section 4 focuses on the detailed presentation of each ECARE synergy mechanism, highlighting their specific characteristics. Each mechanism is described with a brief description, including strengths, limits, policy considerations, necessary actors and the main steps to follow for implementing the synergy. The final part of each synergy presents the ECARE recommendations for implementation, providing additional information on how to successfully implement each synergy. **This serves as a guide for funding bodies and clusters to replicate the ECARE project's approach and implement synergies in their region or country.**

Finally, **Section 5** is dedicated to the various tools developed by ECARE. It presents their origins, the motivations behind their creation, a comprehensive methodology for using each tool, an illustrative example of its use within ECARE, and the results achieves through its application.

In conclusion, the Handbook provides a concise, user-friendly and comprehensive overview of the processes and methodologies developed by the ECARE project, and validated with key actors and data from four pilot regions of the European aeronautical industry in France, Germany and Italy. Users can follow the instructions in each section of the Handbook, customize them with respect to their specific ecosystem and utilise the ECARE tools.

2. Introduction to synergies

Synergies to achieve a common goal play an increasingly important role in European public funding. This section is dedicated to exploring synergies and discover the ecosystem in the field of aeronautics.

2.1 Use of synergies in European public funding and aeronautics

The importance of synergies within the context of European funding was first addressed by the European Commission in 2007, naming synergies of the funding instruments of the European research, innovation and cohesion policies as necessary means to their effectiveness[1]. Since then, the relevance of synergies has been increasing over the years, in the legal frameworks of Horizon 2020 and European Structural and Investment Funds (ESIF), the need for synergies between the programs was specifically mentioned. Following these frameworks, in 2014 the European Commission published a guidance paper for policy-makers and implementing bodies on *Enabling synergies between European Structural and Investment Funds, Horizon 2020 and other research, innovation and competitiveness-related Union programmes*[2].

In the guidance paper, synergies are defined as joint or coordinated efforts to achieve a greater impact and efficiency, not only a combination of funds[3]. To facilitate synergies, the Commission aimed for a strategic approach with a medium to long-term perspective. This included the involvement of stakeholders in the 'entrepreneurial discovery process' to develop smart specialization strategies (RIS3 – Research and Innovation Strategies for Smart Specialisation). The Commission advocated for synergies by combining Horizon 2020 and ESIF funding within the same project, or through sequential projects that build on each other. Additionally, parallel projects or roadmaps that complement each other were encouraged[4].

Clean Sky 2 (CS2), predecessor of Clean Aviation Joint Undertaking (CAJU), **was one of the seven joint undertakings** supported by the Horizon 2020 program**, designed to enhance collaboration within the European aerospace industry.** To achieve synergies with ESIF, CS2 established a set of Memoranda of Understanding with Regional Authorities in order to align CS2 thematic objectives with regional strategies and RIS3[5]. The alignment facilitated projects complementary to CS2 on regional level funded by ESIF. Additionally, proposals to CS2 calls were able to propose a separate work package to be individually evaluated and funded by ESIF, which leads to a broader project-scopes. At the end of CS2, 18 MoU had been signed, four at national level and 14 at regional level. This led to the launch of 52 pilot projects with a total budget of more than EUR 50m[6]. While it can be positively noted that the MoU established a long-term dialogue and cooperation between CS2 and Regional authorities, a variety of limitations and barriers for the call-applicants still existed[7].

An assessment of the scope of synergies between H2020 and the ESIFs in the 2014-2020 period finds room to improve the establishing of synergies. For example, only a small number of projects had successfully received ESIF funding after obtaining a H2020 Seal of Excellence. Lack of knowledge about H2020 projects and potential synergies, as well as difficulties in aligning the frameworks, were identified

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52007DC0474, last accessed 29th of October 2024
[2] https://op.europa.eu/en/publication-detail/-/publication/e39e8352-3553-49ac-aef4-5760ac246ba6/language-fr, last accessed 29th of October 2024
[3] https://ec.europa.eu/regional_policy/sources/guides/synergy/synergies_en.pdf, p.3, last accessed 29th of October 2024
[4] https://ec.europa.eu/regional_policy/sources/guides/synergy/synergies_en.pdf, p.3, last accessed 29th of October 2024
[5] https://www.era-learn.eu/documents/good_practice_catalogue_synergies, p.11, last accessed 29th of October 2024
[6] https://clean-aviation.eu/sites/default/files/2022-11/CleanAviation-synergies-report_en.pdf, p.1, last accessed 29th of October 2024
[7] https://www.era-learn.eu/documents/good_practice_catalogue_synergies, p.17-18, last accessed 29th of October 2024

to limit the success of synergies[8]. Lastly, the lack of a system to monitor established synergies aggravated the identification and promotion of good practice examples[9].

Horizon Europe as a successor of H2020 also plans to establish synergies by introducing a legal obligation to do so. The target is to establish synergies with other European funding programs such as R&I framework programmes and the European Structural and Investment Funds, but also with EU member states' actions and within the Horizon Europe program itself. In the new Horizon Europe Strategic Plan 2025-2027, the term "synergies" has been highlighted 131 times. The plan defines synergies as the following:

The creation of synergies refers to the interaction of two or more programmes aiming to enhance the effects that could be achieved by individual intervention[10].

The types of synergies specified to be applied with Horizon Europe are subdivided in several types, two examples being Upstream and Downstream synergies: *Upstream synergies aim to support capacity-building activities for research to increase the chances of beneficiaries being successful in the framework programme's application process, while downstream synergies refer to the deployment of results from Horizon Europe's projects in other programmes or initiatives[11].* Other options for synergies are alternative funding facilitated by a Seal of Excellence (SoE), the transfers of resources and cumulative funding. Lastly, synergies with European partnerships are named[12], examples for such partnerships are Clean Aviation Joint Undertaking, SESAR Joint Undertaking and Clean Hydrogen Joint Undertaking. The SoE is a downstream synergy, several national funding bodies in Europe have introduced schemes to support projects awarded with an SoE by the European Innovation council (EIC)[13]. To facilitate the use of SoE, the European Commission simplified the rules for State Aid combined with EU support[14].

It is recognised that changes have to be made in order to maximise the potential of synergies. Next to improving cooperation between EU and national bodies by exchanging regularly, improving the overall flow of information about projects between the European Commission and the Member States, the necessity of a systematic monitoring of the program and use of the respective data is essential.

To continue the efforts made in CS2, CAJU is working together with European regions and has signed four Memoranda of Cooperation since 2023: With Occitanie in France, Campania and Piedmont in Italy and Hamburg in Germany. Synergies between Clean Aviation and regional funding programmes in these regions are expected to increase the number of low-emission aircraft disruptive technologies and

[8] https://www.eca.europa.eu/lists/ecadocuments/sr22_23/sr_h2020_and_esi_funds_en.pdf, p.5, last accessed 29th of October 2024

[9] https://www.eca.europa.eu/lists/ecadocuments/sr22_23/sr_h2020_and_esi_funds_en.pdf, p.4, last accessed 29th of October 2024

[10] https://op.europa.eu/en/publication-detail/-/publication/6abcc8e7-e685-11ee-8b2b-01aa75ed71a1, p.46, last accessed 29th of October 2024

[11] https://op.europa.eu/en/publication-detail/-/publication/6abcc8e7-e685-11ee-8b2b-01aa75ed71a1, p.46, last accessed 29th of October 2024

[12] https://op.europa.eu/en/publication-detail/-/publication/6abcc8e7-e685-11ee-8b2b-01aa75ed71a1, p.47-48, last accessed 29th of October 2024

[13] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/seal-excellence/eic-seal-excellence-opportunities_en, last accessed 29th of October 2024

[14] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/seal-excellence/how-can-seal-holders-use-seal-excellence_en, last accessed 29th of October 2024

concepts, increase the competitiveness of regional aviation players, in particular SMEs; and create jobs and skills required for aviation transition towards climate-neutrality[15].

2.2 The ecosystem to implement synergies

In order to give recommendations for synergies, the ecosystem in which they will be implemented has to be taken into consideration. The ECARE project focusses on recommendations between the Clean Aviation program, regional and national funding programs in the aeronautics industry. The CAJU has been launched in 2021 as a successor of the Clean Sky 2 Joint Undertaking. CAJU is a European Private Public Partnership which is supported by the European Commission's Horizon Europe research and innovation funding programme within Pillar II, Cluster 5: Climate, Energy & Mobility[16]. In the recommendations for synergies in this document, CAJU is referred to as "European funding body", to be viewed as one out of many specific funding bodies in the European landscape. Other European funding programs could introduce synergies with national and regional funding bodies such as Clean Hydrogen Joint Undertaking, SESAR Joint Undertaking, Eurostars, Innovation fund, LIFE, European Innovation Council, Connecting Europe Facility, and other programs.

The national and regional funding bodies considered in this handbook are the funding bodies of the pilot regions and countries of ECARE, Occitanie and Nouvelle-Aquitaine in France, Campania in Italy and Hamburg in Germany. The proposed synergies could also be replicated in other regions which have similar ecosystems, such as Piemonte (Italy), Andalucia (Spain) and Provence-Alpes-Côte d'Azur (France).

To successfully implement synergies with a European funding body, an ecosystem with the following characteristics should ideally already be in place:

1) A significant number of companies, institutions, research centres and similar entities working in the aeronautics industry must be present.
2) The country or region would ideally have established regional and/or national funding bodies and funding programs, either in aeronautics or related to more general support for research and innovation and economic growth.
3) An already signed MoC with Clean Aviation and/or MoU with CS2[17]as described in chapter 2.1 or related collaboration with EU funding bodies, would demonstrate their interest in aligning with European funding.
4) The incorporation of the development of local aeronautics industry into the RIS3.

The three ECARE regions, together with a fourth region that has signed a MoC with Clean Aviation (as of December 2024), form a dynamic ecosystem as described. This makes them the ideal starting point for establishing synergies.

2.3 ECARE definition of synergy

When starting the project, it has been necessary to agree on an appropriate definition of synergy in the ECARE context. The European Commission and Horizon Europe definitions as described in Chapter 2.1 were taken into consideration. The following definition of the term "Synergy" as referred in this handbook has been agreed:

[15] https://www.clean-aviation.eu/media/news/clean-aviation-hamburg-set-strategic-cooperation-to-accelerate-innovation-for-net-zero-aviation, last accessed 29th of October 2024

[16] https://cleansky.paddlecms.net/about-us/who-we-are/horizon-europe-eu-partnerships, last accessed 29th of October 2024

[17] https://cor.europa.eu/en/Documents/Examples%20of%20Synergies%20in%20CS2_Oct%202022.pdf, p.1, last accessed 29th of October 2024

Synergy is defined as a strategic collaboration between at least two funding bodies. The purpose is to generate financial leverage and enhance operational efficiency with the ultimate goal of advancing innovations to meet aircraft decarbonization objectives.

Synergies in this context translate into the rationalisation of public funds by minimizing funding duplications and ensuring the best use of funds across all funding levels. Synergies should also expedite funding processes to maintain competitiveness and increase efficiency. Lastly, synergies between at least two funding bodies, but possibly more, aim to mobilize all relevant stakeholders in aeronautics in Europe.

2.4 The synergy process of the ECARE project

The ECARE project, initiated in January 2023, began by establishing a taxonomy. The consortium collaboratively identified essential technical domains for aircraft development, resulting in **24 technical domains and 210 technological bricks (see the ECARE taxonomy**). This ECARE Taxonomy is designed to replace the previous taxonomy (produced by ACARE) used in Europe for more than 20 years, supposed to become a reference for the next years.

To understand industry perspectives on funding and synergy, the consortium conducted interviews with 58 aeronautical entities. These discussions identified common themes across the three pilot countries, leading to a consensus on **key synergy needs (detailed in D3.1**).

To populate the ECARE Digital Platform (See section 5.3: The ECARE Digital Platform: A complete tool) with initial data, the consortium collected information on funding opportunities, funded projects, and stakeholder competencies. A total of 291 calls (201 European, 47 nationals, and 43 regionals) were identified and integrated. Additionally, data on 246 research and innovation funded projects was gathered through various sources, including consortium member experience, internal databases, and direct information from funding bodies. Finally, the ECARE partners identified 347 stakeholders with relevant aviation technical competencies. **All collected data was linked to the ECARE taxonomy for interoperability (see D2.1 for details).**
Following the taxonomy, interviews, and data collection, three national workshops were held in parallel across the pilot countries. These workshops aimed to present ECARE progress, consult with national/regional funding bodies, and gather insights on synergy needs, experiences, and best practices regarding synergies with Clean Aviation and beyond.

The ECARE project analysed the workshop outputs to identify funding gaps and potential synergy mechanisms. Ten key needs were consolidated from 19 initial needs, while **17 funding gaps and 18 potential synergies were identified from project inputs**. The analysis revealed a strong correlation between gaps and needs and demonstrated that all gaps could be addressed through the identified synergies. The synergies were distributed in four categories: strategic alignment, communication and transparency, harmonization of processes, and emerging funding opportunities (Figure 1)**. All of these findings are detailed in D3.2 and serve as input for developing concrete synergy proposals** and recommendations for stakeholders within this handbook.

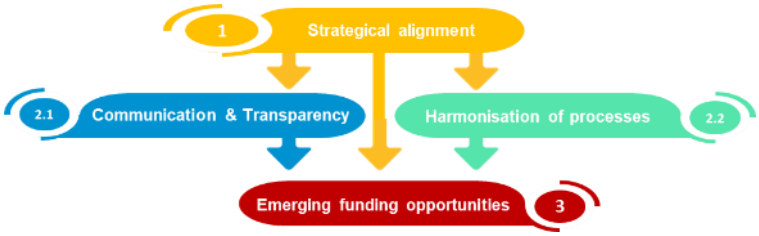


Figure 1: ECARE pathway to synergies

A key project milestone was the Transnational Workshop held at the Clean Aviation Joint Undertaking in Brussels. This event brought together 33 stakeholders from the aeronautics community, including funding bodies, clusters, and networks. The preliminary synergies identified in D3.2 were commented and discussed by the workshop participants to obtain the perspectives of different regions and stakeholders.

Lastly, a second round of National Workshops was organized to present selected synergies to national and regional funding bodies and discuss implementation. These workshops supported the validation of the propositions and gather best practices and feedback of the funding bodies.

The ECARE project tested synergies in France, Germany, and Italy, aiming for broader European replication. To facilitate this, the ECARE Stakeholder Group (ESG) was established, now comprising 44 members from 18 countries (status as of December 2024). The ESG includes aerospace clusters, networks, funding bodies, and other key aeronautical stakeholders (see the ECARE website).

The content of this handbook considers all the results which have been generated by the work of the project. The handbook serves as a summary to the topic of synergies and presents the pathway to achieve them. The different phases to follow are described in the next chapter, while 18 specific synergy mechanisms are detailed in chapter 4. Lastly, chapter 5 presents the ECARE toolbox containing methodologies to support the synergy implementation process.

3. ECARE pathway to synergies

The ECARE project provides a structured framework designed to establish synergies by harmonizing funding processes, encouraging strategic alignment, and fostering communication between key actors. This chapter focusses on how to successfully implement synergies between funding bodies by outlining a six-phase process to follow.

The ECARE synergy strategy is built upon four essential pillars, each of which is linked to a colour that will be used in the next implementation schemes:

- **Strategical alignment represented in yellow** to coordinate different funders and achieve common objectives,
- **Communication and transparency in blue** to foster collaboration and transparency actions,
- **Harmonisation of processes in green** to promote the standardisation of procedures to facilitate stakeholders' access and the efficient management of funding for public funding bodies,
- **Emerging funding opportunities in red** for the creation of innovative projects that leverage synergies between different funding bodies.

Figure 2: ECARE main synergy pillars

Additionally, **the graphical scheme presents three key types of stakeholders** involved in the implementation for each phase:

- **Clusters:** These are collaborative networks of organizations, primarily from the aeronautics sector, that foster knowledge sharing, resource pooling, and the development of innovative projects. Clusters play a crucial role in connecting SMEs, large corporations, research centres, and other relevant actors within a specific geographical area.
- **Funding bodies:** These entities provide the financial resources necessary for project implementation and act as the main drivers of synergy. Funding bodies can operate at regional, national, or European levels, offering a variety of funding programs and calls.
- **Stakeholders:** This category encompasses a wide range of actors, from small and medium-sized enterprises (SMEs) to large companies, as well as RTOs and universities. Stakeholders bring their technical expertise, needs, market access to ensure the commercial viability of innovative projects and accelerating their time-to-market.

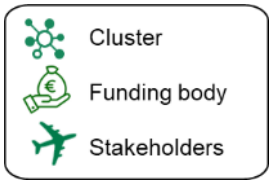


Figure 3: ECARE key type of stakeholders

The implementation process typically has to be started by representatives of an aeronautical region/country which aims to improve the aeronautical industry in their location and would like to gain advantages by establishing synergies. **The following scheme briefly outlines the phases which make up the pathway to synergies:**

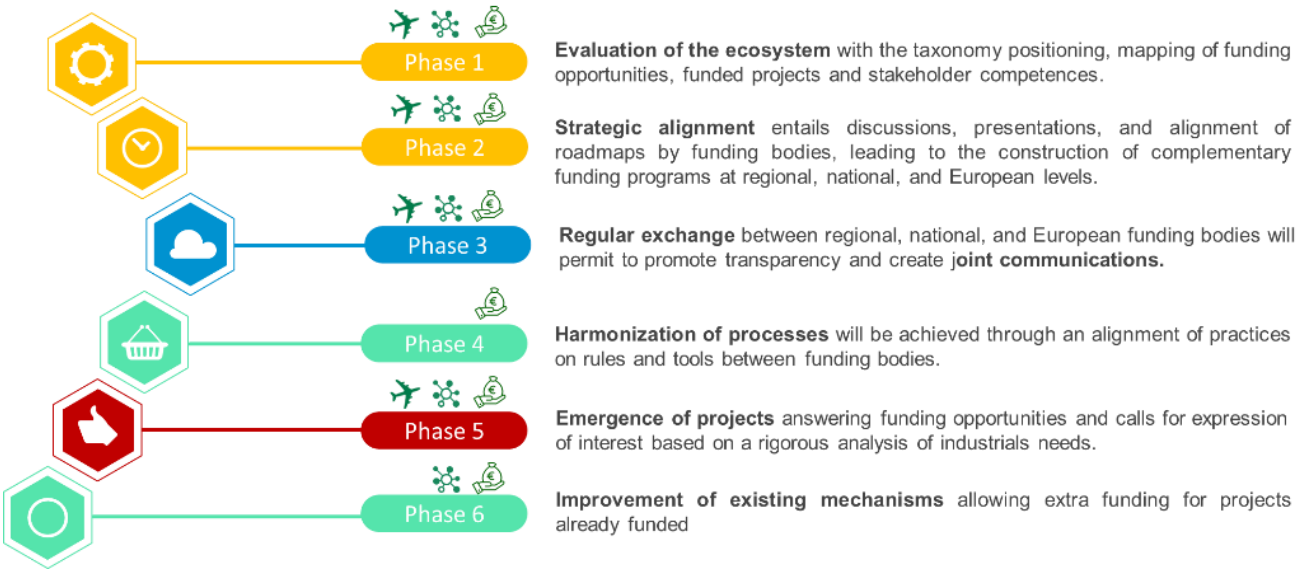
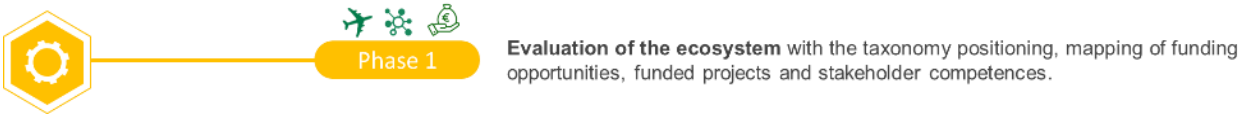


Figure 4: The ECARE Pathway to implement synergies

The next sections will detail each phase, outlining the process to be followed and identifying which stakeholders have to be involved in the process to successfully complete the described path. In the description, references to specific synergy mechanisms are made, which are further described in section 4. In addition to these synergies, the ECARE consortium has developed several tools to facilitate the implementation of these synergies, as detailed in section 5.

3.1 Phase 1 – Evaluation of the ecosystem



The first phase in implementing synergies is to evaluate the ecosystem, which involves analysing the aeronautic industry's landscape. Firstly, it is important to identify the regional and/or national funding bodies that are active in aeronautics innovation and technology development, followed by a comprehensive analysis of their funding programs to understand available support mechanisms. A critical component of this evaluation is mapping all relevant stakeholders, including SMEs, intermediate-sized enterprises, large companies, RTOs, and research institutions, and assessing their technical competencies. This stakeholder mapping provides a clear picture of the region's/country's strengths and capabilities, helping to identify potential areas for collaboration and ensuring that all key players are well-positioned to benefit from and contribute to the synergies created.

Engaging these diverse participants is essential, as each brings unique expertise, resources, and perspectives that contribute to the success of collaborative initiatives. The process of identifying stakeholders and funding bodies should prioritize those who are likely to actively support and benefit from the synergies.

Typically, the initiator of this process is a regional or national funding authority aiming to establish synergies. In the following discussion, the initiator will be referred to as "region," although it is also possible for a national state to follow this process.

To carry out the ecosystem evaluation, regional representatives can either conduct the process independently or collaborate with a cluster. It is crucial to identify the stakeholders within the region who are willing to participate in this process and who are interested in benefiting from the synergies.

Implementation pathway:

1. **To start, the region should identify representatives which are the spokespersons and responsible for the identification of potential synergies**. Representatives for innovation funding should also be involved. If necessary, the region can identify clusters or other organisations with expertise in aeronautics to support them in the process.
2. **Gather data on funded projects** from the past five years, available **funding opportunities** in the region, and **competences of local stakeholders**. **The use of the ECARE taxonomy mapping tool is recommended as a sort of measuring system** to categorize this information and create a comprehensive ecosystem map.
3. **Upload the gathered data to the The ECARE Digital** Platform: A complete tool **(See section 5.3)** to ensure it is accessible to the region and its stakeholders, with the option to update the information as needed. This also allows representatives from Clean Aviation to access relevant regional data
4. **If an innovation roadmap already exists in the region, assess whether the aeronautics industry is adequately included and update it if necessary**. If no innovation roadmap exists, consider developing one in collaboration with local stakeholders by using the ECARE taxonomy tool (see section 5.2), or at least set priorities that can be incorporated into a joint roadmap later in the process. This phase serves as preparation for the next phase.

Best Practice Example:

The ECARE partners conducted a mapping with the ECARE taxonomy tool for the four pilot regions of the project, providing an overview of their regional strategies, funding programs, and stakeholder competencies, all linked to their positioning on ECARE taxonomy topics. Beyond utilizing data available at the cluster level, local stakeholders were engaged to gather information on funded projects from the past five years, with additional stakeholders' competencies identified through cluster memberships. These mappings are accessible in D2.1 and on the ECARE Digital Platform, establishing a foundation for collaboration with Clean Aviation and serving as valuable references for other regions aiming to build similar synergies.

ECARE Kit:

For this phase, the ECARE consortium encourages readers to explore the synergy mechanism proposed below, and to focus on the detailed guidelines, paying particular attention to the recommendations provided in section 4. The ECARE Digital Platform can be used to map the funding opportunities, funded projects and stakeholders' competences, linking all this to the ECARE taxonomy as a common language facilitating the creation of synergies. The consortium also developed the ECARE taxonomy tool to help funding authorities map key priorities and technical competencies, providing a structured foundation for presenting an innovation roadmap. ECARE offers the following set of tools that can support this phase and are more detailed in section 5.

ECARE synergies	ECARE toolbox
Synergy D - Centralized tool which visualizes data of calls, funded projects and stakeholder competences at regional, national and European level	The ECARE taxonomy: a common language for the aviation sector The ECARE taxonomy tool: To identify technical priorities The ECARE Digital Platform: A complete tool

3.2 Phase 2 - Strategic alignment

Strategic alignment entails discussions, presentations, and alignment of roadmaps by funding bodies, leading to the construction of complementary funding programs at regional, national, and European levels.

After evaluating the ecosystem, the next phase of synergy implementation is the strategic alignment of the funding bodies. It involves a multi-faceted approach to harmonize their goals and objectives.

In this phase, industrial stakeholders play a crucial role by sharing their technological needs and long-term vision, helping to shape priorities that reflect real market demands. **Clusters act as intermediaries, not only gathering input from industry players** but also leveraging their expertise to facilitate collaboration between stakeholders and public authorities. Their experience in orchestrating innovation ecosystems, supporting companies makes them particularly suited for this role. In the case of ECARE, partners have actively collaborated with their respective regions in preparing and signing the Memorandum of Cooperation, defining RIS3 strategies, and ensuring that funding opportunities are tailored to real industry needs. This close involvement strengthens the alignment process, balancing innovation potential with practical industrial challenges.

Funding bodies, in turn, analyse these inputs to enable concrete alignments, fostering the emergence of synergies across regional, national, and European levels. The alignment process itself is based on discussions among funding bodies regarding their respective strategies and roadmaps, aiming to assess and refine priorities, challenges, opportunities, needs, and gaps. If necessary, roadmaps can be adjusted and collectively reviewed to ensure effective coordination and synchronization. An ongoing dialogue among funding bodies should be maintained to continuously improve the alignment process. By following this approach, funding bodies can develop and implement coherent and complementary roadmaps that maximize funding impact and drive strategic goals.

The ultimate objective of strategic alignment is to harmonize processes (Step 4) and support the emergence of new projects (Step 5) through joint or complementary funding initiatives.

Implementation pathway:

1. **Identify and convene funding bodies**: Bring together key representatives from the different funding bodies to establish a working group for strategic alignment. Ideally, the representatives which evaluated the ecosystem in phase 1 can be involved.

2. **Industry feedbacks:** Industrial stakeholders provide input on their technological needs and long-term vision to help shape funding priorities aligned with market demands and trends, while clusters act as intermediaries, collecting these insights and conveying them to funding bodies.

3. **Presentation and discussion of technical roadmaps and strategies**: Each funding body presents its technical roadmap and priorities. After, potential gaps, opportunities for collaboration are discussed.

4. **Alignment of roadmaps:** The roadmaps are reviewed collectively to ensure coordination and synchronization. Each funding bodies adjusts its own roadmap for their proposed initiatives. These roadmaps should align with the overall strategic goals and priorities identified in the discussions. This phase involves aligning timelines, avoiding duplication of efforts, and ensuring complementary actions across different funding bodies.

5. **Introduction of coherence and complementarity within funding programs**: Collaborative frameworks should be established at regional, national, and European levels to exploit the aligned roadmaps. This should create the logical conditions for setting up specific collaborative research projects or shared infrastructure investments. It also ensures that funding programs complement each other, leveraging strengths and addressing gaps within the various roadmaps.

Best Practice Example:

Coordination between Clean Sky JU and Regione Campania. The process of building up the MOU between Regione Campania and Clean Sky 2 JU, and even more the MOC with CAJU, has created the occasion to compare European and regional objectives within respective strategies. The results of this process have been the identification of a list of specific topics of potential common interest to be focused on by both parties in their respective role and actions. Those topics relates both directly to technologies for single aisle commercial aircrafts and to technologies (e.g. electric propulsion engines) for general aviation which are more strategic at regional level but considered important also at European level as pilot development. It is evident that the MOU/MOC signing process represents a relevant element of strategic alignment, which develops to a certain extent in roadmap alignment once the specific calls programmes are defined.

The City of Hamburg exemplifies effective alignment with Clean Aviation through its proactive funding initiatives. Between 2024 and 2027, the Hamburg will mobilize up to €128 million in investments to support regional projects, with a continuation of the 'GATE: Green Aviation Technologies' program. The investments align with the Clean Aviation SRIA and its program objectives, as underlined in the MoC between the City of Hamburg and CAJU, signed in 2024.

As of December 2024, 75% of MoC signatories have launched a dedicated funding opportunity or call for interest for their local ecosystem with specific link to CA key technologies.

ECARE Kit:

For this phase, the ECARE consortium encourages readers to explore the synergy mechanism proposed below, and to focus on the detailed guidelines, paying particular attention to the recommendations provided in Section 4. The ECARE taxonomy and taxonomy tool are useful tools for this phase. It acts as a common language for the aviation sector, and can be used to analyse roadmaps and identify common

technical priorities. For the ECARE Digital Platform, it can be utilized to identify and present the roadmaps from different funding bodies. ECARE offers the following set of tools that can support this phase and are more detailed in section 5.

ECARE synergies	ECARE toolbox
Synergy A - Discussion, presentation and alignment of technical roadmaps by funding bodies Synergy B - Development of strategically aligned funding programs at regional, national and European level	The ECARE taxonomy: a common language for the aviation sector The ECARE taxonomy tool: To identify technical priorities The ECARE Digital Platform: A complete tool

3.3 Phase 3 – Regular exchange and joint communications

Regular exchange between regional, national, and European funding bodies will permit to promote transparency and create **joint communications.**

As a key factor for generating synergies between funding bodies, ECARE promotes the establishment of regular meetings and actions among these entities. At least two funding bodies from the same country need to agree on the launch of this action. The frequency and objectives of these meetings should be mutually agreed upon. Key objectives might include identifying actions that could lead to collaborations, such as presentations of funding programs and funded projects, co-funding for projects, joint communications on specific topics, collaboration between funded projects from different funding bodies, joint information days, etc… Funding bodies at the regional, national, and European levels can participate in these meetings and organise joint events to ensure multi-level coordination.

Clusters can also contribute to these regular meetings by sharing field-level insights and the perspectives of local stakeholders. Furthermore, clusters can organize joint events, such as joint information days, and leverage their networks to promote them widely. Companies, while primarily beneficiaries of these actions, can also present their current technical needs during such exchanges, ensuring alignment with industry demands.

After the strategic alignment of the previous phases, the continuity of the collaboration can be ensured through these regular exchanges and actions.

Implementation pathway:

1. **The initial step involves forming a group of at least two funding bodies** that would meet regularly. The frequency and format of these meetings will be defined flexibly based on the specific needs of each group.
2. **Following the establishment of this group and its first meetings**, it would be beneficial for **these entities to organize a first Joint Information Day**. This event should become an annual or biannual occurrence to showcase funding opportunities and highlight their collaboration.
3. **During these Joints Information Days**, funding bodies would encourage their funded projects working on similar topics to collaborate and share public results.

Best Practice Example:

The Consultative Committee in France, a national-level example of successful collaboration is the monthly consultative committee in France. This committee brings together representatives from key funding bodies in the aviation sector, including regional funding body representatives, a representative

for SMEs, and a state representative. The committee reviews projects submitted to the CORAC SME a major SMEs calls at national level, discusses potential co-funding opportunities, and redirects projects to the most relevant funding body when needed.

Also, another example, at regional level in Occitanie (France), a regular meeting is planned between the Regional Council of Occitanie, the Regional Development Agency, DREETS (the state representative in the regions) and Aerospace Valley (a cluster) to share projects in preparation and/or submitted and/or funded within the ASD sectors.

ECARE Kit:

For this phase, the ECARE consortium encourages readers to explore the synergy mechanisms proposed below, and to focus on the detailed guidelines, paying particular attention to the recommendations provided in Section 4. ECARE offers a set of tools detailed in section 5, to support phase 3, the ECARE Digital Platform can be used. Each funding body can integrate their calls and funded projects and the clusters could integrate the stakeholders' competencies. All this data would provide a global clear view of the ecosystem. Additionally, to facilitate the emergence of synergy, a dedicated workspace section can be created by several funding bodies on the ECARE Digital Platform for document exchange and meeting planning.

ECARE synergies

Synergy H - Regular meetings and communication between regional, national and European funding bodies

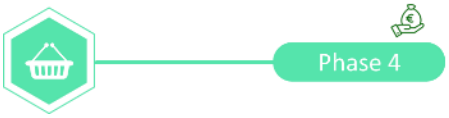
Synergy I - Communication between consortia of projects in different funding programs

Synergy J - Joint information days with different funding bodies

ECARE toolbox

The ECARE Digital Platform: A complete tool

3.4 Phase 4 - Harmonisation of processes



Harmonization of processes will be achieved through an alignment of practices on rules and tools between funding bodies.

The harmonization of processes entails synergies to support the emergence of projects in the next step. It aims to globally improve the funding systems and to standardize and improve the way data are shared. It can be achieved through the alignment of a number of practices, rules, and tools among different funding bodies. This entails standardized applications and review procedures, aligned funding cycles, unified or interoperable IT platform/systems, and the mutual recognition of procedures and reviews. A potential element of harmonization could be the standardization of the reporting formats for funded projects, which can reduce the administrative burden on stakeholders, especially SMEs, while ensuring consistent data collection and evaluation. Key stakeholders to involve in this process could be funding bodies at regional, national, and/or European levels. Harmonizing processes across all these levels is crucial for facilitating stakeholder engagement.

To support the harmonization of processes with data sharing and standardization, it is recommended that funding bodies:

- **Provide data publicly:** Make information about calls and funded projects accessible through their websites with an APIs and/or extractable tables.
- **Adhere to ECARE standards:** Use the standardized data formats defined by ECARE to ensure consistency and compatibility within Europe.
- **Utilize the ECARE Digital Platform:** Integrate their data into the platform to facilitate data sharing and analysis.

Implementation pathway:

Best Practice Example:

Reviewing the current procedures of different funding bodies for application and reporting. Consequently, a unified standardized application which contains elements of the different funding bodies can be developed. It ensures that applications are evaluated consistently together with the guarantee of transparency and accountability. A major aspect is standardization of eligibility criteria such as financial reliability assessment among funding bodies.

Aligning the funding cycles and timelines across different bodies to facilitate better planning and resource allocation. This involves setting similar timelines for application submissions, reviews, and funding decisions.

Establishing a data sharing and standardization framework: Each funding body can develop an API or extractable tables following the standardized data model proposed by ECARE, to facilitate data exchange and ensure data is easily collected.

Implementing a unified IT platform for easier sharing of data (calls, funded projects, and stakeholders' competences at regional, national, and European levels) **and tracking of applications enhancing transparency and comparability** of public funding data for the aeronautics sector. The ECARE digital platform aims to bring this into reality.

An example related to joint calls was the agreement between the ECSEL JU and the Italian Minister of University and Research using the ESIF resources, dated back to 2015-2016. A number of projects were selected and funded, with the Work Breakdown Structure subdivided in two parts, one directly funded by EU via the ECSEL JU and the other funded by the Italian Ministry from the ESIF resources on the basis of the will to harmonise processes at different levels. The scheme was clear; however, the bureaucracy and funding cycles of the two funding entities were significantly different, which complicated the overall management process. It was suggested that improvements could be made if the involved funding bodies agreed to designate a single entity to fully manage the call.

ECARE Kit:

For this phase, the ECARE consortium encourages readers to explore the synergy mechanisms proposed below, and to focus on the detailed guidelines, paying particular attention to the recommendations provided in section 4. In phase 4, the ECARE Digital Platform can be utilized to have a framework of data to homogenise the communicated data at the European level and a joint platform to share the calls and funded projects by different funding bodies, which would centralise all the available information. More details on the ECARE Digital Platform and its functionalities can be found in section 5.3.

ECARE synergies

Synergy C - Standardized criteria of financial reliability assessment

Synergy D - Centralized tool which visualizes data of calls, funded projects and stakeholder competences at regional, national and European level

Synergy E - Extension of the European PIC to all funding levels

Synergy F – Clean Aviation Seal of Excellence

ECARE toolbox

The ECARE Digital Platform: A complete tool

3.5 Phase 5 – Emergence of projects

Emergence of projects answering funding opportunities and calls for expression of interest based on a rigorous analysis of industrials needs.

Phase 5 focuses on the emergence of projects aligned with industry needs based on CA key technologies. An analysis of industrial technical needs should be conducted by funding bodies and clusters within their respective geographical areas in the first phase of the pathway to synergies. This information will be used by funding bodies to construct their calls and by clusters to launch calls for expression of interest. Stakeholders will be invited to respond to these calls to capitalize on available funding opportunities.

It is crucial that funding bodies, clusters, and industrials are involved throughout the entire process. Funding bodies must participate from start to access industrial needs and prioritize funded projects accordingly. Clusters serve as intermediaries, facilitating regular communication between funding bodies and industrials regarding funding opportunities, funded projects, and technical needs. They also foster collaboration, launch and manage specific calls for expression of interest.

Industrials, as the ultimate users of solutions for future aircraft, are essential participants. Their technical needs must be identified, and their feedback sought on proposals, both for calls for expression of interest and standard calls.

Such calls can be implemented either in regions or countries with existing supply chains or those aiming to develop them. Ideally, stakeholders would respond to a call for interest related to CA key technologies. Selected projects would then be submitted to calls issued by funding bodies. This approach prepares the local supply chain for new aircraft technologies in sustainable aviation. Regions or countries seeking to develop their aviation sectors can significantly benefit from launching such calls.

Implementation pathway:

1. **Regardless of the chosen synergy, it is essential to initially engage with local funding bodies (regional and/or national) capable of supporting the projects.** Clusters are key ecosystem players and should be tasked with identifying major industrials in the region working on CAJU key technology. They should also lead the identification of industrial technical needs. ECARE recommends regular interactions with industrials to gather their technical requirements.

2. **Following these exchanges with funding bodies and key industrials, the entity seeking to initiate the project emergence (cluster or funding authority) must determine the appropriate path: a call for interest, a standard call or a combination of both.**

Best Practice Example:

Following the signing of its Memorandum of Cooperation (MoC) with CAJU, the Occitanie Region and Aerospace Valley launched a call for interest focused on CA key technologies, titled "The Green Aircraft Challenge". Managed by Aerospace Valley, the initiative includes the collection of technical needs linked to CAJU technologies and a jury both composed of major industrials such as Airbus, Safran, Thales, Liebherr, and ATR, as well as regional and national funding bodies. This collaborative approach allows for global and comprehensive project evaluation. The call serves as a pilot initiative to implement synergies within the ECARE framework for regions with MoCs.

Additionally, a similar call for interest was launched in Nouvelle-Aquitaine, despite the region not being an MoC signatory. A joint review process was conducted for both regions. The call for interest generated over 30 project submissions from various stakeholders. Following a jury review, the first selected projects were granted the opportunity to respond to specific calls identified and validated by funding bodies.

Coordinated calls between Clean Sky JU and Regione Campania. On the basis of the signed MOU, specific regional calls were issued on topics clearly connected to both the regional RIS3 and Clean Sky priority programme topics, including a score prise for those proposals already presented at European level and awarded a Seal of Excellence.

Several bilateral funding mechanisms exist to support international collaboration in innovation, particularly in aerospace. France and Germany also cooperate through the Bpifrance-ZIM call, which financially supports innovation partnerships between companies from both nations. Similarly, Italy has long-standing bilateral agreements with countries like Israel, Canada, Vietnam, Korea, and Egypt, enabling annual joint calls where each country funds its own participants under a jointly managed framework.

ECARE Kit:

For this phase, the ECARE consortium encourages readers to explore the synergy mechanisms proposed below, and to focus on the detailed guidelines, paying particular attention to the recommendations provided in section 4. Additionally, ECARE provides a specialized tool to support and streamline the creation of effective synergies in this phase: the ECARE Digital Platform, detailed further in section 5.3. This platform includes features such as the ECARE taxonomy for classifying funding opportunities, funded projects, and stakeholder competencies; a mapping tool to identify potential partners; and a workgroup function to facilitate consortium creation and foster synergies among funding bodies. Another key tool, the ECARE taxonomy tool, enables funding bodies to position themselves within the taxonomy, identify technical priorities, and communicate related actions and funding opportunities.

ECARE synergies

Synergy K - Specific calls at regional and/or national level coherent with Clean Aviation key technologies

Synergy L - Cluster issuing a call of interest to initiate projects linked to Clean Aviation key technologies

Synergy M - Simultaneous calls for interest in different countries for Eureka-Eurostars projects linked to Clean Aviation key technologies

Synergy N - Unified collaborative aeronautics funding

Synergy O - Clean Aviation cascade funding

Synergy P - Aeronautical IPCEI

Synergy Q – Joint call on Clean Aviation key technologies

Synergy R – Clean Aviation open call for SMEs

ECARE toolbox

The ECARE taxonomy: a common language for the aviation sector

The ECARE taxonomy tool: To identify technical priorities

The ECARE Digital Platform: A complete tool

3.6 Phase 6 - Improvement of existing mechanisms

Improvement of existing mechanisms allowing extra funding for projects already funded

In addition to the new funding opportunities emerging in the previous phase, the last phase to implement synergies is the establishment of structures to provide additional funding for a selected number of already evaluated projects. With the suggested synergies, additional opportunities for funding are offered alongside existing funding programs. The initiators of this phase are funding bodies at the three different levels, depending on the mechanisms. The beneficiaries of these synergies are entities or consortia which have developed an excellent project idea with a proposal, and are either looking for funding after having been rejected, or are looking for additional funding to continue the project.

Implementation pathway:

1. **The initiator of this synergy has to identify the key stakeholders to be involved.** For example, funding bodies from a region which has signed an MoC could reach out to Clean Aviation to introduce the Seal of Excellence with their region.

2. **Once the stakeholders have agreed to introduce the synergy**, experts from both funding bodies should collaboratively define a set of core criteria that will be universally accepted. **A standardized evaluation process to be adopted by all participating funding bodies has to be introduced.**

3. **When the Seal of Excellence has been finalized, it can be awarded by the funding bodies to two types of projects**: Either projects which have been positively evaluated but were not able to receive funding, or projects which have been successfully funded and are looking for continuous funding. **Once the project has received the SoE, it could apply for the CAJU Plug-In scheme and the CAJU Open Call to receive funding from Clean Aviation**.

Best Practice Example:

In a number of European countries, Seal of Excellence Mechanisms have been introduced by national funding bodies for projects which have received a SoE by the European Innovation Council (EIC). For example, Bulgaria has implemented a national scheme to support innovative SMEs that received the Seal of Excellence from the EIC under H2020 and Horizon Europe. Managed by the Ministry of Innovation and Growth, the scheme was launched under the Recovery and Resilience Plan, with application deadlines in April 2023 and early 2024. Additionally, from 2024, similar support will be provided under the ERDF program 'Research, Innovation and Digitalization for Smart Transformation' 2021-2027, with a total allocation of €50 million, ensuring ongoing assistance for these high-quality projects[18].

However, no upstream SoE mechanism is currently in place, meaning no SoE awarded by regions or countries have been similarly recognized on European level with the option to provide additional funding.

ECARE Kit:

For this phase, the ECARE consortium encourages readers to explore the synergy mechanism proposed below, and to focus on the detailed guidelines, paying particular attention to the recommendations provided in Section 4. Additionally, ECARE provides a specialized tool to support and streamline the creation of effective synergies in this phase, the ECARE Digital Platform, detailed further in Section 5.3. The ECARE Digital platform could be used to present the projects which has been awarded with an SoE, and stakeholders could be informed about openings of new funding opportunities.

ECARE synergies	**ECARE toolbox**
Synergy F – Clean Aviation Seal of Excellence Synergy G – Clean Aviation Plug-In scheme for SMEs Synergy R – Clean Aviation open call for SMEs	The ECARE Digital Platform: A complete tool

[18] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/seal-excellence/eic-seal-excellence-opportunities_en , last accessed 29th of October 2024

3.7 Successful implementation of synergies – The ECARE pilot regions examples

The ECARE project has successfully fostered collaboration and synergy among various stakeholders within the aeronautics sector. This section delves into specific examples from the pilot regions of Occitanie, Nouvelle-Aquitaine, Hamburg and Campania, highlighting the effective implementation of partnerships and initiatives to support sustainable aviation development.

3.7.1 Occitanie & Nouvelle Aquitaine

The Occitanie region maintains a close partnership with Aerospace Valley for many years now as an active member of the aeronautical ecosystem, with regular exchanges. In February 2023, the region joined the ECARE Stakeholder Group to actively participate in the project and replicate its results.

During the first ECARE National Workshop in France in May 2023, the region advocated for more aviation projects to be funded. While creating an additional dedicated aviation call was considered challenging, participants agreed that leveraging existing funding programs would be the most effective approach.

In June 2023, Occitanie signed an MoC with CAJU to establish a strategic partnership for sustainable aviation and maximize synergies between funding bodies. The MoC aimed to use existing programs, stimulate new calls and/or calls for expression of interest and develop joint technical roadmaps to identify specific mechanisms to activate some synergies linked to CAJU objectives.

Following the NWS discussion and MoC signing, the parties explored ways to emerge CA-related projects. A call for interest led by Aerospace Valley was proposed and approved called the “Green Aircraft challenge”. The joint ECARE NWS and MoC efforts have shown that detailed discussions with funders can foster actions to benefit the aeronautics ecosystem.

By launching a call of interest, Aerospace valley aims to mobilise its members on technical challenges co-built with major OEM and help SMEs and laboratories to design innovative projects.

As a first step, Aerospace Valley reached out to key aviation industrials in Occitanie, including Airbus, ATR, Safran, Thales, and Liebherr, to gather their technical needs for inclusion in the call specifications. These entities subsequently joined the jury for the second stage of the call: company pitches. The jury also includes representatives from funding bodies, facilitating discussions on potential co-funding.

Following the finalization of call specifications (deadline, eligible entities, selection criteria, etc.), **Aerospace Valley, the Occitanie region, the DGAC** (France's leading national aviation funding body), **and CAJU organised a joint information day** on February 9, 2024, in Toulouse. Funding bodies collaboratively presented their roadmaps and calls, while Aerospace Valley emphasized the Green Aircraft Challenge specifications. Industries showcased their technical needs, enabling stakeholders to ask questions and assess project alignment.

Following this event, stakeholders submitted projects by March 7, 2024. Aerospace Valley, with its technical experts, pre-selected proposals. Subsequently, the jury of industrials and funding bodies evaluated stakeholders based on their pitches, and selected projects were then directed to the identified funding opportunities.

Encouraged by the success of the first round, Aerospace Valley organized a second call for interest with Occitanie and Nouvelle Aquitaine. Industrials in Nouvelle Aquitaine were contacted to gather their technical needs, and call specifications were reviewed and validated with the regions. A second joint information day, held on May 27, 2024, in partnership with the region Nouvelle-Aquitaine and Occitanie, DGAC, and CAJU, garnered significant interest and participation. This effort resulted in numerous project

submissions by the June 17 deadline, with pitch presentations by the selected projects scheduled for September 2024 in front of key industrial.

These calls for expression of interest yielded 33 applications, resulting in the selection of 12 projects. During the first cut-off in February 2024, 10 applications were received, with 2 projects selected. The second cut-off in June 2024 saw 23 applications, leading to the selection of 10 projects. Of the 12 selected projects, 2 have applied for funding through regional programs, 1 through national programs, and 9 are currently in the process of consolidating their applications.

A key outcome of the "Green Aircraft Challenge" was the successful collaboration between funding bodies, which facilitated a joint information day to showcase roadmaps and calls and provided a place for discussing projects and potential co-funding opportunities. Notably, Nouvelle-Aquitaine's has not signed an MoC, it underscores the feasibility of launching such initiatives in regions without MoC. The call aimed to prepare the supply chain for emerging technologies by engaging SMEs in their development, leveraging regional and/or national funding. This approach positions these SMEs as potential partners for large companies in future CA Phase 2 calls.

3.7.2 Campania

The Campania Region is a signatory of the MOU with Clean Sky JU since years, and was the first European region signing the MOC with Clean Aviation JU. One of the main objectives of these agreements was to find the way to coordinate the actions for a better and more effective support to the development of industrial R&D activities towards the European agreed targets.

During the implementation of the signed MOU between Clean Sky 2 JU and Regione Campania, specific regional calls were issued on topics clearly connected to both the regional RIS3 and Clean Sky priority programme topics, including a score prize for those proposals already presented at European level and awarded a Seal of Excellence. Furthermore, for other regional calls of a more general nature but including aeronautics, Campania Region clearly indicated the priority of those topics or proposals in line with the RIS3 and Clean Sky / Clean Aviation strategies.

It has also to be underlined that the technical annex to the existing MoC identifies some topics oriented to the regional strong interest on General and Business Aviation which have been identified as small-scale pilot activities also of interest of larger civil aviation aircraft. An example is the electric motor system driving a propeller. This is another important example of synergies on both strategic directions and specific products.

The results of these actions represent certainly very positive steps in the implementation of synergies between the regional and European levels. Considering then the regional RIS3 are built and are checked before authorization taking into account the national strategies, it emerges that synergies among Regione Campania, Italy and EU are already in place and on the way for further developments.

3.7.3 Hamburg

In June 2024, the City of Hamburg signed an MoC with the CAJU, formalizing a partnership that had been in preparation since years and also marked a closer link with the ECARE project[19].

Hamburg is the third-largest civil aviation site globally, with more than 40,000 employees working in around 300 different aviation companies and institutions. To bolster the industry and support the sustainable development, the Hamburg Ministry of Economic Affairs and Innovation introduced the 'GATE: Green Aviation Technologies' funding program in 2021. This initiative was designed to enhance the

[19] https://www.hamburg-aviation.de/en/detail/details/news/hamburg-and-the-clean-aviation-joint-undertaking-set-strategic-cooperation-to-accelerate-innovation.html, last accessed 29th of October 2024

innovative capacity of SMEs and research institutions, with a focus on developing technologies and processes that reduce the aviation industry's environmental footprint. Through this program, six projects received a total of four million Euros in funding[20].

Building on the success of the GATE program, the Hamburg Ministry of Economic Affairs and Innovation decided to further accelerate the development of sustainable aviation technologies. Between 2024 and 2027, **the City of Hamburg plans to mobilize up to €128 million in investments to support regional projects, aligning with the Clean Aviation's SRIA and its program objectives.** The first step in this initiative was the continuation of the GATE program. In May 2024, a new edition of the successful funding program was announced. With a focus on SMEs, GATE II supports Hamburg-based suppliers and engineering service providers in developing new, environmentally friendly concepts, technologies, and products, offering individual funding of up to €500,000 and up to €2 million for joint projects. The selected projects are set to commence at the end of 2024[21].

For both the collaboration with the Clean Aviation, as well as the development and promotion of GATE II, the cluster Hamburg Aviation supported the City of Hamburg. For example, a workshop to pitch project ideas and find potential consortium partners was organized after the launch of the call for proposals.

[20] https://www.ifbhh.de/presse/meldung/hamburg-stellt-projekte-fuer-nachhaltigere-luftfahrt-vor, last accessed 29th of October 2024

[21] https://www.hamburg-aviation.de/detail/details/news/gate-ii-hamburgs-foerderprogramm-fuer-nachhaltige-luftfahrt-geht-in-die-zweite-runde.html, last accessed 29th of October 2024

4. ECARE synergies mechanisms and recommendations

To support the pathway to synergies detailed in the previous chapter, ECARE developed 18 synergy mechanisms to enhance collaboration, streamline processes, and optimize resource allocation. This chapter outlines the key synergy mechanisms in detail, including strengths and limits, policy considerations, necessary actors to be involved and the main steps to follow when implementing the synergy. The synergies are listed in the table below.

Table 1: ECARE synergies

N°	#	Grouping	Description
1	Synergy A	Strategic alignment	Discussion, presentation and alignment of technical roadmaps by funding bodies
2	Synergy B	Strategic alignment	Development of strategically aligned funding programs at regional, national and European level
3	Synergy C	Strategic alignment	Standardized criteria of financial reliability assessment
4	Synergy D	Harmonisation of processes	Centralized tool which visualizes data of calls, funded projects and stakeholder competences at regional, national and European level
5	Synergy E	Harmonisation of processes	Extension of the European PIC to all funding levels
6	Synergy F	Harmonisation of processes	Clean Aviation Seal of Excellence
7	Synergy G	Harmonisation of processes	Clean Aviation Plug-In scheme for SMEs
8	Synergy H	Communication & transparency	Regular meetings and communication between regional, national and European funding bodies
9	Synergy I	Communication & transparency	Communication between consortia of projects in different funding programs
10	Synergy J	Communication & transparency	Joint information days with different funding bodies
11	Synergy K	Emerging funding opportunities	Specific calls at regional and/or national level coherent with Clean Aviation key technologies
12	Synergy L	Emerging funding opportunities	Cluster issuing a call of interest to initiate projects linked to Clean Aviation key technologies
13	Synergy M	Emerging funding opportunities	Simultaneous calls for interest in different countries for Eurostars projects linked to Clean Aviation key technologies
14	Synergy N	Emerging funding opportunities	Unified collaborative aeronautics funding

15	Synergy O	Emerging funding opportunities	Clean Aviation Cascade funding
16	Synergy P	Emerging funding opportunities	Aeronautical IPCEI
17	Synergy Q	Emerging funding opportunities	Joint call on Clean Aviation key technologies
18	Synergy R	Emerging funding opportunities	Clean Aviation open call for SMEs

The consortium included dedicated recommendations for each synergy. The recommendations are based on the previous work done in the project, including interviews with industrials, regional aeronautic stakeholders, ECARE Stakeholder Group meetings, two national workshops in the three pilot countries and a transnational workshop. In this way, the consortium was able to include the perspectives of different stakeholders when deciding on which synergies to propose, and how to implement them.

4.1 Synergy A - Discussion, presentation and alignment of technical roadmaps by funding bodies

N°	#	Grouping	Title
1	Synergy A	Strategic alignment	Discussion, presentation and alignment of technical roadmaps by funding bodies

Description:
To create synergies in public funding, the funding bodies first need to align their technical roadmaps. Technical roadmaps serve as a strategic planning tool that outlines the development, implementation, and evolution of technologies. As funding programs in aeronautics are usually based on roadmaps, the foundation of synergies between funding bodies is the alignment of roadmaps. If there is no roadmap currently available, it should be developed at the regional or national level, or, even better, it can be jointly developed with the European funding body, local aeronautic stakeholders should be involved in this process. The format used to set up technical roadmaps, should preferably be standardized.

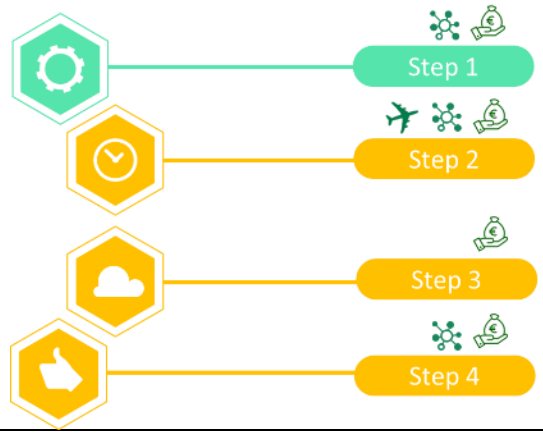
Strengths:
- Improved knowledge sharing and global coordination
- Strategic alignment of funding with industry and research needs
- Enhanced transparency and accountability
- Promotion of collaboration among stakeholders
- Streamlined research efforts through coordinated timelines and topics

Limits:
- Time and resource constraints
- Alignment challenges between different funding bodies

Policy considerations:
- Data standardization: Developing standardized formats for technical roadmaps to facilitate comparison and analysis during workshops.
- Confidentiality agreements: Establishing clear protocols for data sharing and confidentiality

Necessary actors to be involved:
- Regional, national and European funding bodies

Main steps in the process:



Preparation: Develop a standardized format for technical roadmaps for the presentation, discussion and analysis process, including objectives, technical priorities, budget allocation, timelines, and participation guidelines.

Data collection: Gather technical roadmaps from all relevant funding bodies and funding programmes without technical roadmaps, with the involvement of local stakeholders in the aeronautic industry.

Analysis and discussion: Organize meetings for funding bodies to present their roadmaps and/or funding programmes, identify potential synergies and gaps, and discuss opportunities for collaboration.

Alignment and action planning: Develop a joint roadmap outlining concrete steps to be taken by different stakeholders to achieve the agreed-upon goals.

ECARE recommendations

Each funding body should initially complete a standardized format for technical roadmaps, with further refinement through collaborative workshops to create country-specific formats aligned with European roadmaps and RIS3 strategies. These roadmaps should include both aeronautic technology and necessary infrastructure. The ECARE consortium recommends leveraging the ECARE taxonomy tool to draft initial technical roadmaps. This tool enables funding bodies to provide data and information on each technical topic, as detailed in section 5.2.

The selected standardized format should be decided through meetings involving multiple stakeholders. **It is recommended to ensure alignment on the scope of funded technologies while recognizing specific differences. A shared workspace on the ECARE Digital Platform (EDP) can be utilized for roadmap alignment.**

To ensure effective coordination, regular meetings should be organized: annual meetings between the Clean Aviation Joint Undertaking (CAJU) and regional/national funding bodies, and semi-annual meetings between regional and national funding bodies. The meetings on European level can be initiated by the national funding body, coordinating with both the regional funding bodies and CAJU.

Additionally, a dedicated event for MoC signatories "the MoC Forum" is proposed to facilitate updates on roadmap status, encourage collaboration among MoC signatories, and promote alignment across regions and countries with CAJU's objectives. This forum would serve as a platform to enhance synergy and strategic coordination in the aeronautics sector.

4.2 Synergy B - Development of strategically aligned funding programs at regional, national and European level

2	Synergy B	Strategic alignment	Development of strategically aligned funding programs at regional, national and European level

Description:
This synergy seeks to ensure that public funding programs at regional, national, and European levels are coherent and complementary, creating a unified approach to technology development.

After the initial strategic alignment based on technical roadmaps, funding programs are designed to provide continuous Technology Readiness Level (TRL) coverage for specific technical topics, while also ensuring comprehensive support across all relevant technologies. This coordinated approach allows beneficiaries to progress on a specific technology from its initial stages to full maturation through successive project phases, each funded by different bodies at regional, national, or European levels.

Importantly, while the synergy aligns the various funding programs, each funding body maintains its autonomy, funding projects individually without the need for joint funding arrangements.

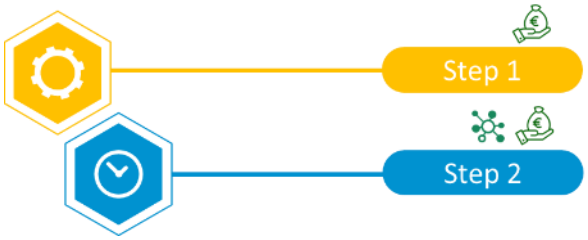
Strengths:
- Avoiding uncontrolled superposition of funds on specific topics, focusing on the same TRLs in the same time-frame
- Possibility for beneficiaries to develop their technology along the different maturation levels with successive funding phases already identified.

Limits:
- Difficulties to align the regional and national interests with the European interests
- The regulatory framework could block the implementation due to different eligible costs, expenditure base, etc.

Policy considerations:
- IPR management: IPR aspects may become relevant especially in the project phases with higher TRL to protect the interest of all stakeholders

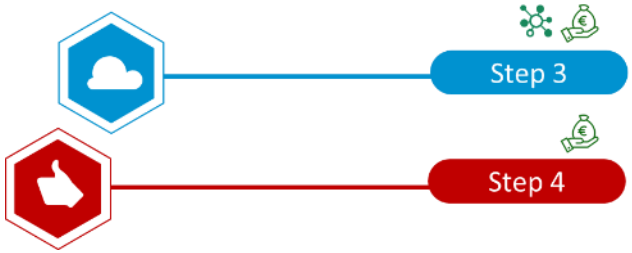
Necessary actors to be involved:
- Regional, national and European funding bodies

Main steps in the process:



Preparation: After the alignment of technical roadmaps, all funding bodies come together to underline their targeted technologies and specific competences. Based on the chosen technical topics, funding bodies design funding programs and calls that complement each other in terms of TRL coverage.

Launch of the funding programs/calls: Each funding program individually introduces its funding program and publishes the call for proposals.



Communication and implementation: Funding bodies set up a regular communication channel to ensure transparency and exchange information during the call launch and the project selection. Before selecting the funded projects, a meeting is organised to discuss the proposals with the other funding bodies.

Project execution: Projects progress through successive funding phases at different levels as their technology matures. They have the option to continuously apply for funding on different levels until the technology reaches maturity.

ECARE recommendations

ECARE recommends that funding bodies agree on their respective TRL to fund during the construction of funding programs, ensuring a coordinated approach. Funding bodies should also explore regulatory adjustments to harmonize practices related to high TRL funding, eligible costs, and budgets. Drawing inspiration from past collaborations, such as the development of the A350, **a unified response to climate change challenges should be prioritized, with all funding bodies working on specific development programs**.

The success of this synergy relies on transparent and regular communication among all stakeholders, facilitated through a coordination and consultation mechanism during the roadmap construction and call preparation phases. This synergy should respect the diverse interests of regional, national, and EU levels, which are already aligned through established strategic planning processes.

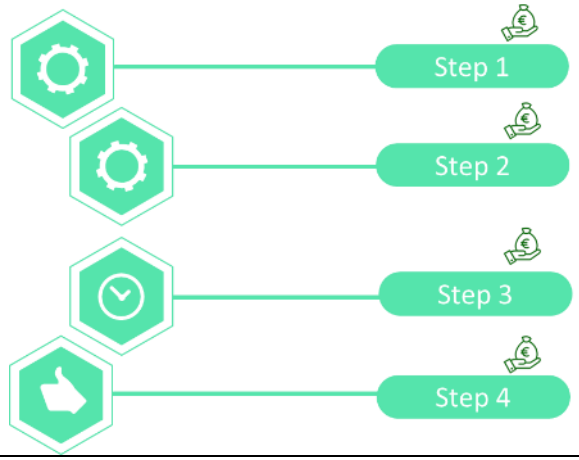
4.3 Synergy C - Standardized criteria of financial reliability assessment

3	Synergy C	Harmonisation of processes	Standardized criteria of financial reliability assessment

Description:
This synergy involves the creation of a unified set of measures to evaluate an organization's financial stability and its ability to meet financial obligations. By standardizing these criteria across different funding bodies, this approach aims to enhance decision-making, increase accountability, and improve transparency in the public funding process. It also helps to consistently identify and evaluate organizations receiving public funds. Currently, each funding body employs different methods for calculating available equity and determining the required documentation for financial capability analysis. This synergy seeks to harmonize these processes, ensuring a more reliable and efficient assessment framework across all levels of funding.

Strengths:	Limits:
• Enhanced decision-making processes • Increased accountability and transparency • Identification of organizations receiving public funds • Reduction of risk for funding bodies	• Potential resistance of funding bodies to change from established practices • Challenges in harmonizing criteria across diverse funding bodies and jurisdictions in different countries • Less flexibility of funding bodies to adapt criteria individually
Policy considerations: • Alignment with existing financial regulations and standards, to be confirmed with legal advisors • Adaptability to evolving economic and financial landscapes	**Necessary actors to be involved:** • Regional, national and European funding bodies • Legal advisors for financial regulations and compliance (country-specific and international/European)

Main steps in the process:



Preparation: Identification of key financial metrics and development of standardized criteria together with all funding bodies

Confirmation: Seek legal advice to confirm the criteria

Testing: Implement the standardized criteria in pilot projects and gather feedback from stakeholders to refine the assessment process

Implementation: Integration of the standardized criteria into future calls on all three levels

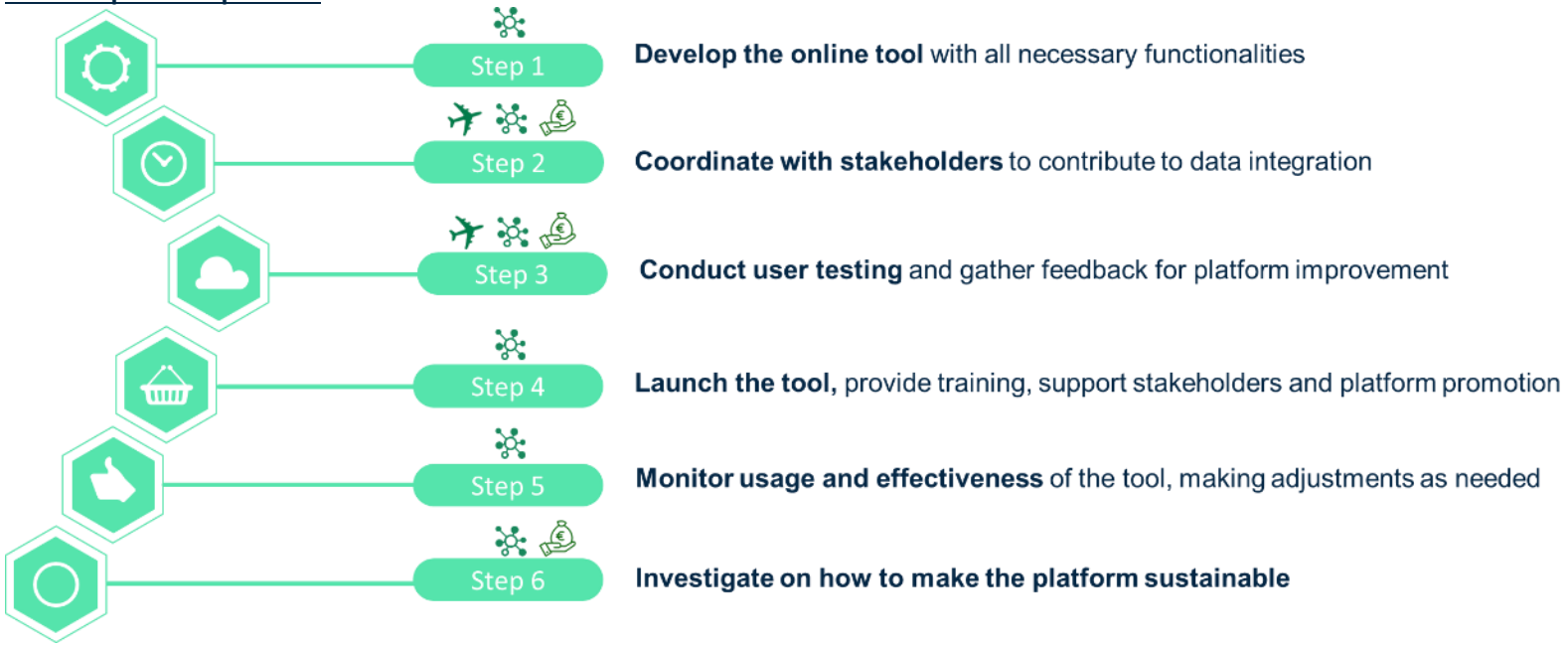
ECARE recommendations:
It is recommended to first review and harmonize regulations at the national level by the national funding bodies, then at the regional level with the regional funding bodies. After this step alignment with EU standards at both regional and national levels. **The countries and regions under Memorandum of Cooperation (MoC) could serve as pilot regions to test these standardized criteria**, potentially developed jointly with Clean Aviation.

Key factors for success include securing agreement among funding bodies on the necessary financial requirements, achieving consensus on the standardized criteria and assessment methods, and conducting regular evaluations to refine the criteria based on feedback and practical experience.

4.4 Synergy D - Centralized tool which visualizes data of calls, funded projects and stakeholder competences at regional, national and European level

<table>
<tr><th>4</th><th>Synergy D</th><th>Harmonisation of processes</th><th colspan="2">Centralized tool which visualizes data of calls, funded projects and stakeholder competences at regional, national and European level</th></tr>
<tr><td colspan="5">Description:
This synergy aims to enhance transparency and comparability of data concerning public funding for the green transition of the aeronautics sector by establishing a unified platform. The platform will visualize data of calls, funded projects, and stakeholders' competences at regional, national, and European levels. The ECARE Digital Platform developed by ECARE, aims to bring this synergy into reality by offering the following features:
• Intuitive Search Engine: Navigating effortlessly through an extensive database of funded projects and funding opportunities, tailored by technical topics, keywords, regions, all focused on sustainable aviation.
• European Aeronautical Stakeholder Directory: Searching and connecting with a comprehensive directory of European aeronautical entities, categorized by type (SME, Large company, RTO, etc....) and technical domain of expertise (e.g., Propulsion, Flight physics, Avionics, etc...).
• Collaboration Space: Engaging in meaningful interactions through discussion forums, workgroups, file sharing, and direct messaging, all designed to connect potential partners and enhance collaborative efforts in the aeronautic sector.
• Synergy Resources: A comprehensive synergy guide with an evolving repository of practical materials and completed projects, all aimed at enhancing the ability to create and manage effective synergies within the aeronautics sector.
As a key functionality, an ECARE AI tool has been developed to enable the automatic translation of original texts. Additionally, ECARE taxonomy topics are automatically selected based on the description of the call, project, or stakeholder, ensuring accurate and efficient categorization.</td></tr>
<tr><td colspan="3">Strengths:
• Enhanced transparency and comparability of funding data
• Increased awareness of funding opportunities and visibility of funding landscapes
• Improved communication and collaboration between stakeholders
• Facilitation of project partners search
• User-friendly interface with intuitive visualization tools
• ECARE AI tools enable automatic text translation and taxonomy topic selection</td><td colspan="2">Limits:
• Challenges in data integration and standardization: Lack of options to upload data automatically due to no availability of public API, limited capacities of stakeholders to enter the data manually
• Difficulties to verify the uploaded data and keep it up to date
• Limited resources for platform development and maintenance</td></tr>
<tr><td colspan="3">Policy considerations:
• Compliance with data protection and privacy regulations</td><td colspan="2">Necessary actors to be involved:
• Developers to create and maintain the digital platform
• Regional, national and European funding bodies
• Aeronautical stakeholders
• Clusters and business networks</td></tr>
</table>

Main steps in the process:



ECARE recommendations:

The ECARE consortium invite all stakeholders to create an account on the ECARE Digital Platform at this address:

https://ecare-digital-platform.eu/user/register

It is recommended that each funding body provides data yearly on their calls and funded projects through their website, via an API, or by supplying extractable tables, enabling the ECARE Digital Platform to access and compile this data. The ECARE Digital Platform supports bulk data uploads at the admin level, please contact ECARE IT manager here to launch the process. The data shared should be standardized according to ECARE propositions, outlined on the ECARE Digital Platform, which specifies the global standardized data to be procured for calls, funded projects, and stakeholders' competences. If automatic data integration via an API is not feasible or providing all the required data is challenging, stakeholders can manually enter a reduced set of key information on the EDP or inside a specific Excel file, in accordance with the standardized data defined by ECARE. This simplified data submission option is outlined in the table below.

Table 2: ECARE minimum set of data to provide for funding opportunities

Full title	Description	Funding body & Funding program name	Starting year	Coordinator	Participants	Project type (European, National or Regional)	"Country

ECARE encouraged clusters to integrate the technical competences of all their members into the EDP and actively invite them to register and utilize the platform. To facilitate this integration, clusters are advised to complete an Excel file requiring only a minimal amount of data (see table below). Once the initial integration is complete, ECARE recommends updating the information annually to include new cluster members and ensure the data remains current.

Table 3: ECARE minimum set of data to provide for clusters

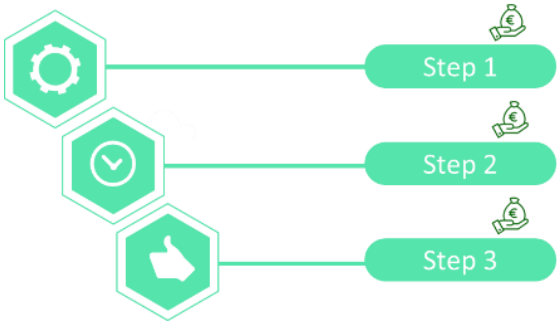
Organisation name	Description	Organisation Type	Region	Email	Organisation address

All entities working on aviation are invited to create an account on the ECARE Digital Platform and integrate their competencies, funded projects and funding opportunities.

The success of this synergy depends on active, long-term participation from various stakeholders, and the comprehensive and reliable integration of data from funding bodies and other stakeholders. It is therefore advised that the national and regional funding bodies continue to work on improving the data supply, using the standardized formats provided by ECARE. After the end of ECARE, the funding bodies could be supported by other initiatives, such as EACP (European Aeronautics Cluster Partnership) and the EEN (Enterprise Europe Network) Aerospace and Defence sector group.

Another CSA related to the topic of data integration and transparency, funded on the European level, could also support the availability and standardization of data on regional and national level. This would enhance the functionality and sustainability of the ECARE Digital Platform.

4.5 Synergy E - Extension of the European PIC to all funding levels

<table>
<tr><th>5</th><th>Synergy E</th><th>Harmonisation of processes</th><th>Extension of the European PIC to all funding levels</th></tr>
<tr><td colspan="4">Description:
The extension of the European Participant Identification Code (PIC) to national and regional funding levels would provide a unique identifier for organizations applying for public funding across the entire European Union, including regional and national calls. The use of a consistent identifier would simplify the life of all stakeholders (funding users and bodies), and enhance transparency and accountability in public funding, ensuring that funding bodies can efficiently monitor the allocation and use of funds while reducing administrative burdens for applicants.</td></tr>
<tr><td colspan="3">Strengths:
• Simplification of actors' identification and search, of competences search and management, of application procedures
• Improved transparency and efficiency with a European registry of all beneficiaries
• Promotion of cross-border cooperation</td><td>Limits:
• Difficulties in integrating the PIC with IT tools used in different regions and countries</td></tr>
<tr><td colspan="3">Policy considerations:
• It is possible that the identifiers of already registered stakeholders cannot be changed. In this case the focus should be done on newly registered stakeholders</td><td>Necessary actors to be involved:
• Regional, national and European funding bodies
• Experts for IT and administration at the three levels</td></tr>
<tr><td colspan="4"><u>Main steps in the process:</u>
 

Define implementation strategy: Develop a detailed plan for integrating the PIC system across all funding levels.
Coordination among funding bodies to ensure alignment of processes and criteria
Adoption of the unique PIC in all new funding calls</td></tr>
<tr><td colspan="4">ECARE recommendations:
Existing regional, national, and European registry systems have different numbering schemes. A potential solution could involve adding a prefix to the European existing PIC based on geographical location (e.g., FR for France and OCC for Occitanie region) to create a personalised unique overall identifier. For future funding calls at national and regional level, stakeholders which already have a European identifier should be able to indicate it and continue to use it for the regional and national calls. For stakeholders which are new to the system, a unique identifier which is the same on all levels should be introduced.</td></tr>
</table>

4.6 Synergy F – Clean Aviation Seal of Excellence

6	Synergy F	Harmonisation of processes	Clean Aviation Seal of Excellence

Description:

This synergy aims to create a recognized Clean Aviation Seal of Excellence[22] (SoE) mechanism across all levels of funding.

The existing EIC Accelerator Seal of Excellence is a quality label awarded to project proposals submitted by start-ups and SMEs under Horizon Europe, the EU's research and innovation funding programme, to help these proposals find alternative funding at regional and/or national level. Projects that were judged to deserve funding by independent experts gathered within EIC juries, but did not get it only due to budget limits, may receive such Seals of Excellence.

The proposed synergy seeks to enhance this existing top-down approach by introducing a bottom-up element, creating a reciprocal system. Under this model, regional and national funding bodies would also award SoE, which would then be recognized by Clean Aviation and especially in the CAJU Open call proposed in Synergy R. Clean Aviation JU would also deliver SoE for projects that have not been selected.

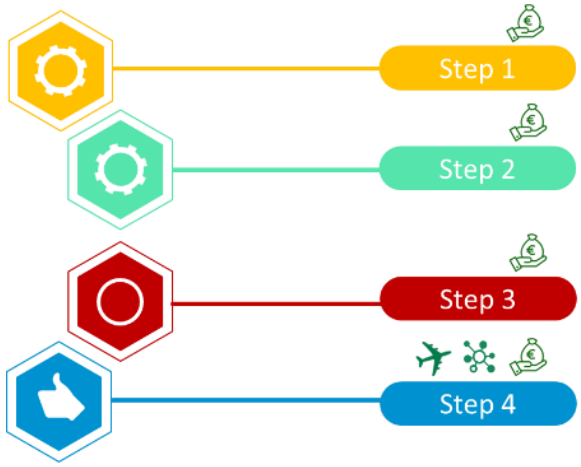
This expanded framework would ensure that projects recognized with a SoE at any level have increased opportunities for additional funding. Consequently, in addition to the regional and national SoE schemes, opportunities for additional funding for SoE proposals on European level would be introduced.

Strengths:	Limits:
• Mutual recognition of project quality standards by all funding bodies • Stimulus for a more complementary and recognized definition of strategic targets/programmes • Reduce administrative efforts for project evaluation	• Difficulties to define the common criteria to assign reciprocally recognized SoE • Willingness of funding bodies to accept a project without their own evaluation
Policy considerations: • EU Regional Policy (Cohesion Policy) • Clean Aviation Policy • State Aid rules. The European Commission simplified the rules for State Aid combined with EU support[23].	**Necessary actors to be involved:** • Regional, national and European funding bodies

[22] https://eic.ec.europa.eu/eic-funding-opportunities/eic-accelerator/seals-excellence_en, last accessed 29th of October 2024

[23] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/seal-excellence/how-can-seal-holders-use-seal-excellence_en, last accessed 29th of October 2024

Main steps in the process:



Development of harmonized criteria: Development of standardized evaluation criteria and processes for awarding the SoE, ensuring consistency and comparability across all levels

Implementation of reciprocal recognition: Establishing agreements for the reciprocal recognition of SoEs, ensuring that an SoE awarded at any level is acknowledged and respected by all participating bodies. Setting up mechanisms for the transfer of evaluation reports and project proposals between funding bodies to facilitate the funding process for SoE-awarded projects.

Integration of additional funding opportunities: Work with Clean Aviation and national/regional funding bodies to create dedicated funding streams or programs for projects with an SoE that were not initially funded.

Publication and communication: Launch a communication campaign to inform potential applicants, funding bodies, and other stakeholders about the expanded SoE mechanism and its benefits.

ECARE recommendations:

A unified evaluation process must be developed with active involvement from regional and national funding bodies to ensure comparability and avoid a purely top-down process. An SoE awarded by any funding body should be automatically recognized by others, allowing these projects to receive priority consideration for funding from key funding bodies in aviation, such as CAJU, other European funding bodies, national funding bodies, and regional bodies. Recognizing the SoE should involve the transfer of the complete proposal and the reviewers' examination report to the relevant funding body.

The implementation of the SoE and its reciprocal acceptance should be promoted and accepted by all funding bodies involved. CAJU should include the SoE in the MoC signature and strategy for the next call for proposals after it has been implemented by the regional and national funding bodies.

Additionally, given the challenges some companies face in securing private funds, the SoE could also be used as a tool to attract private investment. Funding bodies should create links with hedge funds to promote the recognition of it.

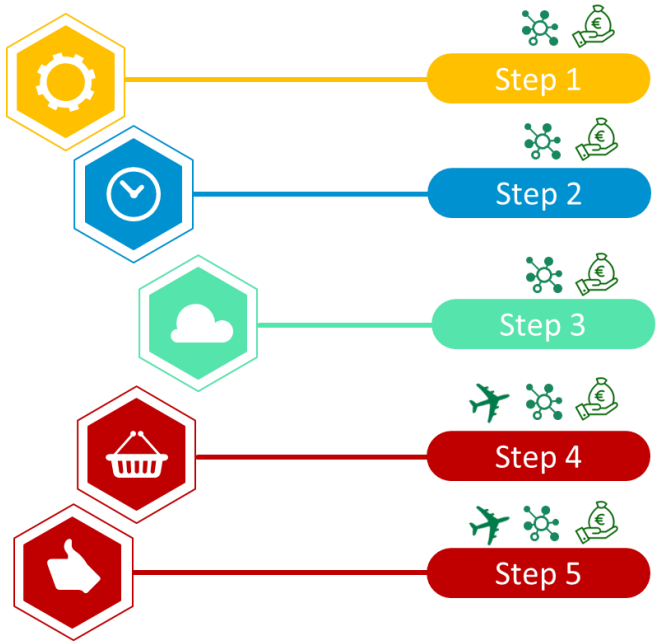
4.7 Synergy G – Clean Aviation Plug-In scheme for SMEs

<table>
<tr><th>7</th><th>Synergy G</th><th>Harmonisation of processes</th><th colspan="2">Clean Aviation Plug-In scheme for SMEs</th></tr>
<tr><td colspan="5">Description:
This synergy proposes the implementation of a Plug-In scheme for Small and Medium-sized Enterprises (SME) within Clean Aviation projects. It draws inspiration from the successful approach adopted by the European Innovation Council (EIC) under Horizon Europe: The Plug-In scheme allows funding bodies managing other parts of the Horizon Europe and funding bodies managing certified national/regional programmes to submit projects from their portfolio directly to the full application stage of the EIC Accelerator[24].

The Clean Aviation Plug-In scheme aims to accelerate SME integration into Clean Aviation projects and foster their involvement in the development and deployment of Clean Aviation technologies. SMEs funded under national or regional calls focusing on Clean Aviation key technologies can submit a streamlined proposal linked to CAJU calls. This approach allows them to potentially join larger, ongoing projects already running under CAJU. Additionally, this synergy aligns with Synergy F: Clean Aviation Seal of Excellence, which can validate SME proposals. Through Synergy G: Clean Aviation Plug-In Scheme for SMEs, entities previously funded by regional or national bodies can directly submit a full proposal to the Clean Aviation SME open call (Synergy R), further facilitating their participation and scaling of innovation.</td></tr>
<tr><td colspan="3">Strengths:
• Enhanced participation of SMEs in Clean Aviation projects
• SMEs gaining access to larger funding opportunities.
• Reduced administrative effort for SMEs
• Strengthened innovation ecosystem working on Clean Aviation key technologies</td><td colspan="2">Limits:
• Potential for increased workload and resource demands on CAJU for managing additional proposals
• Ensuring the quality and competitiveness of proposals submitted through the Plug-In scheme</td></tr>
<tr><td colspan="3">Policy considerations:
• Development of harmonized guidelines and procedures for SMEs participation in Clean Aviation projects
• Potential adjustments to existing Clean Aviation funding regulations to accommodate with the Plug-In schemes</td><td colspan="2">Necessary actors to be involved:
• Clean Aviation Joint Undertaking
• National and regional funding bodies supporting Clean Aviation technologies with specific regards to MoC-signed regions</td></tr>
</table>

[24] https://eic.ec.europa.eu/eic-funding-opportunities/eic-accelerator/fast-track-and-plug-schemes-eic-accelerator_en, last accessed 29th of October 2024

Main steps in the process:



Develop detailed guidelines and procedures: Define clear eligibility criteria, application processes, and selection methodologies for the Plug-In scheme.

Establish communication channels: Implement effective communication strategies to reach relevant stakeholders and raise awareness about the new schemes.

Train and support national/regional funding bodies: Provide training and support to national and regional funding bodies regarding procedures for identifying and guiding potential SME applicants.

Integrate schemes into existing projects: Establish a seamless integration process of the Plug-In scheme within the existing Clean Aviation projects, involving the consortia of ongoing projects.

Implement SME into CAJU projects: After a successful validation, the SME can be integrated into the ongoing CAJU project and receive funding for its involvement.

ECARE recommendations:

It is beneficial to engage clusters and large industrial companies to maximize the impact of the Plug-In scheme for SMEs in Clean Aviation projects. Clusters should play a proactive role in promoting the program within their local SMEs communities, organizing workshops to explain the scheme and guide SMEs through the application process. Additionally, large industrial companies are encouraged to publish their specific needs for support in Clean Aviation projects, using the ECARE platform as a central hub for these calls. This approach allows SMEs to identify relevant opportunities and align their capabilities with industry demands.

CAJU is advised to take the lead for implementing this synergy, as it cannot be launched without the need for formal pre-engagement from national or regional funding bodies. It is recommended that CAJU offers additional resources to support the participation of SMEs in the program via this scheme.

It is recommended to link this synergy mechanism to synergy F, the Seal of Excellence mechanism, which allows an additional validation of the SMEs which are applying for the Plug-In scheme. Also, this synergy would permit to SMEs to directly submit full proposal in the Synergy R: Clean Aviation open call for SMEs.

4.8 Synergy H - Regular meetings and communication between regional, national and European funding bodies

8	Synergy H	Harmonisation of processes	Regular meetings and communication between regional, national and European funding bodies

Description:
This synergy aims to foster continuous dialogue and collaboration between regional, national, and European public funding bodies involved in aeronautics. It proposes the establishment of regular meetings as a platform for the exchange between funding bodies. Each country would appoint a representative from their respective funding authority, with the frequency of meetings tailored to each nation's needs. Additionally, all regions with a relevant aeronautics industry are appointing a representative. The primary objectives of these gatherings include presenting current and future calls & R&D funded projects, identifying opportunities for collaborative and joint funding initiatives, and sharing best practices and knowledge to enhance the overall effectiveness of aeronautics funding across Europe.

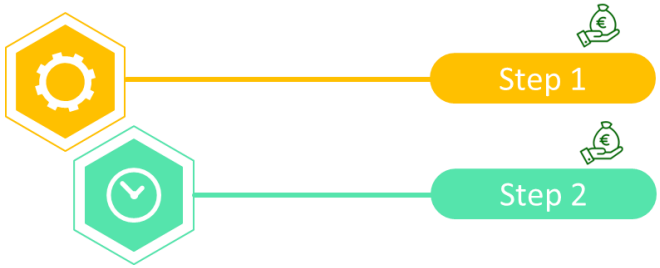
Strengths:
- Enhanced communication and collaboration among funding bodies by strengthening the network
- Identification of potential opportunities for joint funding
- Improved knowledge sharing on funded projects and dissemination of best practices

Limits:
- Time and commitment required for effective regular meetings
- Potential challenges in consensus, coordinating diverse technical priorities and joint funding initiatives.
- Willingness to share (confidential) information

Policy considerations:
- Confidentiality policies of the different funding bodies

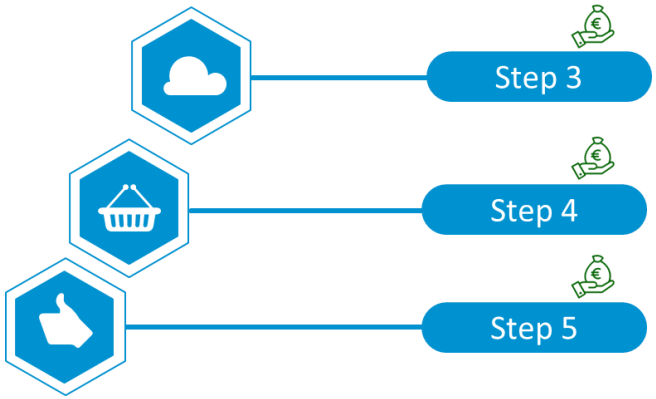
Necessary actors to be involved:
- One representative from each region with aeronautics as a priority
- One representative from each national funding body
- One representative from CAJU

Main steps in the process:



Identify the leader of this action: Form a committee with the designated representatives from each funding body which is interested in participating. Then, the responsibilities for organizing and leading the meetings can be decided.

Develop a meeting agenda and structure: Define the objectives, format, and frequency of the meetings.



Establish a communication platform: The ECARE Digital platform can be utilized to facilitate information exchange and collaboration between meetings.

Organize and facilitate meetings: Conduct regular meetings according to the agreed-upon schedule and agenda.

Monitor and evaluate: Regularly assess the effectiveness of the meetings and make adjustments as needed.

ECARE recommendations:

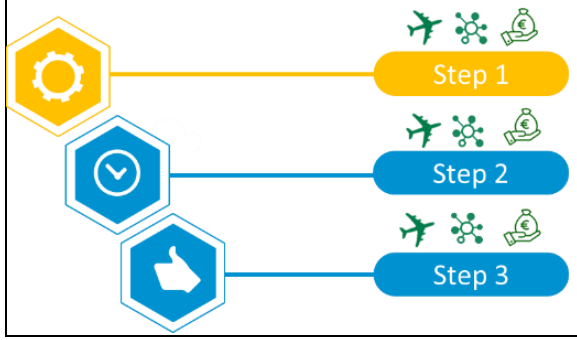
Each EU country should establish a national committee comprising representatives from the main national funding bodies and at least one representative from each region which has a relevant aeronautics industry. The structure of these committees may vary depending on the specificities of each country, with some opting for regional-level committees only. These committees should meet regularly, ideally on a monthly basis, with the frequency and agenda determined by the participants.

The goal of these meetings is to enhance coordination and collaboration between national and regional funding bodies and the Clean Aviation Joint Undertaking (CAJU). CAJU representatives would be invited to participate in these meetings at key points to share updates on new calls, results from regional and national calls, and other relevant data. Each meeting could focus on a specific topic, such as the presentation of regional funding projects to identify potential joint funding opportunities or the harmonization of proposal requirements. The regional and national funding bodies could receive more detailed data from CAJU than what is publicly available, including information on funded projects, selected companies, budgets, funding percentages, and the distribution across countries and regions. This data can be shared by CAJU in the meetings.

The success of these meetings depends on several key factors, including active participation and commitment from all involved funding bodies, the establishment of a clear agenda and structure for the meetings, and the use of a shared platform (ECARE Digital Platform) for information exchange and collaboration. There must also be agreement on the type and extend of information to be shared.

The ECARE recommends that SRG members initiate these meetings in their respective countries. To formalize this process, the specificities of these meetings should be defined during the alignment of the technical roadmap, as outlined in Synergy A. If a joint roadmap has not been established, these meetings could serve as a forum for defining other collaboration topics.

4.9 Synergy I - Communication between consortia of projects in different funding programs

<table>
<tr><th>9</th><th>Synergy I</th><th>Communication and transparency</th><th>Communication between consortia of projects in different funding programs</th></tr>
<tr><td colspan="4">Description:
Promoting communication between consortia of projects in different funding programs within aeronautics is crucial for fostering collaboration and efficiency. This can be achieved through various means such as organizing networking events, establishing a consortium mentorship program, and facilitating discussion forums on ECARE Digital Platform. These initiatives aim to provide platforms for consortia to share knowledge, explore collaboration opportunities, and support each other's projects. One example could be the exchange between consortia of CAJU projects and consortia of projects in MoC regions with regional funding.</td></tr>
<tr><td colspan="2">Strengths:
• Facilitates knowledge sharing and collaboration opportunities
• Enhances efficiency and effectiveness in development of new projects
• Fosters a supportive and interconnected community</td><td colspan="2">Limits:
• Limited resources/time for supporting communication initiatives to other consortia
• Resistance to collaboration from some consortia members due to confidentiality</td></tr>
<tr><td colspan="2">Policy considerations:
• Alignment of funding body guidelines and regulations
• Consideration of intellectual property rights and confidentiality agreements</td><td colspan="2">Necessary actors to be involved:
• Representatives of funding bodies, e.g. project officers
• Consortium members of funded projects</td></tr>
<tr><td colspan="4"><u>Main steps in the process:</u>
 

Prepare: Identify key stakeholders and establish communication channels

Organise: Plan and organize networking events, mentorship programs, and discussion forums

Implement: Facilitate interaction and knowledge sharing among consortia members by providing public funding to support these initiatives</td></tr>
</table>

ECARE recommendations:

Existing networks such as European Enterprise Network Aerospace and Defence sector group and Greenet project, or newly established project, could facilitate ongoing communication and exchange of ideas between consortia members throughout the duration of their projects via online forums. The use of the ECARE Digital Platform for the integration of funded projects and create a workspace for them to discuss and exchange best practice could be a first step. The existing networks could also organize networking events to support the communication between consortia.

The success of this synergy depends on active participation from all consortia members, clear communication channels, and commitment from funding bodies of the involved projects, to support, integrate and promote these initiatives.

4.10 Synergy J - Joint information days with different funding bodies

10	Synergy J	Communication and transparency	Joint information days with different funding bodies

Description:

This synergy proposes joint information days organized by regional, national, and European funding bodies within a region/country having an aeronautic supply chain. These events aim to:

- Jointly promote the existing calls to all interested stakeholders to lower the entry barrier for local stakeholders by clarifying the research topics, requirements for application and proposal
- Facilitate consortia building with matchmaking by bringing together potential project partners and fostering collaboration from the region/country and beyond.

The joint information days could be organised on a regular basis, to become the one-stop meeting to know about the current funding opportunities and create potential future collaborative projects. The regularity would be adapted depending on the different time frames of funding programs.

Strengths:

- Increased awareness and accessibility of funding opportunities
- Streamlined consortia building and project development
- Strengthened partnerships between funding bodies and regional/national communities and beyond

Limits:

- Resource requirements for organizing and facilitating joint information days
- Potential challenges in coordinating the participation of diverse funding bodies and the networking
- Lack of news and funding opportunities needed to maintain regular joint information days

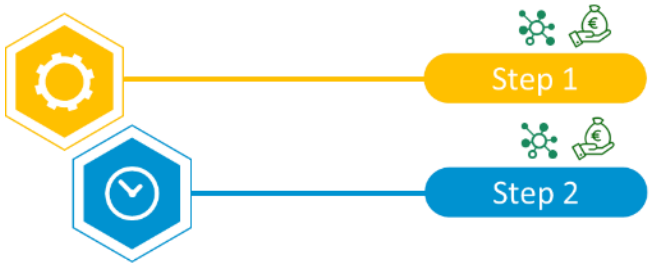
Policy considerations:

- Existence or creation of supportive policies that encourage collaboration among funding bodies

Necessary actors to be involved:

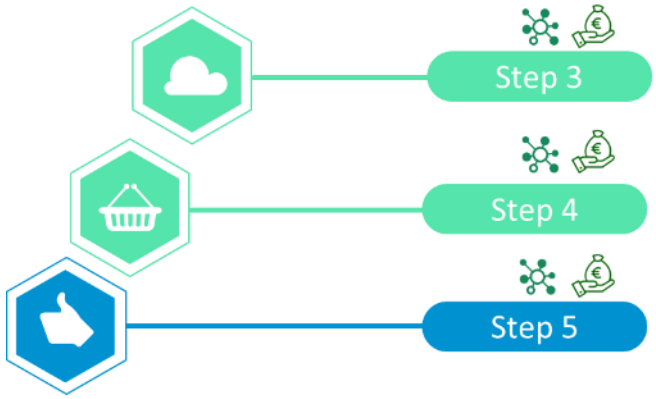
- Regional, national and European funding bodies
- Clusters

Main steps in the process:



Planning and coordination: Establish a planning with representatives from all involved funding bodies to define the objectives, format, and logistics of the information days.

Stakeholder outreach: Develop and implement a targeted communication strategy to reach relevant stakeholders with clusters, business networks and other development agencies.



Organizing the event: Secure a suitable venue, finalize program details, and arrange logistics (e.g., registration, catering).

Conducting the information day: Deliver informative presentations on funding opportunities and consortia building, facilitate networking activities, and address participant inquiries.

Follow-up and evaluation: Assess the effectiveness of the information day, gather feedback from participants, and identify areas for improvement for future events.

ECARE recommendations:

It is recommended to transition from hosting separate events of individual funding bodies to organizing consolidated information days that bring multiple funding bodies together. This approach will offer participants a more comprehensive understanding of available opportunities and encourage cross-collaboration.

National Contact Points (NCPs) and the Enterprise Europe Network (EEN) should be engaged to co-organize these events, ensuring broader outreach and participation. **Clusters can play a pivotal role by leading networking and matchmaking sessions**, creating a structured environment for pitching project ideas and forming consortia. A cohesive communication strategy involving all relevant entities—funding bodies, clusters, NCPs, EEN, and regional innovation agencies should be developed to effectively target the right participants.

National and regional funding bodies should reach out to CAJU once the need for an information day arises, considering the possibility to jointly organize the event. It can also be incorporated in future Memoranda of Cooperation (MoC) as a joint action of the MoC region together with CAJU.

4.11 Synergy K - Specific calls at regional and/or national level coherent with Clean Aviation key technologies

11	Synergy K	Emerging funding opportunities	Specific calls at regional and/or national level coherent with Clean Aviation key technologies

Description:
This synergy aims to align regional and/or national funding calls with Clean Aviation key technologies. The goal is to propose new calls to stakeholders that either build on ongoing CAJU Phase 1 projects, prepare for future initiatives in Phase 2, address technical areas not covered by Clean Aviation, or support projects with lower or higher TRL than the projects in Clean Aviation. This coordinated approach, linked to Synergy 1 and 2, seeks to create a cohesive funding strategy, with specific details like funding percentages, budgets, and eligible beneficiaries to be determined by the relevant regional and national funding bodies. The focus of the calls could be SMEs to prepare them for future participation in the CAJU program.

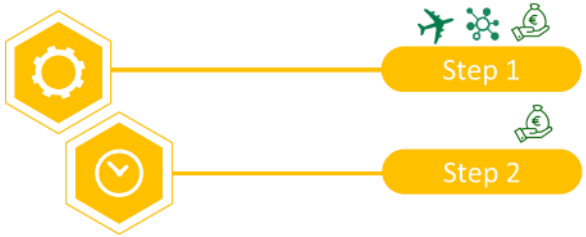
Strengths:
- Reduction of duplication of efforts and resources
- Enhanced coordination and alignment of funding efforts
- Promotion of collaboration between regional, national, and Clean Aviation

Limits:
- Potential resistance to change from established funding practices
- Challenges in harmonizing funding priorities and criteria across different levels
- Limited resources for supporting aligned funding initiatives

Policy considerations:
- Alignment of funding calls with Clean Aviation goals and objectives
- Consideration of regional and national priorities
- Ensuring inclusivity and accessibility of funding opportunities
- Compliance with international regulations and agreements governing research and innovation collaboration

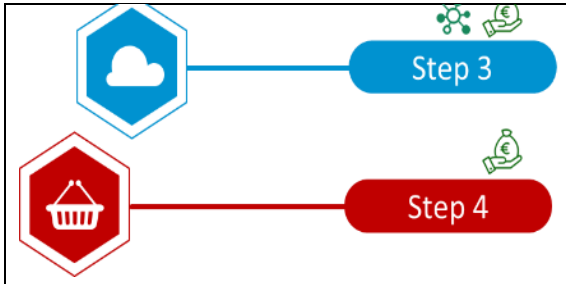
Necessary actors to be involved:
- Regional and national funding bodies
- Clusters
- Clean Aviation & industrials for consultation

Main steps in the process:



Engage stakeholders and identify technical needs: The regional or national funding body setting up the new call consults CAJU, large industrial and clusters to identify technical areas relevant for the call.

Determine the objectives and framework of the call: According to the gaps and needs, the topics for the new call are determined. The funding body determines available budget, time frame and the requirements for application, the eligible entities, etc…



Launch and promote the call for proposals: The call is launched by the funding body and promoted together with the cluster.

Select projects for funding: After receiving the proposals, the funding body decides which projects will be funded under the call.

ECARE recommendations:

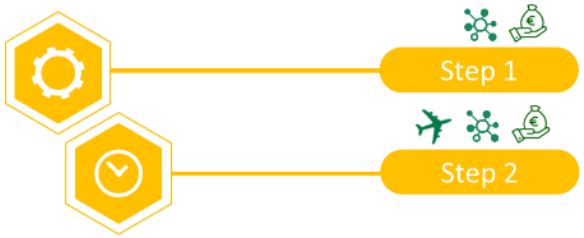
Regional and national calls could prioritize the participation of SMEs to prepare them for the development of new CAJU technologies. To facilitate the involvement of local stakeholders in future CAJU calls, project durations should be set between 12 and 24 months, providing a manageable timeframe for smaller entities. It's essential to involve industrial partners in the preparation of these calls to ensure that the key technological challenges are accurately identified and addressed.

To enable regional and national funding bodies to fund additional projects on CA technologies, CAJU should share information about proposals which they have rejected due to budget constraints. It is recommended, as in Synergy F: Clean Aviation Seal of Excellence, to transfer the full proposal and evaluation summary report to the regions and countries of the participating proposal-partners. Regional and national funding bodies should than consider to fund these projects. Entities wishing to benefit from the Seal of Excellence mechanism must, with the approval of their consortium, ensure the transfer of their proposal and evaluation report to the appropriate regional and/or national funding bodies. Another option is to transfer a CAJU call to regional or national level, if it did not receive enough applications at the European level.

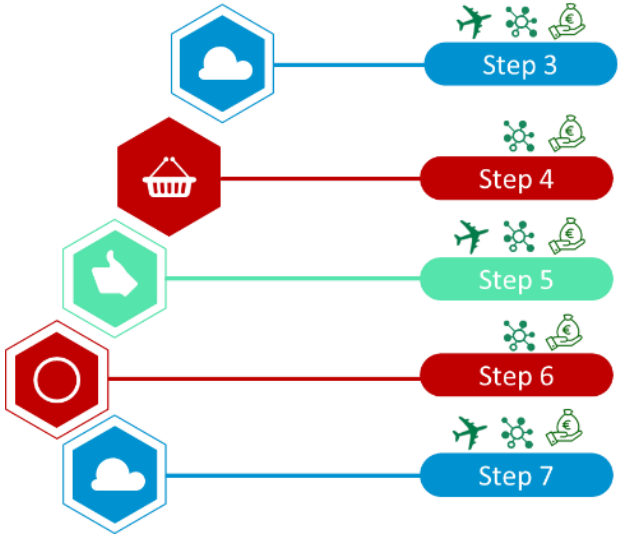
Considering the complexities of implementing a joint call, the most efficient approach would be that each consortium submits a global project with each funding body financing its own regional/national entities. In this scenario, the budget should be distributed by work packages and by regions/countries, with an adequate project reporting: Bi-lateral reporting between proposers and relevant funding body and multilateral reporting with all involved entities to ensure project coherent consistency.Additionally, the level of risk and control imposed by funding bodies and industrials must be carefully considered, as projects may involve new technologies that might not be integrated into future aircraft. To mitigate these risks, incorporating a research institution in a technological "de-risking" phase could be beneficial.

4.12 Synergy L - Cluster issuing a call of interest to initiate projects linked to Clean Aviation key technologies

<table>
<tr><th>12</th><th>Synergy L</th><th>Emerging funding opportunities</th><th>Cluster issuing a call of interest to initiate projects linked to Clean Aviation key technologies</th></tr>
<tr><td colspan="4">Description:
This synergy proposes a cluster-driven approach to promote and facilitate funding for projects working on Clean Aviation (CA) key technologies. The cluster, leveraging its technical expertise and network, organises a call of interest. The call is related to the technology needs issued by local industrial stakeholders involved in the Clean Aviation program, to address the aeronautics supply chain. A jury composed of cluster experts, funding bodies and industrial stakeholders would be created to select the projects to receive funding. Once selected, the selected projects of the call of interest will be proposed for funding to the regional and/or national funding bodies.

Such a call could be a win-win solution for industrial stakeholders and funding bodies, which could have the positive effect to stimulate the involvement of SMEs in future aircraft programs. The final objective is to prepare the aeronautics supply chain for the future CA technologies in development and to anticipate ramp up manufacturing of these technologies starting from 2035.</td></tr>
<tr><td colspan="2">Strengths:
• Streamlining the process for SMEs to access new funding opportunities on CA key technologies
• Increasing visibility for SMEs working on CA technology
• Leveraging cluster expertise for project selection and guidance</td><td colspan="2">Limits:
• Limited funding available by regional and national funding bodies
• Lack of technical expertise and capabilities in cluster</td></tr>
<tr><td colspan="2">Policy considerations:
• To streamline procedures for co-funding initiatives between funding bodies</td><td colspan="2">Necessary actors to be involved:
• Regional and national funding bodies supporting CA key technologies
• Cluster with expertise in CA technologies
• Clean Aviation for consultation and project presentation</td></tr>
<tr><td colspan="4"><u>Main steps in the process:</u>
 

Align of roadmap (MoC, preparatory meeting) and development of the call for interest, the cluster sets up the call (eligibility criteria and application process), defines the evaluation process (criteria, schedule, etc) and create the jury composed of regional and national funding bodies, cluster expert and industrials.
Collection of technical needs from industrial: The cluster collects the technological needs of its local industrials working on CA key technologies. These needs are proposed as main topics of the call for interest, to be answered by SMEs or ISE.</td></tr>
</table>



Presentation of the roadmaps and launching of the call for interest to the targeted audience during a "joint information day" bringing together different funders, industrials, SMEs and ISE. The cluster, funding bodies and EEN use their networks and communication channels to reach relevant entities.

Emergence of projects answering calls for expression of interest based on the needs of industrials and funding opportunities

Evaluation and selection of proposals: The experts committee evaluates the applications based on pre-defined criteria (e.g., technical topics, alignment with CA goals, potential impact, etc…), and selects the laureate proposals to be retained for potential funding.

Matching projects with funding: selected projects are directed to the most suitable funding bodies (regional and/or national) with a possibility to have co-funding for some projects.

Presentation of the selected projects to CAJU and industrials to present the SMEs working on CAJU technologies

ECARE recommendations:

The process to launch this synergy can be initiated either by a funding body aiming to foster the emergence of new projects pre-selected by a cluster, **or by a cluster** seeking to stimulate the creation of projects within its area, which can then be submitted to the relevant regional or national funding body.

Collaboration between the regional and national funding bodies during the proposal selection process should encourage the creation of co-funding opportunities for selected projects, ensuring broader financial support and shared responsibility. Once projects are funded, it is essential for the funding bodies to present their outcomes to CAJU, demonstrating tangible progress and alignment with the CA key technologies.

Additionally, industrial stakeholders should hold annual meetings with regional funding bodies and clusters to present their technical needs, ensuring that local challenges are addressed effectively.

4.13 Synergy M - Simultaneous calls for interest in different countries for Eureka-Eurostars projects linked to Clean Aviation key technologies

13	Synergy M	Emerging funding opportunities	Simultaneous calls for interest in different countries for Eureka-Eurostars projects linked to Clean Aviation key technologies

Description:
This synergy proposes the launch of simultaneous calls for interest aimed at stimulating the development of projects focused on Clean Aviation key technologies, with the intention of submitting these projects to the Eureka-Eurostars. The initiative would require collaboration between at least two clusters from different countries, fostering the creation of new consortia. Each participating cluster would be responsible for analysing the technical priorities of their region in relation to Clean Aviation objectives, with industrial stakeholders playing a crucial role in identifying these priorities and participating in the proposal selection process. To ensure alignment and dedicated funding for this synergy, it is essential that clusters coordinate with the funding bodies responsible for the Eureka-Eurostars call in their respective countries.

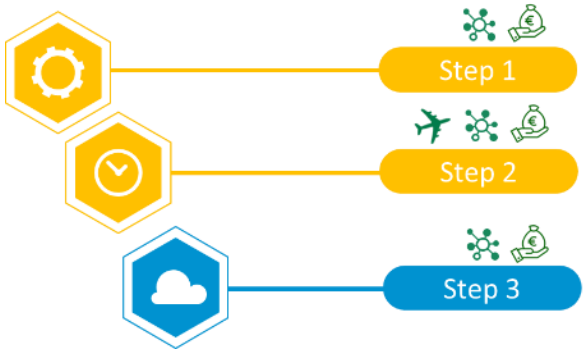
Strengths:
- Making use of already existing Eureka-Eurostars funding mechanisms
- Stimulating cross-border collaboration between SMEs
- Aligning projects with Clean Aviation priorities ensures an impact for both the aeronautics sector and the involved SMEs

Limits:
- Potential resistance of Eureka-Eurostars program to divert funds to aeronautics
- Complexity of coordination with multiple stakeholders

Policy considerations:
- Agreement between CAJU and the Eureka program to provide funding for aeronautics projects

Necessary actors to be involved:
- European funding bodies
- Eureka-Eurostars funding body
- Clusters from different countries
- Industrial stakeholders

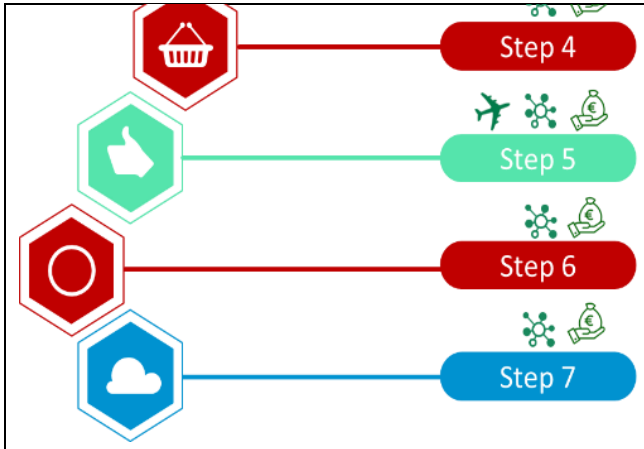
Main steps in the process:



Official agreement from the Eureka program to launch such a call for interest

Develop a call for interest: Identification of CA key technologies to be targeted, eligibility criteria definition, application process and selection methodology.

Disseminate the call for interest during a webinar coorganised with Eurostar and use cluster networks and communication channels to reach relevant SMEs.



Launch a call for interest: SMEs with expertise in developing sustainable aviation technologies are invited to answer.

Evaluate proposals and select promising projects: The clusters would evaluate the applications based on pre-defined criteria (e.g., technical topics, alignment with CA goals, potential impact, etc…) to identify consortium with high potential.

Invitation of the consortiums to prepare a Eurostars proposal with clusters helping in the preparation

Presentation of the selected projects to CAJU and industrials to present the SMEs working on CAJU technologies

ECARE recommendations:

All countries and regions wishing to advance the development of their aviation sector should encourage their clusters to iterate such a call for interest, enabling the identification of strategic transnational projects, fostering collaboration among stakeholders, and aligning regional efforts with broader national and European priorities.

Linked to this call for interest, ECARE recommend to organise a joint online event between two or more clusters from different countries. This event would be an informative webinar on all the funding opportunities that exist in each country presented by the participating clusters and specific time would be allocated to the clusters to present their opportunities such as this call for interest and the technical priorities of their ecosystem. By the end of the webinar, a matchmaking event would be organised to create links between the interested stakeholders of different countries.

Considering that the Eureka-Eurostars call is open for submissions twice a year (March and September generally), ECARE suggests the following timeline, based on discussions with a funding body involved in the Eureka-Eurostars call management: clusters would lead the call for interest in September, followed by a webinar between funding bodies and clusters in November. The selection of companies from the call would take place in December, with consortium creation and proposal preparation occurring from January to March of the following year, culminating in the submission of proposals in March.

ECARE also proposes that all funded projects be integrated into the ECARE Digital Platform, ensuring that all funding bodies have access to detailed information about these projects. Additionally, ECARE suggests utilizing its taxonomy tool to identify key technical areas across countries, allowing for an assessment of the technological capabilities of clusters in participating regions.

4.14 Synergy N - Unified collaborative aeronautics funding

14	Synergy N	Emerging funding opportunities	Unified collaborative aeronautics funding

Description:

This synergy aims to ensure continuous funding for global aeronautic projects. The idea would be to launch a call with one single technical topic, addressing several technology blocks of different maturity levels, going from basic research to industrialisation. This call would involve different funding bodies. To achieve this synergy, funding bodies must agree on the topic of the call and determine which funding body will fund which TRL level and/or technology block. Each project should be divided into distinct phases to enable funding bodies to effectively monitor progress. This phased approach allows for regular evaluation of project advancement, facilitating decisions to continue or terminate funding based on performance metrics. Subsequently, clusters can contribute to organizing a joint information day to disseminate the call to the supply chain.

This approach is particularly advantageous when substantial investments are required for a specific technological advancement.

Strengths:

- Ensures continuous funding support throughout the global project
- Facilitates seamless progression of projects from basic research to commercialization
- Maximizes efficiency by leveraging the expertise and resources of multiple funding bodies

Limits:

- Potential challenges in coordinating funding priorities and allocations across different funding bodies (administrative efforts)
- Difficulties to fund TRL higher than 6 dues to state aid rules

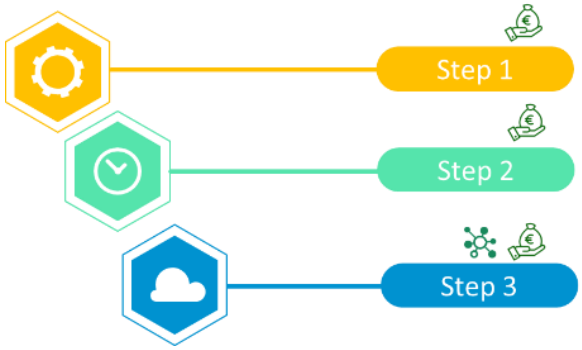
Policy considerations:

- Consideration of regional and national priorities and strategies.
- State Aid Rules to fund TRL higher than 6
- Compliance with international regulations and agreements governing research and innovation collaboration

Necessary actors to be involved:

- Regional, national, and European funding bodies

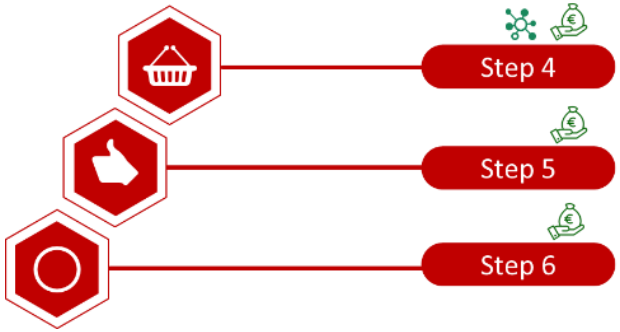
Main steps in the process:



Identification of common transition topics suitable for multi-TRL funding, to identify the topics to prioritise based on environmental impact, market potential, societal impact, and alignment with funding agencies' strategic goals.

Agreement among funding bodies on the scope of the call and the allocation of TRLs: Establish a shared vision for the call's objectives and outcomes, allocate TRLs to different funding bodies based on their expertise, available resources, and funding instruments.

Presentation of the call and particular rules of the call during a joint info day regrouping all the funding bodies, disseminate information about the call's goals, scope, eligibility criteria and clarify the application process, evaluation criteria, and funding conditions.



Launching the call and soliciting proposals from eligible applicants: Entities with expertise in developing sustainable aviation technologies are invited to answer.

Evaluation and selection of proposals based on predefined criteria and TRL requirements: Evaluation of the applications based on pre-defined criteria (e.g., technical topics, alignment with CA goals, etc…) and prioritize projects that demonstrate a clear path to commercialization and create high-impact outcomes.

Follow-up and evaluation: Assess regularly the effectiveness of the project to facilitate decisions to continue or terminate funding based on performance metrics.

ECARE recommendations:

ECARE recommends involving all funding bodies in Step 1 to collaboratively identify one or more specific topics suitable for continuous funding of aeronautical projects, spanning from basic research to commercialization. Additionally, ECARE suggests engaging industry and cluster representatives to pinpoint priority technical areas within the aeronautics sector.

Given the complexities of implementing a unified funding program, a more pragmatic approach involves each funding body focusing on the decided specific topic and issuing its own call. While companies would apply separately to each funding body, regular progress reports and evaluation mechanisms would be established to monitor project advancement and inform funding decisions.

At least two funding bodies should agree to fund different TRL for a specific technical domain identified as important, for example: A national funding body might support basic research activities (TRL 1-3), while a European funding program could provide funding for pilot-scale testing and demonstration activities (TRL 4-6). A regional funding program could support TRL 7-8 of the projects.

It has to be recognized that monitoring and evaluating the progress of multiple funded projects can be complex. Effective communication and transparency among funding bodies are essential for successful oversight. While regular exchange of project reports is crucial, it is imperative to avoid excessive administrative burdens. A streamlined reporting system that focuses on key performance indicators can optimize the process.

4.15 Synergy O - Clean Aviation cascade funding

15	Synergy O	Emerging funding opportunities	Clean Aviation cascade funding

Description:

This synergy proposes a cascade funding mechanism co-funded by the Clean Aviation Joint Undertaking and regional funding bodies[25]. The mechanism includes a territorial return guarantee, ensuring a portion of the funding benefits to SMEs within the regional authority's jurisdiction.

Cascade funding, also known as Financial Support for Third Parties (FSTP), is a Commission mechanism to distribute public funding in order to assist beneficiaries, such as start-ups, scale-ups, SMEs and/or mid-caps, in the uptake or development of innovation. One of the main objectives would be to identify key technical priorities and prepare the supply chain to new aviation technologies being developed.

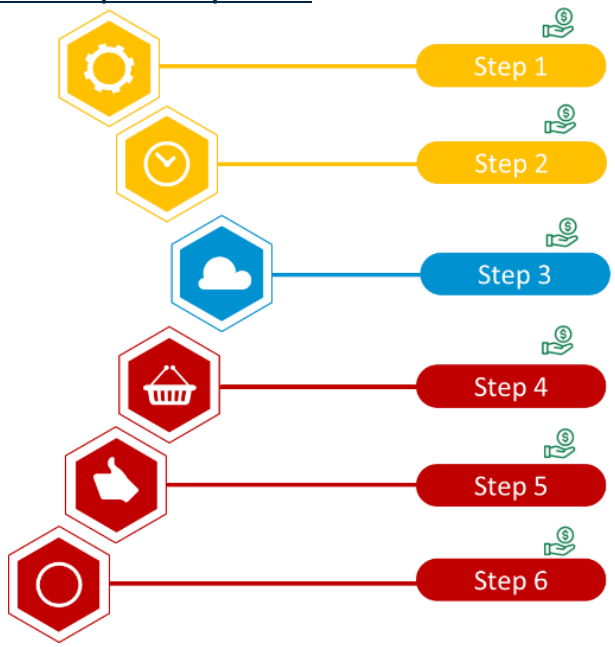
The cascade funding would be firstly proposed to the regions having signed an MoC. CAJU would submit a dedicated call for proposal to identify the most relevant projects for the cascade funding. Then, one or several consortia would lead and manage the cascade funding calls.

The Clean Aviation Cascade funding would be a mechanism that allows to distribute small amount of public funding in the regions participating and assist their beneficiaries, in the uptake or development of CA key technologies. Each cascade funding beneficiary would be offered complementary services such as support in developing a roadmap for transitioning to Clean Aviation technologies, mentorship services throughout the project duration, individualized matchmaking and more.

Strengths:	Limits:
• Beneficiaries developing knowledge in CA key technologies • Increased funding opportunities for smaller entities in CA key technologies • Targeted funding for specific technological needs of large industrial players • Faster project development	• Increased administrative burden for CAJU in managing consortia with cascade funding calls
Policy considerations: • Development of clear guidelines and frameworks for the implementation of Clean Aviation Cascade Funding • Compliance with international regulations and agreements governing research and innovation collaboration	**Necessary actors to be involved:** • Regional funding bodies & Clean Aviation Joint Undertaking

[25] "Under Article 26(1) CPR, Member States may request the transfer of up to 5 % of their resources under shared management to any other EU fund(s) or instrument(s) under direct or indirect management":https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022XC1104(02), last accessed 29th of October 2024

Main steps in the process:



Agreement between Clean Aviation and regional authorities accepting to provide 30% of their ERDF funds for each project funded in their region.

Develop cascade funding guidelines: Establish clear procedures and criteria for collaboration between CAJU, consortia, and future beneficiaries. And define specific technological challenges for cascade funding calls based on large industrial players identify R&D needs.

Launching of the CAJU cascade funding call and soliciting proposals from eligible applicants: Entities with expertise in managing cascade funding calls in aviation are invited to answer.

The selected projects launch calls: Disseminate information and manage the application process for their specific cascade call.

Evaluation and selection: Review proposals based on pre-defined criteria and select promising projects for funding.

Project execution and monitoring: Monitor project progress, ensure proper use of funds, and report outcomes to CAJU.

ECARE recommendations:

Regional funding bodies should cooperate with industrials to identify the key technical priorities relevant for aeronautics funding, either through direct consultation or by incorporating the identification of these priorities into the CAJU call for proposals. To address these priorities, regional funding bodies could utilize ERDF funds. Through establishing a synergy with CAJU, both the regional funding authority and CAJU could cover budget for the cascade funding. One example would be that CAJU covers 70 percent, while the remaining 30 percent is provided by the regional funding bodies through ERDF funds.

To ensure transparency and coordination, all projects and beneficiaries should be published by integrating their information into the ECARE Digital Platform. This would streamline access to data and enhance collaboration across different funding bodies.

Cluster are particularly suitable for managing cascade funding projects, as they can leverage of their community in the region, including their relationship with funding bodies, large industrial stakeholders and SME. Several European clusters which are members of the ECARE Stakeholder Group have already expressed their interest for managing such a project.

4.16 Synergy P - Aeronautical IPCEI

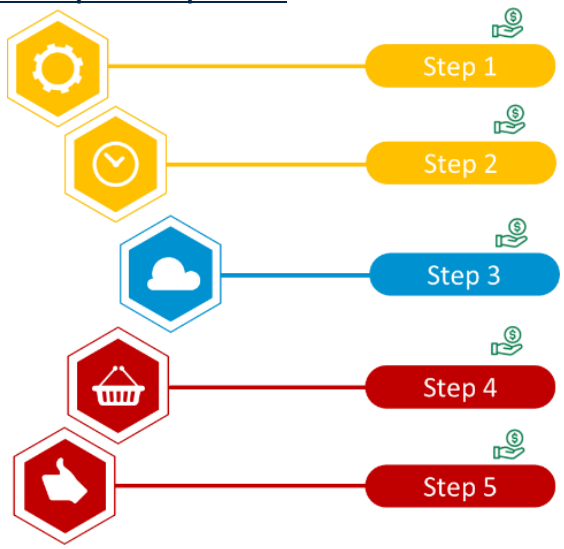
<table>
<tr><th>16</th><th>Synergy P</th><th>Emerging funding opportunities</th><th>Aeronautical IPCEI</th></tr>
<tr><td colspan="4">Description:
An aeronautical IPCEI (Important Project of Common European Interest) would be a large-scale European collaborative project to develop and deploy new aeronautical technologies. It would be funded by a consortium of public and private partners from across Europe. The goal of an aeronautical IPCEI would be to accelerate innovation, industrialise developing technologies, reduce costs, and increase the competitiveness of the European aeronautical sector.

An aeronautical IPCEI would be a major investment in the future of the European aeronautical sector. It would help to ensure that European aviation industry continues to thrive. At the moment, there is no IPCEI in the aeronautical sector.

As an example, different IPCEI remains, such as the IPCEI for Hydrogen[26] is a program launched by the European Commission to foster the development of hydrogen technologies and infrastructure within the European Union. This initiative aims to accelerate the deployment of hydrogen across various sectors by supporting collaborative projects among EU member states and industry partners. In two rounds, a total of 76 projects in various EU countries have received public funding through this program. It is expected that the projects attract a significant additional amount of private funding.</td></tr>
<tr><td colspan="3">Strengths:
• Using already existing mechanisms that are recognized and implemented by EC and Member States
• Accelerated innovation: An IPCEI would work on the most challenging aeronautical challenges and accelerate the development of new technologies and capabilities.
• Fast-tracked Industrialization: The program would facilitate the swift transition of developed technologies from the research phase to real-world industrial applications.
• Shared costs: An IPCEI would allow the costs to be shared across a number of European partners and member states.</td><td>Limits:
• Potential resistance of Member States to divert IPCEI funds to aeronautics since a specific program already covers this sector.
• Difficulties to agree on a selection of technologies for sustainable aviation to be funded</td></tr>
<tr><td colspan="3">Policy considerations:
• Alignment with existing IPCEI-related policies
• Compliance with international regulations and agreements governing research and innovation collaboration</td><td>Necessary actors to be involved:
• European Commission
• Member States
• Clean Aviation Joint Undertaking</td></tr>
</table>

[26] https://single-market-economy.ec.europa.eu/industry/strategy/hydrogen/ipceis-hydrogen_en, last accessed 29th of October 2024

Main steps in the process:



Feasibility Study: CAJU assesses feasibility, by consulting the member states, the governing board, other key stakeholders and conducts a thorough analysis of opportunities and challenges.

Defining the IPCEI Framework: Negotiates an interinstitutional agreement between the EC and member states, identifying the program framework, key technical topics, funding details and future pilot projects.

Launch of the Call for Proposals: Publication and communication of the detailed call for proposals. Proposals would be submitted and evaluated by the main funding body of each member state.

Project selection and funding: Winning projects are selected and funding agreements are negotiated and signed.

Monitoring and Evaluation: Implements a monitoring system, by conducting a periodic evaluations and disseminates results.

ECARE recommendations:

It is recommended to align the aeronautical IPCEI with existing EU initiatives, such as Clean Aviation and the European Green Deal, to create synergies and ensure coherence in advancing environmental sustainability and technological innovation in aviation.

The Draghi report on the future of European competitiveness, published in September 2024, highlights the critical importance of investment and innovation in driving Europe's leadership in clean energy and sustainable transport—both essential for the EU's strategic autonomy and industrial competitiveness. Additionally, investments in research, innovation and development are required to support Europe's position as a "first-mover" in sustainable transport, which is pivotal for the development of low-carbon fuels crucial for decarbonizing aviation and other sectors[27].

An IPCEI in aeronautics would not only accelerate the research and development of these transformative technologies but also actively support their industrial deployment and market entry. This includes financing the certification of new technologies—a critical and often costly phase in the aviation industry—and providing resources for building the necessary infrastructure, such as hydrogen refuelling stations, sustainable fuel production facilities, and electrified ground systems. Furthermore, an aeronautical IPCEI would facilitate the establishment of cross-border industrial value chains, ensuring that Europe remains competitive and united in developing and commercializing next-generation aviation solutions.

[27] https://commission.europa.eu/document/download/97e481fd-2dc3-412d-be4cf152a8232961_en?filename=The%20future%20of%20European%20competitiveness%20_%20A%20competitiveness%20strategy%20for%20Europe.pdf,

4.17 Synergy Q – Joint call on Clean Aviation key technologies

17	Synergy Q	Emerging funding opportunities	Joint call on Clean Aviation key technologies

Description:

This synergy introduces a joint call funding mechanism where two or three funding bodies collaborate to support projects focused on Clean Aviation key technologies. This mechanism can operate on a transregional and/or transnational basis. The participating funding bodies will agree on the specificities of the call, including the criteria for project selection. They will then jointly evaluate proposals and choose the projects to be funded. This approach enables support for a diverse range of projects, from basic and applied research to demonstration and industrialization efforts.

Unlike Synergy N, in which the funding bodies fund different TRL or technological bricks, this joint call acts as one funding initiative with its own unified regulations. Consequently, the beneficiaries will only receive funding from this initiative rather than from different funding bodies.

Strengths:

- Maximizes resources and expertise available from different regions or countries
- Possibility to provide a higher budget if necessary for complex research and/or specific technical topics

Limits:

- Potential administrative complexities associated with coordinating funding priorities and evaluation processes across different regions or countries
- Challenges in harmonizing criteria and expectations among funding bodies with different priorities and procedures
- Limited availability of resources and budgets

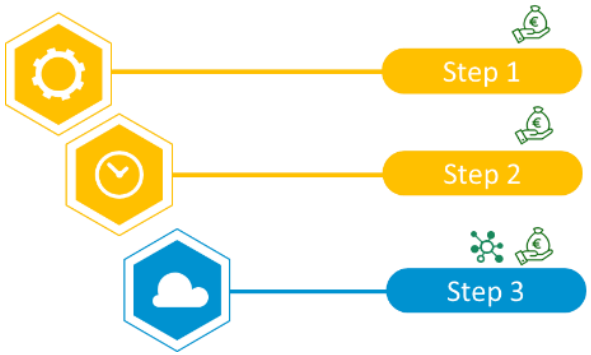
Policy considerations:

- Compliance with international regulations and agreements on governing research and innovation collaboration

Necessary actors to be involved:

- Regional, national, and European funding bodies

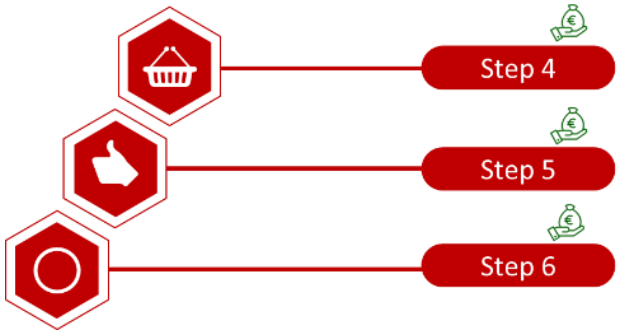
Main steps in the process:



Identification of common Clean Aviation key technologies suitable for co-funding through bilateral

Agreement among funding bodies on the scope and objectives of the joint call, as well as the criteria for project selection

Launching the joint call and soliciting proposals from eligible applicants with a joint info day



Joint evaluation and selection of proposals based on agreed-upon criteria and evaluation processes

Monitoring and Evaluation: Implements a monitoring system, by conducting a periodic evaluations and disseminates results.

Project execution and monitoring: Monitor project progress, ensure proper use of funds, and report outcomes to CAJU.

ECARE recommendations:

To enhance the effectiveness of the joint call funding mechanism, it is recommended to use the ECARE taxonomy tool to identify and prioritize the technical topics that will be addressed in the call.

Considering the complexities of implementing a joint call, two main approaches can be considered: The first approach involves each consortium submitting a global project where each funding body finances the entities in their respective countries. In this scenario, the budget should be organized by work packages and countries to facilitate project monitoring, with each project providing reports to the funding bodies managing its proposal. **Alternatively, a more streamlined approach** involves having a single funding body managing all projects, consolidating the entire budget under one funding body and requiring a pre-agreed common agreement among participating countries and regions.

It is advisable for countries aiming to develop their aviation industry to prioritize this synergy by establishing joint calls with neighbouring countries that already have existing aviation activities, thereby leveraging existing regional expertise and infrastructure.

4.18 Synergy R – Clean Aviation open call for SMEs

18	Synergy R	Emerging funding opportunities	Clean Aviation open call for SMEs

Description:

This synergy proposes a "CAJU open call for SME" aimed at inviting small and medium-sized enterprises to submit projects related to Clean Aviation's key technologies. Initially, this open call would target SMEs located in regions or countries that are signatories of the Clean Aviation Memorandum of Cooperation (MoC). The call would be structured in two phases.

In the first phase, SMEs would submit a project proposal in PowerPoint format, limited to 15 slides, to their main national funding body. The national funding body would then evaluate the proposal and decide whether to invite the SMEs to pitch their project in an oral presentation or not. Based on this evaluation and the oral, the SMEs would either be selected to proceed to the second phase or be declined.

For those advancing to phase two, the full project proposal would then be submitted to CAJU for final consideration. Instead of participating in phase 1, projects which have already received a Clean Aviation SoE (Synergy F) at national level can immediately be submitted to CAJU phase 2, thanks to the additional synergy G: Clean Aviation Plug-In scheme.

This synergy is inspired by a similar initiative under the European Defense Fund, which launched an open call for SMEs with necessary approvals from national authorities, as seen in the calls EDF-2024-LS-RA-SMERO[28] & EDF-2024-LS-DA-SME[29]

Strengths:

- Dedicated funding opportunity exclusively for SME
- Streamlined process through pre-validation by national funding bodies
- Increased efficiency and potentially higher success rate for SMEs applicants
- Encourages participation from a wider pool of SMEs across signatory regions

Limits:

- Limited funding available through CAJU compared to potential demand from SMEs
- Potential increased workload for national funding bodies due to pre-validation process

Policy considerations:

- Alignment of national pre-validation criteria with the strategic goals of Clean Aviation
- Streamlined procedures for data sharing and information exchange between national funding bodies and CAJU

Necessary actors to be involved:

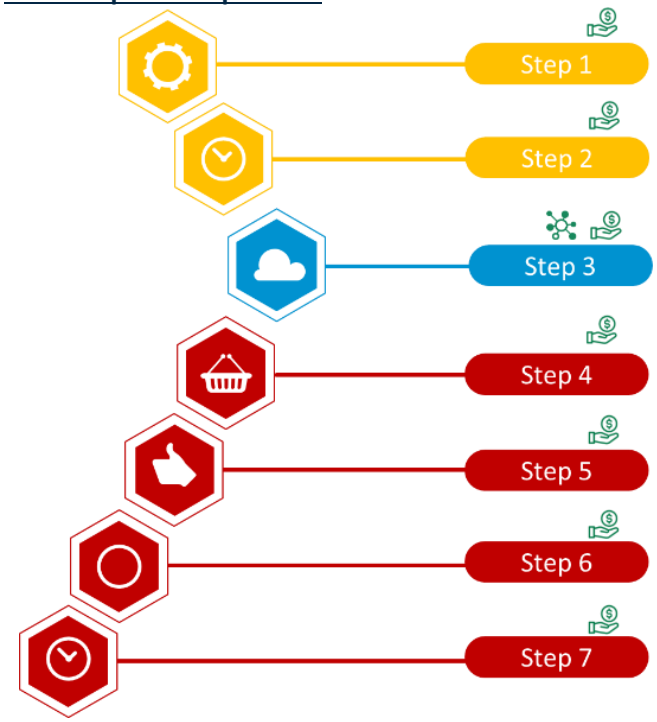
- Clean Aviation Joint Undertaking
- National or regional funding bodies with MoC

[28] https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/edf-2024-ls-ra-smero-nt?order=DESC&pageNumber=1&pageSize=50&sortBy=startDate&keywords=EDF-2024-LS-RA-SMERO&isExactMatch=true&status=31094501,31094502&frameworkProgramme=44181033, last accessed 29th of October 2024

[29] https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/edf-2024-ls-da-sme-nt?order=DESC&pageNumber=1&pageSize=50&sortBy=startDate&keywords=EDF-2024-LS-DA-SME-NT&isExactMatch=true&status=31094501,31094502&frameworkProgramme=44181033, last accessed 29th of October 2024

• Potential adjustments to CAJU funding regulations to accommodate pre-validated projects • Compliance with international regulations and agreements governing research and innovation collaboration	

Main steps in the process:



Develop joint guidelines: CAJU and national funding bodies establish clear guidelines for pre-validation and the CAJU open call, including eligibility criteria, application procedures, and evaluation processes.

CAJU Open Call: CAJU launches a dedicated open call for SME applications.

National pre-validation: SMEs enter in phase 1 by submitting their proposals to their respective national funding bodies for pre-validation based on national criteria and Clean Aviation strategic goals.

Pre-validated project list: National funding bodies submit a list of pre-validated projects to CAJU selected for Phase 2, along with relevant information and evaluations.

Proposal preparation: SMEs enter in Phase 2 by preparing their full proposal

Evaluation and selection: CAJU evaluate proposals based on pre-defined criteria and selects projects for funding.

Project execution and monitoring: Selected SMEs receive funding, execute their projects, and report progress to CAJU.

ECARE recommendations:

Clusters should be actively involved in Phase 1 by encouraging SMEs within their networks to submit project proposals to national funding bodies. To enhance the project selection process, **national funding bodies could establish an advisory committee** to participate in the jury for CAJU's Phase 1 Open Call. **This advisory committee should include several experts, such as funding bodies, integrators, OEMs, and other relevant fields**, to ensure a well-rounded evaluation of proposals. Regional and national funding bodies also emphasize the need for CAJU to provide robust post-project support to ensure the sustainability and impact of funded projects.

Initially, this synergy should target SMEs from countries or regions that already have Memoranda of Cooperation (MoCs) with CAJU. If successful, the mechanism could be expanded across the entire European Union, broadening its impact and reach.

5. ECARE toolbox

The ECARE Toolbox is a comprehensive suite of tools designed to support the implementation of synergies within the aeronautics sector presented in the section 3 & 4.This section provides an overview of the key components of the toolbox, including the ECARE Digital Platform, the ECARE Taxonomy and the ECARE Taxonomy Tool. These tools offer valuable resources for stakeholders to identify funding opportunities, funded projects, assess technical priorities, and facilitate collaboration. The diagram below illustrates the different phases of the ECARE pathway to synergies and highlights the corresponding tools within the ECARE Toolbox that support each phase.

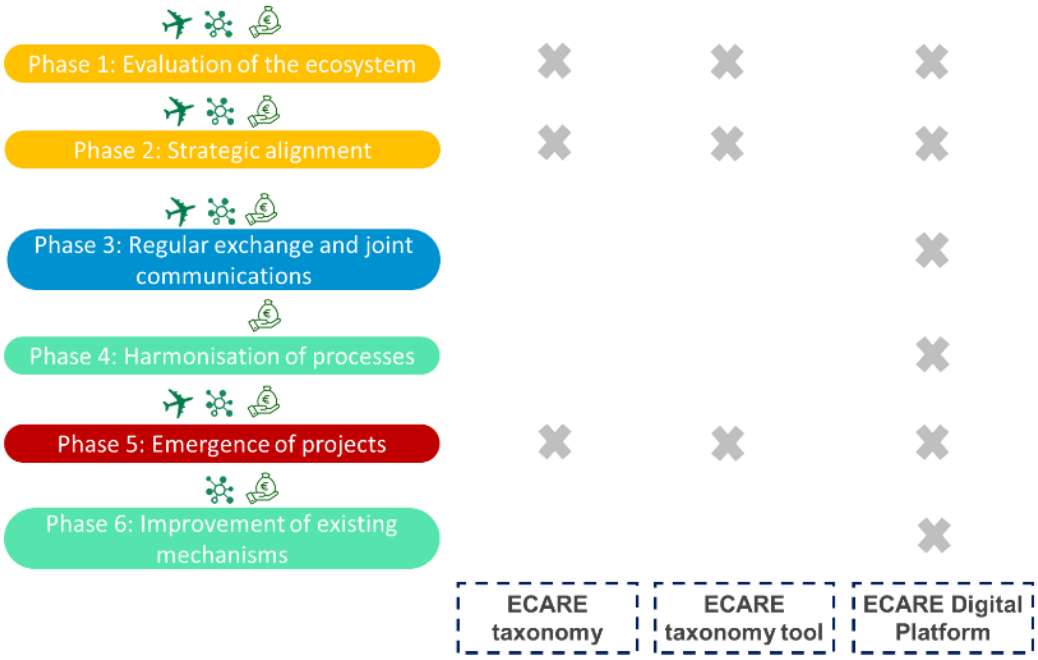


Figure 5: Phases of the ECARE Pathway to Synergies and Corresponding Toolbox Components

5.1 The ECARE taxonomy: a common language for the aviation sector

Origins and motivation. In the aeronautics sector many taxonomies have been adopted over the years trying to fix a commonly understood, shared and recognised nomenclature of structured technological topics. The adoption of a commonly recognised and shared taxonomy is an important element, as the taxonomy is used as a sort of reference measurement system.

Methodology. Following the study of old taxonomies, ACARE and EDA taxonomies were identified as the best starting points because they involve aeronautical technologies applicable to the Clean

Table 4: ECARE taxonomy topics

A. Flight physics - A1. Aerodynamics
A. Flight physics - A2. Thermal & Fluidynamics
A. Flight physics - A3. Structural Mechanics & Smart Materials
B. Manufacturing Processes/Design Tools/Techniques
C. Materials Technology - C1. Electronic
C. Materials Technology - C2. Photonic/Optical
D. Device Technology
E. Design Technologies for Platforms
F. Aerostructures
G. Propulsion - G1. Endothermic Systems
G. Propulsion - G2. Green Propellant & Combustion
G. Propulsion - G3. Electric Systems
H. Avionics & On-board Systems - H1. General
H. Avionics & On-board Systems - H2. Communications
H. Avionics & On-board Systems - H3. Sensor Systems
H. Avionics & On-board Systems - H4: Major s/s
I. Flight Mechanics
J. Information and Signal Processing Technology
K. Integrated Design & Validation
L. Integrated Systems Technology
M. Human Factors
N. Innovative concepts & scenarios
O. Operating Environment Technology
P. Simulators, Trainers and Synthetic Environments

Aviation. A first list of relevant topics[30] and subtopics[31] were identified from ACARE and EDA elements. The complex process followed to arrive at the final ECARE Taxonomy included the identification of obsolete topics and subtopics which were eliminated and of new topics/subtopics included to consider the latest developments, i.e. electric, hybrid and hydrogen propulsion system, clean propellants, and so forth.

Validation. To validate the obtained taxonomy, the consortium evaluated it on the basis of their own knowledge and looking at the Clean Aviation target, and performed a cross-correlation of the final topics and subtopics with their regional Smart Specialisation Strategy for Research & Innovation (RIS3) and the Clean Aviation Strategic Research and Innovation Agenda[32] (CA SRIA). The taxonomy has been further validated by means of interviews with 58 industrial and research organizations sampled from clusters' ecosystems of the ECARE partners.

The resulting ECARE Taxonomy is characterized by 24 topics presented in Table 4, to which 214 subtopics are associated. These topics represent the top-level technical domains in aircraft construction, enabling a first breakdown of aircraft technologies.

Each subtopic is associated with a description coming and updated from the existing definitions of the old ACARE and EDA taxonomies, or written ex-novo for new subtopics. The comprehensive ECARE Taxonomy is accessible on the ECARE Digital Platform, where users can explore it in detail. To enhance usability, a dedicated search engine has been developed, enabling users to easily identify easily their positioning within the taxonomy.

5.2 The ECARE taxonomy tool: To identify technical priorities

Origins and motivation: The foundation and development process of the taxonomy has been presented in the precedent section. This section focusses on the methodology and Excel tool developed in D2.1. To fulfil the need to map the technical priorities of funding bodies, this tool has been developed by the ECARE consortium. The tool can be used to narratively explain the general funding programs and opportunities for entities working on aeronautics, to identify the technological priorities and/or identify potential funding gaps, to provide data and information on each technical priority and to provide first drafts of technical roadmaps.

Methodology: Each funding authority wishing to use the ECARE taxonomy tool firstly needs to position itself on each taxonomy topic by selecting its priority: Low, Medium or High (Figure 6). Criteria have been proposed and defined to help each entity using the tool (Table 5). As second step, it is requested that the taxonomy user provides a justification on its chosen topics ranking (Figure 6), by providing information on the key players in the technological brick ecosystem, the existing funding programs, roadmaps and any information that would help to clarify the positioning.

[30] **Topic**: Technical domain
[31] **Subtopic**: Technological brick
[32] clean-aviation.eu/sites/default/files/2022-01/CAJU-GB-2021-12-16-SRIA_en.pdf, last accessed 29th of October 2024

Topics	ECARE taxonomy positioning result	Justify your positioning (Presentation of funding calls and roadmaps on the topics, highlight the SMEs and large companies presence on your territory, etc...)
A. Flight physics – A1. Aerodynamics		
A. Flight physics – A2. Thermal & Fluidynamics		
A. Flight physics – A3. Structural Mechanics & Smart Materials		

Figure 6: ECARE taxonomy tool second tab presentation to complete

Table 5: Criteria definition

	Definition of criteria
Low	No major large companies positioned; No significant SME supply chain; Small R&I and industrial activity; No roadmap and funding program on the topic;
Medium	Large companies emerging on the topic; Technology under development but not mature in your region; SME supply chain building up at early stage; Roadmap and funding programmes + few funding calls in the region;
High	Major large companies; Strong industrial positioning on the technology in the region; SME supply chain built on the technology; Roadmap and funding programmes targeting the technology; Important RTO and industry working on the technology;

Validation: The consortium has collected evaluations from the four pilot regions according to the methodology indicated before. The positioning of the four ECARE regions can be found in the appendices of D2.1.

The result: The Excel tool is available to facilitate the mapping and help a funding body to understand and, for example, present its key priorities and competences to CAJU and facilitate the potential signature of a Memorandum of Cooperation (MoC). To do so, following the completion of the technical priorities, the excel tool developed generates graphs and tables automatically in order to easily identify prioritised taxonomy topics (Figure 7). This tool can be used for the evaluation of the ecosystem and as a first draft of technical roadmap for strategic alignment.

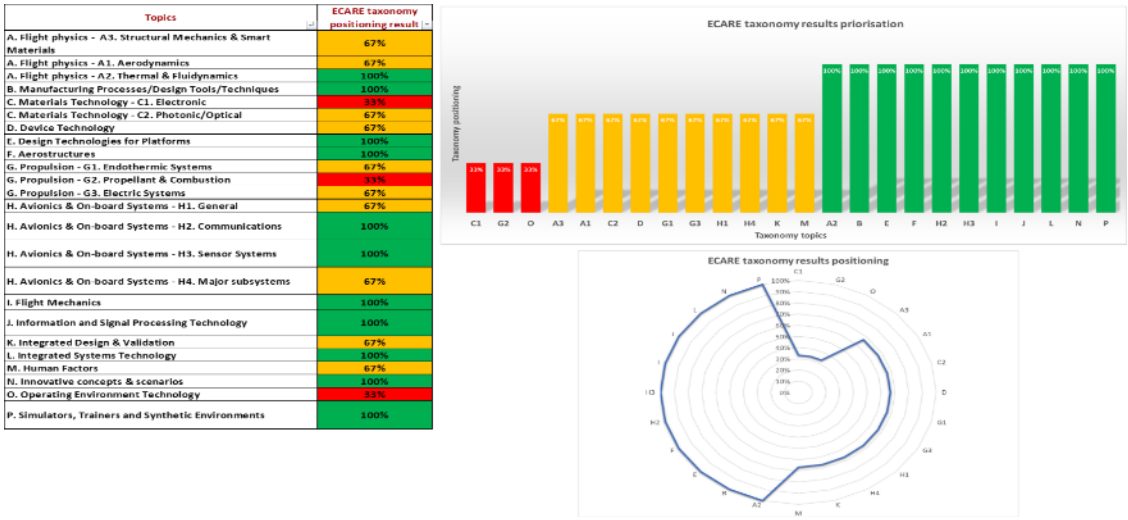


Figure 7: Graphs and tables presenting Campania positioning

5.3 The ECARE Digital Platform: A complete tool

Origins and motivation.

The ECARE project was conceived to address the pressing need for increased synergy and collaboration within the European aviation sector. **One of the main tools developed is the ECARE Digital Platform**, a comprehensive system designed to integrate various project outcomes such as taxonomy, data collection, mapping, and synergy recommendations**. It is intended to support the development and monitoring of**

potential synergies offering a centralised space for collaboration and information sharing for all involved parties, including stakeholders and funding bodies at regional, national and European level.

Additionally, the platform fosters collaboration and innovation by creating a centralized space where stakeholders can share data, develop partnerships, and pursue common goals. This approach not only enhances the effectiveness of resource allocation but also strengthens the overall network of participants, promoting a more integrated and efficient ecosystem within the European aviation sector.

Methodology

The ECARE Digital Platform was developed following a thorough methodology to ensure its effectiveness and usability. Initially, during the planning phase, the team concentrated on gathering and analysing user and technical requirements based on best practices from other online tools and recommendations from potential users. Additionally, the project conducted extensive data collection to populate the ECARE Digital Platform with initial data, the consortium collected information on funding opportunities, funded projects, and stakeholder competencies. All collected data was then integrated into the digital platform and linked to the ECARE taxonomy for interoperability. To understand industry perspectives on funding and synergy the consortium conducted interviews with industry experts to gain insights into specific needs for future users.

This approach allowed the development team to understand user needs and preferences, as well as define technical specifications, such as architecture, database design, integration capabilities, and security protocols, all while ensuring compliance with relevant regulations and standards like GDPR.

The deployment and migration were carefully planned, with the platform being launched in a production environment. A phased roll-out was implemented where necessary to ease user adoption and collect feedback, ensuring a smooth transition to the new system.

Validation

Before the public release of the digital platform, a comprehensive series of testing stages was completed to ensure its functionality and usability. Initially, a small group of users was given access to the platform to test all features and provide immediate feedback to the development team. Once this initial phase was completed, access was extended to the members of the ECARE consortium and their partners for further testing. Feedback from this broader group was collected to identify potential improvements and optimize the user experience.

Following the incorporation of critical updates based on this feedback, the platform was made available to ESG members, who were invited to actively use the platform and provide continuous feedback. To support ESG members in this process, a dedicated webinar was organized to present and train them on the platform's available features.

As a result of this thorough validation process, the digital platform is now a secure, stable, fast, and fully updated tool. It is publicly available to all interested users for information retrieval and collaborative work. Furthermore, the platform is designed with flexibility in mind, allowing for future upgrades and the addition of new functionalities as needed.

The resulting ECARE Digital Platform

The ECARE platform is a comprehensive resource designed to support innovation across various sectors. It serves as a centralized hub for a diverse range of users, each with unique needs.

1) **For entities (SMEs, large companies, RTOs, universities):** ECARE offers a one-stop platform with a comprehensive overview of funding opportunities and funded projects at the European,

national and regional levels, and stakeholders' competences. The platform also facilitates the discovery of potential partners and provides insights into the latest technological trends.

2) **For funding bodies (regional, national, and European funding bodies):** ECARE serves as a valuable tool for managing and tracking past and current funded projects. It enables users to identify gaps and overlaps, enhance funding effectiveness, access downloadable data for analysis and facilitate cross-border collaboration.
3) **For clusters and networks (For example EEN or EACP)**: ECARE proposes an overview of funding opportunities and funded projects, facilitates collaboration among cluster members, provides insights of potential partners for collaborative project, and inspires innovation through exposure to diverse projects and trends of competences.

Taxonomy as a core element

The **ECARE taxonomy** is a fundamental component for all types of content and items on the digital platform. This includes users and entities with their profiles, workgroups, and databases containing stakeholder competences, funding opportunities, and funded projects. **The taxonomy streamlines the process for users to search for and understand information, enabling the extraction of valuable insights and data through a variety of integrated platform features**. A dedicated section on the platform allows users to learn more about this specific taxonomy, access detailed information for each subtopic within every topic, and search for content based on specific topics, either in totality or by content type.

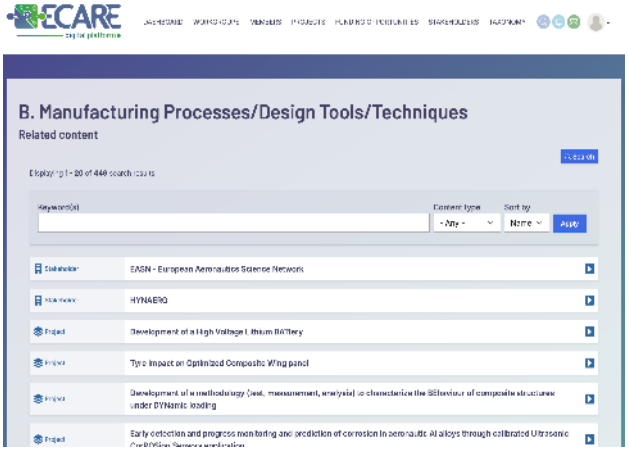


Figure 8. Taxonomy section on ECARE digital platform

The **Taxonomy** section provides not only information about the ECARE taxonomy but also allows users to search all database content by topic. Content searches can be conducted using keywords, content type (funding opportunities, funded project, stakeholder competence), and sorted by title, type, or date added to the ECARE Digital Platform.

Comprehensive databases and dynamic data mapping on the Digital Platform

The databases included in the ECARE Digital Platform are designed with usability in mind, making it easy for users to collect, manage, and display data. Platform members can access and search for information through a user-friendly interface and can also easily add new entries using specially designed forms. These new entries are automatically analyzed and translated by the platform software when necessary and categorized according to the ECARE taxonomy.

The platform features three main databases containing information on funding opportunities, funded R&D&I projects, and stakeholder competences, an additional supporting member database complement these main ones.

With information collected on technical topics (funding opportunities, funded projects, stakeholder competences) and technical expertise (members), the mapping process on the platform is fully automated. Data is displayed in a list format, and each category features a dynamically generated chart that visually represents the mapping based on the ECARE taxonomy. This dynamic and multifunctional environment allows users to search for information based on specific criteria, with both the list and chart updating to reflect the filtered results.

The funding opportunities database provides detailed information on each call, including its title, description, deadlines, budget, eligibility, funding body, TRL levels, and type of funding (regional, national, European), and if not European, the specific country or region. Each call entry is tagged with one or more technical topics based on the ECARE taxonomy and includes a link for more information. Calls are listed by deadline and title, with a visual chart presenting the mapping of funding opportunities. Users can search by title, type, or technical topic, and sort results by deadline, name, or type.

The funded projects section stores information such as the project title and acronym, a description of its objectives and outcomes, the coordinating entity and consortium members, the starting year and duration, as well as the starting and ending TRL. It also includes funding details like the funding body and budget, the amount of public funding, the type of project (regional, national, European), and the country or region if not European. Each project entry is associated with one or more technical topics from the ECARE taxonomy and provides a link for further information. The dynamic chart at the top of the page represents the overall mapping of registered projects by ECARE taxonomy topic. Searches can be conducted by title, project type (regional, national, European) or technical topic. Sorting options include starting year, title, or country/region. The results of these searches generate new mappings and listings of information, helping users understand and derive useful insights and conclusions.

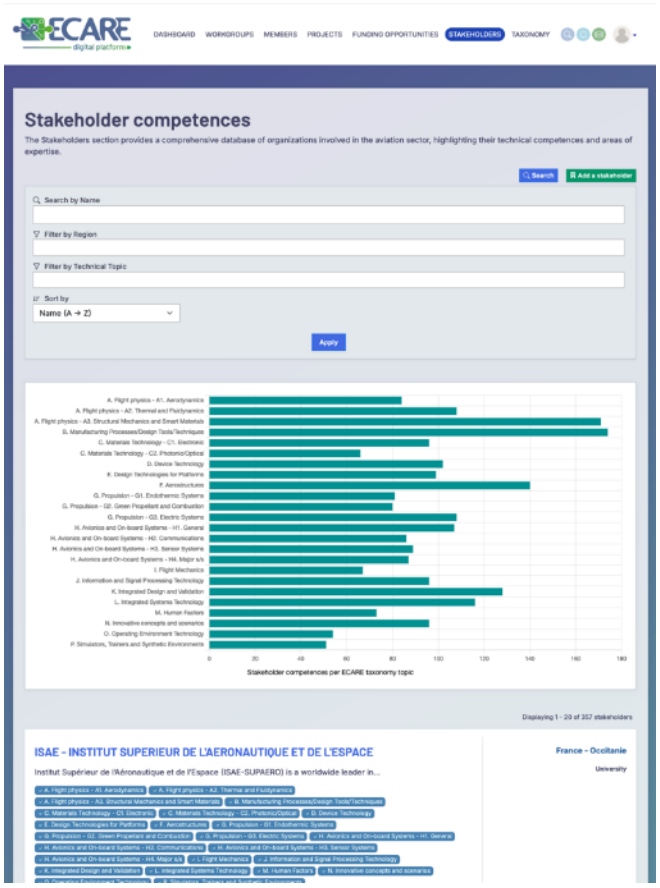


Figure 9: Stakeholder competences section on ECARE digital platform

The stakeholder competences section stores information about each stakeholder, including the organization's name and type, a brief description, location, and region. Similar to other platform content, it also includes one or more technical topics based on the ECARE taxonomy that the organization is involved with. The accompanying chart visually represents the overall mapping of stakeholder competences across Europe based on database entries. Users can search by organization name, country or region, and technical topic, and sort the displayed information by organization name or type. The search results dynamically generate a new mapping and listing of information tailored to the user's inputs.

The initial information in these databases was sourced from the mapping process conducted as part of the project, and new data is continuously added by platform members. **It also provides a standardized format for data, facilitating its use by other funding bodies to promote homogenization and interoperability.**

Platform members and networking opportunities

Members are an important element of the ECARE Digital Platform, serving as the foundation for building synergies and fostering collaboration. As a publicly accessible online tool, the platform allows anyone interested to create an account, whether as an individual user or as an entity. Profiles can include optional information such as the user's first and last name (or organization name), country or region, technical expertise, an introduction of the organization or user, and a link to other platforms for more details. The platform facilitates direct communication between users, either individually or in groups, through an integrated messaging service.

The Members section displays a comprehensive list of all platform members and features an embedded map that visually represents members' locations by country or region (Figure 10). Users can search for members by name, technical expertise, and country or region, with sorting options available by name. This functionality enhances networking opportunities, enabling users to connect and collaborate effectively.

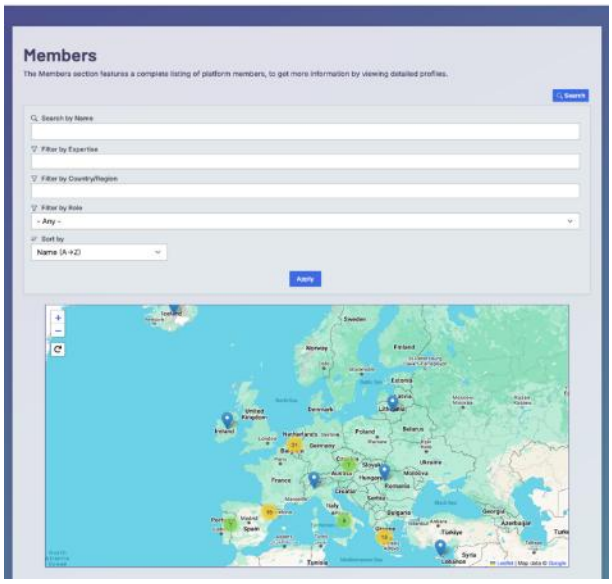


Figure 10: Members section on ECARE digital platform

Facilitating collaboration and synergies

To foster collaboration and build synergies, the ECARE Digital Platform has developed a comprehensive ecosystem for collaborative work. This ecosystem includes features for discussions, file sharing, and event announcements. Members can create or join **workgroups** with varying levels of security and access, depending on their needs.

There are three types of workgroups available:

- **Private workgroups**: These are restricted to specific members and require approval from group administrators to join, ensuring a controlled and secure environment.
- **Open workgroups**: These are accessible to all platform members who wish to participate. Joining these groups is a straightforward process, providing an open space for collaboration.
- **Public workgroups**: In these groups, members do not need to formally join to participate. However, to maintain security, the functionalities are limited to discussions only, functioning as public forums.

Within a workgroup, members have access to various collaborative features and tools. The group page includes a title, a description of the group's purpose, relevant technical topics, the creation date, and the member who created it. Below this header, **there are three main sections: Discussion Topics, Documents, and Events.**

- **Discussion Topics**: This section allows for a threaded exchange of messages where any group member can initiate a topic, and others can reply or comment, creating a dynamic discussion space.
- **Documents**: This area is dedicated to shared files within the group. It includes information such as the document title, a possible description, the user who uploaded it, and the date it was shared. Members can download files by clicking a button next to each document.

- **Events**: This section provides details about important events that are relevant to the group's purpose. Information includes the event title, description, location, and date.

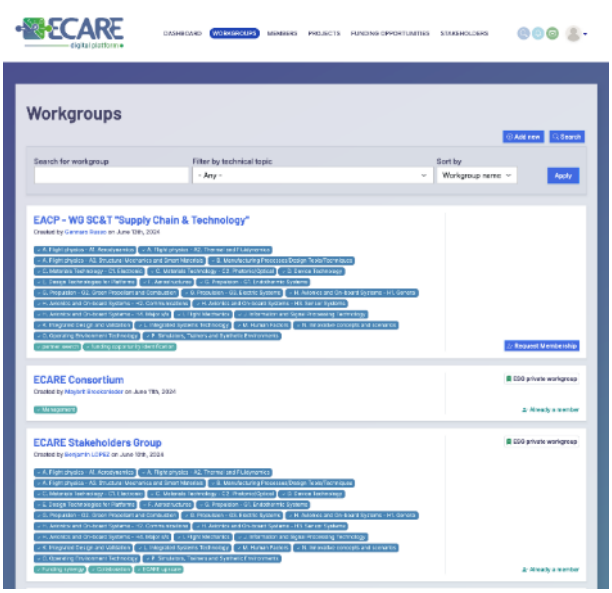


Figure 11: Workgroups section on ECARE digital platform

Figure 12: Workgroup page on ECARE digital platform

On the right side of the page (Figure 12), members can see a list of all group members and identify administrators through special markers. At the top right, there is a list of actions available to members, such as starting a new discussion, sharing a document, or adding an event. This setup ensures that all collaborative efforts are streamlined and effective.

Insights and knowledge sharing

The Aviation Insights section of the ECARE Digital Platform serves as a dynamic space for knowledge sharing and collaboration within the aviation community. This section encourages members to propose articles highlighting research findings, project achievements, and innovative solutions. By doing so, it not only enhances the visibility of these contributions but also creates a valuable knowledge repository accessible to all members. It also enables users to share new information about funding opportunities, funded projects, and technological advancements. This fosters stronger engagement among stakeholders and promotes the dissemination of innovations within the aviation sector.

The ECARE Digital Platform serves as a comprehensive tool for accessing a wide array of information databases, facilitating collaboration, and fostering synergies within the aeronautics community. Users can seamlessly explore detailed databases, conduct searches for specific information, and connect with other members to enhance knowledge-sharing and innovation. The platform's mapping features provide a visual representation of data, helping users identify opportunities for collaboration and potential partnerships across various sectors. Furthermore, the platform's continuously expanding databases ensure that the information remains up-to-date and relevant. For a detailed understanding of how to utilize these features and maximize experience, a detailed user guide is available.

Conclusion

The ECARE project has provided a clear and structured framework for enhancing collaboration between funding bodies at regional, national, and European levels, with the ultimate goal of driving innovation and achieving sustainability in the aviation sector.

Through a comprehensive six-phase pathway, the project has outlined key methodologies and tools that can be adopted by stakeholders to maximize the impact of public funding, streamline processes, and ensure alignment with Clean Aviation's strategic objectives. **The identification of 18 synergy mechanisms, along with ECARE recommendations, offers a replicable model for regions and countries to follow**. These synergies ensure that stakeholders are not only able to access funding but also able to participate in larger, cross-border initiatives that will advance the decarbonization of the aviation sector.

One of the core contributions of ECARE is the introduction of the ECARE Taxonomy and the ECARE Digital Platform, both of which serve as vital tools for mapping the aeronautical landscape. These resources allow stakeholders to align their projects and funding opportunities, improving transparency and facilitating better coordination. The Taxonomy, in particular, plays a crucial role in enabling comparisons across funding opportunities, funded projects, and competencies at multiple levels.

A cornerstone of the ECARE project is its structured implementation six-phase pathway framework designed to guide stakeholders from ecosystem evaluation to the emergence of impactful projects. This pathway ensures that the 18 synergies are not only conceptual but actionable, providing a clear roadmap for aligning strategies, harmonizing processes, and fostering collaboration. Each phase of the pathway is intricately linked to the 18 synergies and ECARE toolbox identified within the handbook, which act as practical tools and mechanisms to operationalize this vision. For instance, the early phases focus on evaluating ecosystems and aligning roadmaps, directly corresponding to synergies such as Synergy A ([…] Alignment of technical roadmaps by funding bodies) and Synergy B ([…] Aligned funding programs at regional, national and European level). Later phases emphasize harmonization and communication, tying into mechanisms like Synergy D (Centralized tool which visualizes data […] at regional, national and European level) and Synergy H (Regular meetings […] between […] funding bodies). Finally, the pathway culminates in the emergence of innovative projects and the enhancement of funding mechanisms, facilitated by synergies such a Synergy L (Cluster issuing a call of interest […]). By following this structured approach and leveraging these synergies, stakeholders are equipped to achieve tangible outcomes, bridging gaps between funding bodies and accelerating the development of sustainable aviation technologies. For a concise summary of each phase of the implementation pathway and their connection to the synergies, please refer to the table that follows, which provides a clear overview of the key activities, stakeholders involved, tool to use and corresponding synergy mechanisms.

In conclusion, the ECARE Handbook for Synergies offers both a strategic roadmap and practical toolkit for stakeholders committed to advancing sustainable aviation. By leveraging the methodologies, tools, and synergies outlined in this document, stakeholders can not only improve the effectiveness of public funding but also contribute to the realization of Clean Aviation's vision for a decarbonized and innovative aviation sector.

Table 6: Summary of the ECARE six-phase pathway to synergies

Title	Description	Who	Synergy mechanism	ECARE toolbox
Phase 1 **Evaluation of the ecosystem**	It involves assessing the aeronautic landscape to identify key stakeholders with the use of ECARE tools (ECARE taxonomy, mappings of funding opportunities, funded projects and stakeholders' competences). A region or country typically initiates this process and can collaborate with an aeronautic or cluster.	Funding bodies Clusters Stakeholders	Synergy D	The ECARE Taxonomy ECARE taxonomy tool ECARE Digital Platform
Phase 2 **Strategic alignment**	Strategic alignment between funding bodies requires ongoing dialogue and collaboration to harmonize strategies, roadmaps, and priorities across regional, national, and European levels. This collaborative process involves assessing current strategies, identifying gaps and opportunities, and adjusting roadmaps to ensure maximum impact and efficient resource allocation.	Funding bodies Clusters Stakeholders	Synergy A & B	The ECARE Taxonomy ECARE taxonomy tool ECARE Digital Platform
Phase 3 **Regular exchange and joint communications**	ECARE encourages regular meetings between at least two funding bodies within a country to foster collaboration. These meetings aim to stimulate communications and collaborations, identify and implement joint actions, such as co-funding projects, joint information days, sharing information, and coordinating funding programs.	Funding bodies Clusters Stakeholders	Synergy H, I & J	ECARE Digital Platform
Phase 4 **Harmonisation of processes**	Harmonizing research funding processes involves standardizing application and review procedures, aligning funding cycles, and utilizing unified IT platforms. This aims to reduce administrative burdens, facilitate data sharing, and ensure consistent evaluation across regional, national, and European levels.	Funding bodies	Synergy C, D, E & F	ECARE Digital Platform
Phase 5 **Emergence of projects**	It focuses on aligning projects with industry needs through a collaborative process involving funding bodies, clusters, and industrials. By identifying technical needs and launching calls for interest and specific calls, funding bodies can stimulate the development of the local supply chain in sustainable aviation technologies.	Funding bodies Clusters Stakeholders	Synergy K, L, M, N, O, P, Q & R	The ECARE Taxonomy ECARE taxonomy tool ECARE Digital Platform
Phase 6 **Improvement of existing mechanisms**	Funding bodies at all levels can initiate this step by providing supplemental funding to projects that have already undergone evaluation. This benefits entities or consortia seeking funding after rejection or needing extra funds to continue their projects.	Funding bodies Clusters	Synergy F, G & R	ECARE Digital Platform