

D3.2 – Gap Analysis

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Abstract

This document analyses funding gaps in the aeronautical sector in Europe by comparing characteristics of the funding programmes and calls at regional, national and European level, reference is made to the four pilot regions of the project: Nouvelle-Aquitaine and Occitanie in France, Campania in Italy, and Hamburg in Germany.

The ECARE consortium made systematic use of: (i) data collected on mapping of calls, funded projects and stakeholders' competences, which are reported in D2.1; (ii) needs of regional stakeholder identified during interviews, and (iii) information on approaches to funding obtained during the execution of a first series of national workshops with regional and national funding bodies are reported in D3.1.

The analyses by country of all the data and elements mentioned above have taken into account the sensitivity of funding bodies to stakeholders needs, perceptions about potential synergies, recognition of gaps and existing barriers separately. Such analysis allowed to identify and describe a first list of 18 potential synergy mechanisms among the four pilot regions and the Clean Aviation Joint Undertaking (CA JU) programme. These preliminary results will be the starting point of the ECARE Transnational Workshop.

Keywords

Gaps, needs, funding, synergies, interviews with aeronautical stakeholders

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Table of acronyms

ADEME	French Agency for environment and energy control
ADER	Actions pour le Développement des Entreprises Régionales de sous-traitance = Actions for the Development of Regional Subcontracting Companies
AV	Aerospace Valley
BPI France	Public Investment Bank of France
CA	Clean Aviation
CAJU	Clean Aviation Joint Undertaking
CAPEX	Capacity Expenditures
CEIP	Piemonte Agency Aerospace
CORAC	Civil Aviation Research Council
CS23	Certification Specifications 23
DAC	District of Campania
DGA	Direction Générale de l'Armement = The Directorate General of Armaments
DGAC	Civil Aviation Authority
DLR	German Aerospace Center
DTA	Distretto Tecnologico Aerospaziale
EASN-TIS	Association of the European Academia active in Aeronautics research
EC	European Commission
ECARE	European Clean Aviation Regional Ecosystem
EEN	Euterprise Europe Network
ENEA	Alternative Energy National Agency
ESG	ECARE stakeholder Group
EU	European Union
HAv	Hamburg Aviation
IPCEI	Important Project of Common European Interest
LAC	Lombardia Aerospace Cluster
MoC	Memorandum of Cooperation
NWS	National WorkShop
ONERA	Office national d'études et de recherches aérospatiales = French national aerospace research centre
PIC	Participation Identification Code
Q&A	Questions and answers
R&D	Research and Development
R&D&I	Research and Development and Innovation
RIS3	Research and Innovation Smart Specialisation Strategy
RTO	Research and Technology Organisation
SESAR	Single European Sky ATM Research
SME	Small and Medium Enterprise

SRG	State representating group
TRL	Technology Readiness Level
WP	Work Package
ADEME	French Agency for environment and energy control

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1. Introduction

The ECARE project, funded by Clean Aviation (CA), has the primary objective of clarifying the landscape of the regional and national innovation roadmaps and the funding opportunities for aeronautical stakeholders in order to create synergies between the parties. 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. As a response to these requirements, the ECARE project will develop and disseminate the methodologies to create synergy mechanisms which are applicable to all EU aeronautical regions. These methodologies are initially 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.

According to the grant agreement, deliverable D3.2 is dedicated to the "Funding gap analysis in the Pilot countries and list of potential synergy mechanisms". **This document identifies funding gaps in the aeronautical sector** based on the list of needs reported in D3.1 and using the data collected and reported in D2.1 (mapping of calls, funded projects and stakeholders competences).

The ECARE consortium, using its knowledge, also considers and analyses the regional, national, and European funding characteristics of the four pilot regions: Nouvelle-Aquitaine and Occitanie in France, Campania in Italy, and Hamburg in Germany.

Areas of commonalities with CAJU policy and prioritization of topics has been studied in D2.1 and analysed in the present deliverable. Particular attention will be given to regional RIS3 starting from the partner clusters' regions and extending wherever possible within the three Pilot countries to identify potential needs and gaps.

ECARE conducted a first series of national workshops with regional and national funding bodies to gain insights into their funding approaches, reported in D3.1 This document analyses the results of these workshops, considering the sensitivity of funding bodies to stakeholder needs, their feelings about potential synergies, and their acknowledgement of existing barriers and gaps separately for each country.

Finally, the document identifies and describes a list of potential synergy mechanisms among the four pilot regions and the CAJU programme.

2. ECARE primary inputs

This section describes the initial data that the consortium used to identify gaps and synergy mechanisms.

2.1. Overview of Funding Bodies in Aeronautics for Pilot Countries

To identify the gaps, commonalities, and priorities between the funding programs and roadmaps of the various funding bodies, this section presents and analyses the main funding bodies in aeronautics for each pilot country.

2.1.1. France

In France, the main funding body for aeronautics is the DGAC (French Civil Aviation Authority) via the Civil Aviation Research Council (CORAC).

CORAC is a government-industry body dedicated to setting up the sector's national research programme, which has since been imitated many times in France in other industrial sectors (space, automotive, among others), as well as abroad.

CORAC is chaired by the Minister for Transport and brings together, on an annual basis, the chairmen of the companies (Airbus, Safran, Dassault, Thales) and the heads of the administrations concerned for major decisions on policy and budgets regarding the aeronautics sector. **A steering committee and various thematic committees meet every month** to build an updated research program based on high-level objectives set around the major axes of the environment, security and competitiveness. These meetings are composed of the DGAC, the DGA (The Directorate General of Armaments), ONERA (Office national d'études et de recherches aérospatiales = French national aerospace research centre), industrial players are also associated with national operators such as airlines and airports.

CORAC was set up to coordinate French aerospace research on aeronautics for greater efficiency. Its main strength is that the whole industry stakeholders are represented into the CORAC: aircraft manufacturers, engine manufacturers, systems and equipment suppliers, government departments, Cluster, SMEs etc. **CORAC's roadmap is majorly structured around three strategic “revolution” areas¹:**

- **The energy revolution:** The roadmap provides for major progress in energy efficiency for the next generation of aircraft, through action across all disciplines: configurations, aerodynamics, aerostructures, engines, equipment. It also organizes the selection of the most promising carbon-free energy sources and the development of technologies enabling their use on board.
- **The operations revolution:** Advances in digital technology and connectivity, combined with the modernization of air traffic management, are levers for the transformation of air transport: for a new significant leap in flight safety that will be brought in particular by crew assistance functions, for a significant reduction in the environmental footprint of air transport.
- **The competitiveness revolution:** Future programs need to rely on a robust and responsive supply chain and shorter development cycles. It is therefore essential to increase the competitiveness of the aeronautics sector by investing massively in the modernization of production tools and digital continuity at all levels of the supplier chain.

Its deliverables take the form of demonstrators aimed at hastening the incorporation of the technology advances of the aerospace of the future.

CORAC relies on its knowledge of industrial players, technological challenges, to foster the emergence of innovative projects. On the aims, CORAC also collaborate with all other stakeholders as clusters and business networks. Based on the expertise of industrial leaders and engaging with all relevant stakeholders, CORAC works towards identifying main initiatives. This collaborative approach makes it possible to identify opportunities, pool resources and develop strategic partnerships, which are essential to the identification and implementation of ambitious, successful projects. **For private companies, the rate of funding is 50%, while for RTOs and research universities, the rate of funding is 100%. The assistance is provided in the form of grants.**

¹ [Feuille de route - CORAC Aéro Recherche - Aéronautique Civile : CORAC Aéro Recherche – Aéronautique Civile \(aerorecherchecorac.com\)](http://aerorecherchecorac.com)

In terms of funding envelope, CORAC will be able to set up an R&D funding program of up to 300 M€ per year from 2024 on the global topic of low carbon aviation.

At national level, in addition to CORAC's actions, other French funding bodies are involved on low carbon aviation challenges, fully in synergy with CORAC's actions, in particular:

- **BPI France², the French Public Investment Bank**, funds emerging R&D&I projects from all sectors and has funded light aircraft projects (CS23 - aircraft with fewer than 19 seats) in its call for proposals, "Producing in France Low-Carbon Aircraft". BPI France has also launched other calls for less mature technological building blocks, such as on-board artificial intelligence and new technologies for the factory of the future.

For an SME, the rate of funding will vary from 25 to 50% while **for an ISE and large company** they will be between 15 and 30%. **As for RTOs and research universities**, the rate of funding will be 100% in the form of grants. The rate of funding from which a company can benefit are given as an indication which will be determined during proposal examination.

The assistance is provided in the form of grants and repayable advances for companies, distributed in the general case according to a ratio of 60% grants and 40% repayable advances.

- **ADEME³ (French Agency for environment and energy control)** provides funding for R&D&I in technologies with a positive impact on low-carbon mobility that are not exclusively dedicated to aeronautics (e.g. hydrogen technologies).

Funding for R&D&I projects is done through grants and repayable advance. This choice between grants and repayable advance will depend on the nature of the work financed, the nature of the beneficiaries and the amount of aid corresponding to the development of the products, processes or services.

The maximum intensity of ADEME rate of funding varies depending on the type of beneficiary and the type of research. For an ISE & a large company this varies from experimental development at 25% to fundamental research which can be financed at 50%. For SMEs, this starts at 45% for experimental development up to 70% for fundamental research. Finally, RTOs and research universities are 100% funded.

- **Regional level:** At regional level, the definition of thematic priorities varies from one region to another, but these definitions are always linked to specific territorial characteristics. Regarding the Regional Councils of Occitanie and Nouvelle-Aquitaine, they define their priorities in their respective Green plane Program⁴ (for Occitanie Region) and Maryse Bastié Program⁵ (for Nouvelle Aquitaine Region) based on the strengths and weaknesses of their respective regional ecosystems. As described in D2.1, the themes in the taxonomy related to the skills present in the regions are well covered by regional funding tools with some strengths and weaknesses but without any gaps regarding the technology's needs.

The maximum intensity of regions rate of funding varies depending on the type of beneficiary and the type of research. The rate of funding varies from 25% for ISE and large companies to 50% for

² <https://www.bpifrance.fr/>

³ <https://agirpoulatransition.ademe.fr/entreprises/aides-financieres>

⁴ <https://www.laregion.fr/L-Occitanie-moteur-de-l-avion-vert>

⁵ https://www.adi-na.fr/wp-content/uploads/2021/02/2019__252__SP_deliberation_planMaryseBastie__pdf_.pdf

SMEs and 100% for RTOs and research universities. The regions promote co-financing as for certain calls the aid may have a leverage effect on other public funding (European ERDF funds, BPI aid, CORAC aid, etc.).

2.1.2. Germany

The main funding program in aeronautics in Germany is called ‘Luftfahrtforschungsprogramm’ (LuFo). It is funded by the German Federal Ministry for Economic Affairs and Climate Action (BMWK). Research funding is based on the goals of the ACARE vision 2020 (ACARE = Advisory Council for Aviation Research and Innovation in Europe) and Flightpath 2050. The aim is, among other things, to maintain the acceptance of aviation by reducing emissions and aircraft noise⁶. LuFo is currently running for the 6th time, after its inception in 1995⁷. The current phase started in 2020 and will end in 2024. The department ‘Programme Management Agency for Aviation Research’ of the German Aerospace Center (DLR) is responsible for the implementation of LuFo.

The main selection criteria for funding in LuFo are the technological excellence of the projects and a viable exploitation perspective in Germany. Funding is provided in the form of a grant. **The rate of funding for companies** is up to 50% of the eligible costs, for small and medium-sized enterprises (SMEs) up to 65% of the eligible costs and for research universities and RTOs up to 100% of the eligible expenses⁸. **In terms of funding envelope, LuFo should be able to set up a yearly funding program up to 200 M€.**

The current phase of LuFo is granted on the base of five key topics:

- **Eco-efficient flying and disruptive technologies:** For science initiatives and projects for academic research into technologies with an application period of 2025-2050. The funding spectrum encompasses all disciplines of aviation. The overarching research goal is to significantly reduce resource consumption and maintain safety in aviation.
- **SME:** For innovative small and medium-sized enterprises (SMEs) in the aviation industry. The submitted ideas are not competing with other key topics. This is intended to give interested SMEs the opportunity to become active in product niches that are attractive to them.
- **Technology:** For applied research projects in the following areas: innovative, environmentally friendly and resource-efficient and cost-efficient manufacturing, maintenance and repair processes for all maintenance and repair processes for all types of aircraft, including rotorcraft with their specific challenges.
- **Intelligent process technologies for development and manufacturing (Industry 4.0/Artificial Intelligence):** For R&D projects that use digital technologies for the vertical, horizontal and continuous integration of data for specific challenges in the aviation industry.
- **(Hybrid) Electric manned flight:** For R&D projects which deal with topics of manned electric aviation, ranging from urban mobility and general aviation aircraft to regional and short-haul aircraft.

⁶ https://www.dlr.de/pt-lf/Portaldata/50/Resources/dokumente/lufo-vi/Flyer_PT-LUFO_Web.pdf, last accessed 2nd of November 2023

⁷ https://www.dlr.de/pt-lf/desktopdefault.aspx/tabid-8362/14387_read-8356/, last accessed 2nd of November 2023

⁸ https://www.dlr.de/pt-lf/Portaldata/50/Resources/dokumente/lufo-vi/Flyer_PT-LUFO_Web.pdf, last accessed 2nd of November 2023

At national level, in addition to Lufo’s actions, other German funding bodies are involved on low carbon aviation challenges, fully in synergy with Lufo’s actions, in particular:

- **‘Luftfahrzeugausrüsterprogramm’ is another funding program supported by BMWK as national funding body** to strengthen OEMs and the supply chain. Research and technology projects of companies in the aerospace industry, including engine manufacturers, in civil aviation in Germany are supported by means of loans to limit development risks. A partial financing of development costs, up to a maximum of 40 percent of eligible costs, is provided through interest-bearing loans, some of which are conditionally repayable.⁹
- **In Hamburg region, the Hamburg Office of Economic Affairs and Innovation introduced the funding program ‘GATE: Green Aviation Technologies’** in 2021. This program aims to strengthen the innovative capacity of small and medium-sized enterprises and research institutions in a targeted and effective manner, while supporting research into technologies and processes that can reduce the environmental footprint of the aviation industry. Six projects acquired funding with a total volume of four million Euros. GATE is implemented by the Hamburg Investment and Development Bank (IFB Hamburg), which acts as the regional funding body¹⁰. The funding program GATE was developed based on the Green Aviation Technology Roadmap Hamburg Aviation drew up together with the cluster’s member companies. In particular, the following technology fields from the Green Aviation Technology Roadmap were prioritized for funding: (1) Sustainable aircraft systems and production; (2) Lightweight, modular and integrated aircraft cabin; (3) Sustainable aircraft operations - maintenance and services; (4) Sustainable operation of airports¹¹ ; (5) Development of hydrogen-related research infrastructures for short and medium haul aircraft.

This funding program underscores Hamburg's commitment to a cleaner, more sustainable future for the aviation sector.

2.1.3. Italy

The main national body for funding research in all sectors is the Italian Ministry of University and Research (MUR)¹². Its main instrument is the National Research Plan (Piano Nazionale per la Ricerca, PNR¹³). It is the document that guides research policies in Italy, it identifies priorities, objectives and actions aimed at supporting the coherence, efficiency and effectiveness of the national research system. With the PNR 2021-27, the Ministry of University and Research aims to tackle the great global challenges, together with the pressing challenges for the national territories. The objective is to implement strategic, participatory and dynamic planning, capable of contributing to the sustainable development of society and implement its emergency needs. The PNR 2021-27 intends to promote positive changes by leveraging basic and applied research and policies that make use of the directionality of innovation. The PNR 2021-27¹⁴ is coherently linked to Horizon Europe, by the coinciding time frame to give continuity to the strategic

⁹ <https://www.bmwk.de/Redaktion/DE/Artikel/Technologie/luftfahrttechnologien-03.html>, last accessed 2nd of November 2023

¹⁰ <https://www.ifbhh.de/presse/meldung/hamburg-stellt-projekte-fuer-nachhaltigere-luftfahrt-vor>, last accessed 2nd of November 2023

¹¹ <https://www.ifbhh.de/presse/meldung/hamburg-stellt-projekte-fuer-nachhaltigere-luftfahrt-vor>, last accessed 2nd of November 2023

¹² <https://www.mur.gov.it/it>

¹³ <https://www.mur.gov.it/it/aree-tematiche/ricerca/programmazione/programma-nazionale-la-ricerca>

¹⁴ <https://www.mur.gov.it/sites/default/files/2021-05/PNR2021-2027.pdf>

vision of national programming and, in aligning with European programming, insert complementary elements aimed at promoting interventions not considered in Horizon Europe.

PNR 2021-27 identifies 28 areas of intervention, among which the cluster “Digital, Industry, Aerospace” include a dedicated line to “Aerospace”.

The latter gives attention to:

- Next generation rotorcrafts,
- Reduced environmental impact and increased well-being in aeronautics,
- Unmanned autonomous aircrafts,
- Intelligent structures, supermaterials and innovative technologies,
- Air traffic control,
- Suborbital and hypersonic flight, stratospheric platforms, re-entry,

The corresponding funding dimension for the period 2021-27 is in the order of 500 M€ per year for areas of direct and indirect aerospace interest. These funds are typically dedicated to pre-competitive activities, e.g. with TRL ranging between 3 and 6, covering thus R&D&I and industrialization actions. They are assigned under the main principle of co-financing or Public Private Partnership, assuming that who ask for supporting funds is concretely interested in the corresponding projects and so is interested to economically contributes to its implementation. The maximum intensity of national rate of funding varies depending on the type of beneficiary and the type of research. The rate of funding varies from 35% for large companies and ISE to 60% for SMEs, with the possibility to rise up to 50% and 80% respectively by means of rewards on the basis of specific conditions defined on a case-by-case basis. RTOs and research universities can benefit of 100% costs coverage. Most of the funding are assigned by means of grant.

At national level, in addition to MUR’s actions, other Italian funding bodies are involved on low carbon aviation challenges, fully in synergy with MUR’s actions, in particular:

- **The National Authority for Civil Aviation (ENAC)**¹⁵ has a dedicated research program funded by two ministries: MIMS (Ministry of Infrastructure and Transport)¹⁶ and MATTM (Ministry of the Environment and Energy Security)¹⁷. The strategic areas are: Environment, Aerospace (suborbital flight, space), Advanced Air Mobility (including Urban Air Mobility), Cyber Security, Safety and airport infrastructure. The action is mainly, but not exclusively, dedicated to SMEs, RTOs and research universities, with grant co-funding policies very similar to MUR.
- **The National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)**¹⁸ is a public law body aimed at research, technological innovation and the provision of advanced services to businesses, public administration and citizens in the sectors of energy, environment and sustainable economic development.
- **PRORA, the National Aerospace Research Programme**¹⁹, managed by CIRA²⁰ under the supervision of MUR is devoted to fund specific activities run by CIRA with the involvement of different stakeholders by mean of open calls. Not being a funding programme in favor of

¹⁵ <https://www.enac.gov.it/>

¹⁶ <https://performance.gov.it/pa/10>

¹⁷ <https://www.mase.gov.it/pagina/mattm>

¹⁸ <https://www.enea.it/it/>

¹⁹ <https://www.mur.gov.it/it/aree-tematiche/ricerca/programmazione/programma-nazionale-di-ricerche-aerospaziali>

²⁰ <https://www.cira.it/>

companies but a programme to support the development of specific projects, the cost coverage is set at 100%.

- **The Regione Campania government**²¹ has two main bodies providing funds for research and innovation:
 - Department of Research, Innovation and Start up
 - Department of Productive Activities - Work - State Property and Heritage

The main planning instrument is the Research and Innovation Spurt Specialization Strategy (RIS3)²², which is built in coordination with national strategies as well as European ones. It is focused on 7 technological domains, among them **the “Aerospace” domain which is structured in 5 technological trajectories**: (1) Smart manufacturing; (2) New air mobility, safety and defense (3) Aeronautical technologies with low environmental impact; (4) Space economy; (5) Advanced systems and materials.

Priorities are periodically revised and redefined in alignment with new European framework programme definition and implementation. The review process is mainly based on the consultation with all regional stakeholders among which the Campania Aerospace District DAC covers by far the most important role.

The maximum intensity of regions aid varies depending on the type of beneficiary and the type of research. The rate of funding varies depending on the type of beneficiary and the type of research, from 35% for large companies and ISE to 60% for SMEs, with the possibility to rise up to 50% and 80% respectively by means of rewards on the basis of specific conditions defined on a case-by-case basis. RTOs and research universities can benefit of 100% costs coverage.

The overall regional funding dimension for the period 2021-27 is in the order of 50 M€ per year.

2.1.4. Conclusion

This overview of funding bodies reveals that there is no significant gap in the thematic coverage of funding opportunities at national and regional levels in the three countries. On the contrary, there is a considerable overlap between the various funding mechanisms and bodies. **Therefore, to identify gaps and leverage synergies, ECARE must explore other levers**, such as for example the TRLs coverage or the type of entities funded. However, the redundancies observed in terms of thematic coverage will be a criterion to be considered in the development of synergetic mechanisms

2.2. Analysis of mappings inputs (calls, funded projects and stakeholder competences)

An important result of the ECARE project are mappings of the calls, funded projects and stakeholder competences to get an overview of the European funding landscape. The consortium has developed a variety of tools to complete the mappings. These tools have been explained in D2.1. preliminary results of the mappings have been provided, using data collected by the four pilot regions Nouvelle-Aquitaine, Occitanie in France, Campania in Italy and Hamburg in Germany. For this deliverable, the data was used to identify gaps in the funding landscape, and therefore add to the findings of the interviews and national workshops.

²¹ <https://www.regione.campania.it/>

²² https://www.agenziacoesione.gov.it/wp-content/uploads/2022/12/RIS3-Campania-2021-2027_29092022-.pdf

2.2.1. Mapping of funded projects

For the mapping of projects, a total of 246 funded projects were listed. The analysis focused on using the projects Technology Readiness Level (TRL) data to identify potential gaps in funding. The accompanying diagram in Figure 2 visually represents the TRL status of these projects at the outset and the number of projects falling into each respective TRL category. Funded projects that lacked a specific TRL or failed to provide TRL information were categorized as 'not specified'.

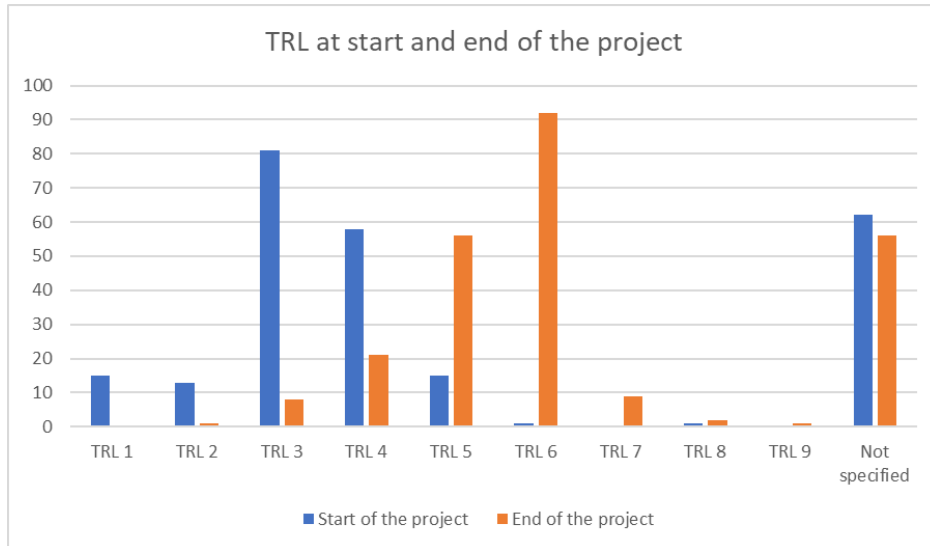


Figure 2: TRL at start and end of the project

The data paints a clear picture: there's a prevalence of projects starting at TRL 3 and 4, and ending at TRL 5 and 6. However, a notable gap becomes apparent when considering projects with a TRL of 6 or higher. The dataset reveals only one project which starts at TRL 6 and another at TRL 8, with no projects at TRL 7 or TRL 9. Accordingly, most projects end at TRL 5-6. A few projects occupy TRL 1 and 2. In essence, the analysis underscores that, while many projects begin at TRL 3 and 4, **there's a significant funding gap for projects starting at TRL 6 and beyond, as well as projects that end with a TRL of higher than 6.** This information can be further reinforced when considering the mapping of calls, indicating the need for greater support and investment in projects operating at these higher TRL stages. **Figure 1 presents a**

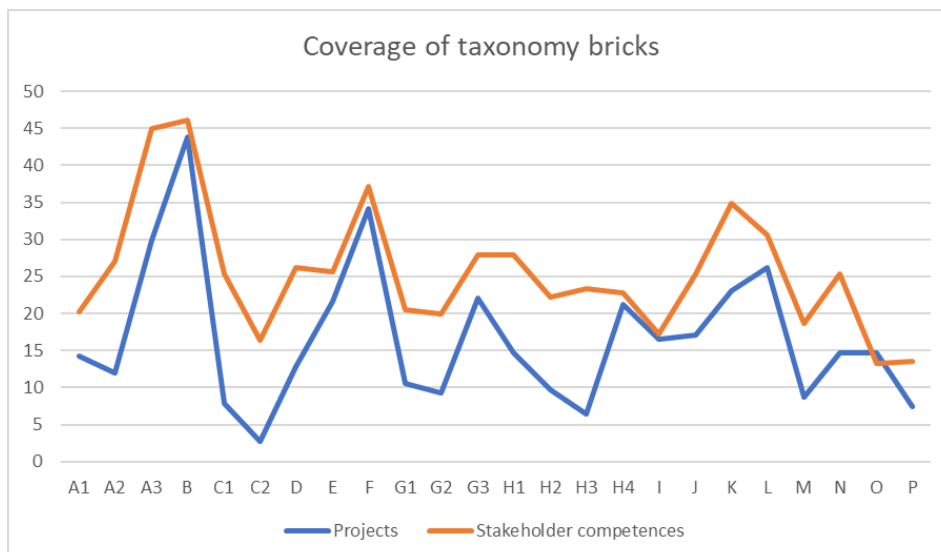


Figure 1: Correlation of taxonomy bricks coverage by project and stakeholder competences

correlation analysis between the mapping of projects and the mapping of stakeholder competences. This analysis centres on the comprehensive coverage of taxonomy bricks and encompasses a total of 246 projects and 348 stakeholder competences. One project can cover several taxonomy bricks, and one stakeholder can also have competences in several taxonomy bricks. To ensure comparability, the coverage is calculated and displayed in percent for each individual taxonomy brick. For example, 95 out of the 246 listed projects cover taxonomy brick B, which is roughly 39 percent of projects. For the stakeholder competences, 160 out of 348 stakeholders have competences in taxonomy brick B. Thus, 46% of stakeholder competences cover taxonomy brick B. The graph in Figure 1 reveals a noteworthy similarity in the extent to which both projects and stakeholder competences cover the taxonomy. This suggests a meaningful alignment between the expertise of stakeholders and the thematic areas of the projects. As the data for both stakeholder competences and projects was exclusively collected from the pilot regions, it underscores the preeminent competences within these pilot regions.

The analysis affirms that all taxonomy bricks receive some degree of coverage from both projects and stakeholder competences. However, it's crucial to recognize that specific taxonomy bricks exhibit low levels of coverage. Specifically, taxonomy bricks C1, C2, G1, G2, H2, H3, M, and P register less than 10 percent coverage by projects. Moreover, these taxonomy bricks garner a lower percentage of coverage by stakeholder competences compared to other areas of expertise. These findings suggest a positive correlation between these specific taxonomy bricks and stakeholder competences. The underrepresentation of particular taxonomy bricks could signal an inadequacy of available funding or support for projects associated with these technologies. This, in turn, would result in a dearth of expertise in these areas, further limiting the number of projects focused on these technology categories.

2.2.2. Mapping of calls

For the mapping of calls, a total of 291 calls were listed, including aeronautical and transversal calls. The analysis focused on using the calls TRL data to identify potential funding gaps. Figure 3 shows the TRL expected at the outset and end of these calls, as well as the number of calls in each TRL category.

There is a prevalence of expected TRL at the end of projects between TRL 4 and TRL 7. However, a notable gap emerges when considering calls with a TRL higher than 7. Also, only a few calls fund projects starting at TRL 1. In essence, the analysis shows that while many calls fund from TRL 2 to TRL 7, there is a significant

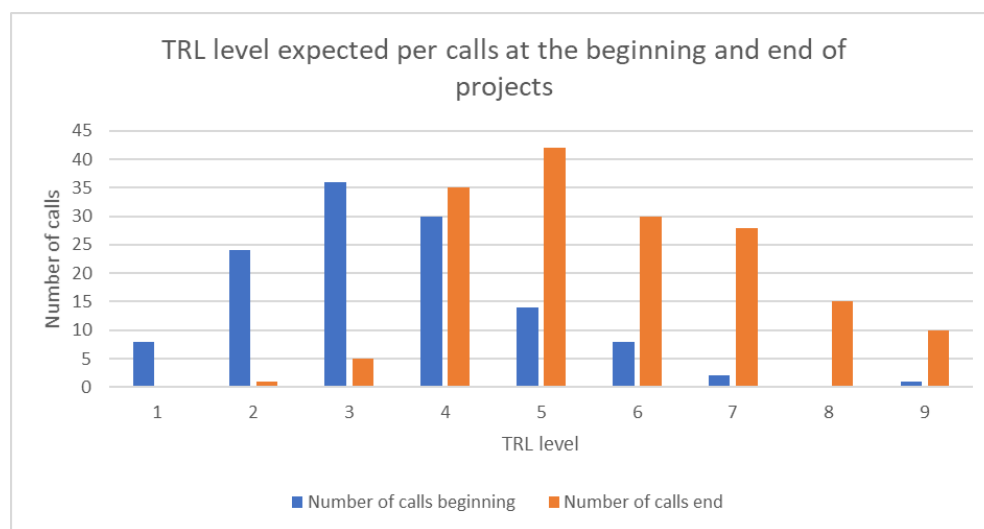


Figure 3: TRL expected at the beginning and end of calls

funding gap for calls beginning at TRL 1 and finishing at TRL 8 and 9. This information is reinforced by the mapping of projects, which shows that there are no aeronautical projects that reach a TRL higher than 7.

Figure 4 presents a correlation analysis between the mapping of calls and the mapping of stakeholder competences. This analysis focuses on the comprehensive coverage of taxonomy bricks and encompasses a total of 291 calls and 348 stakeholder competences. To ensure comparability, the coverage is calculated and displayed in percent, in the same methodology which was used for the analysis of the mapping of funded projects.

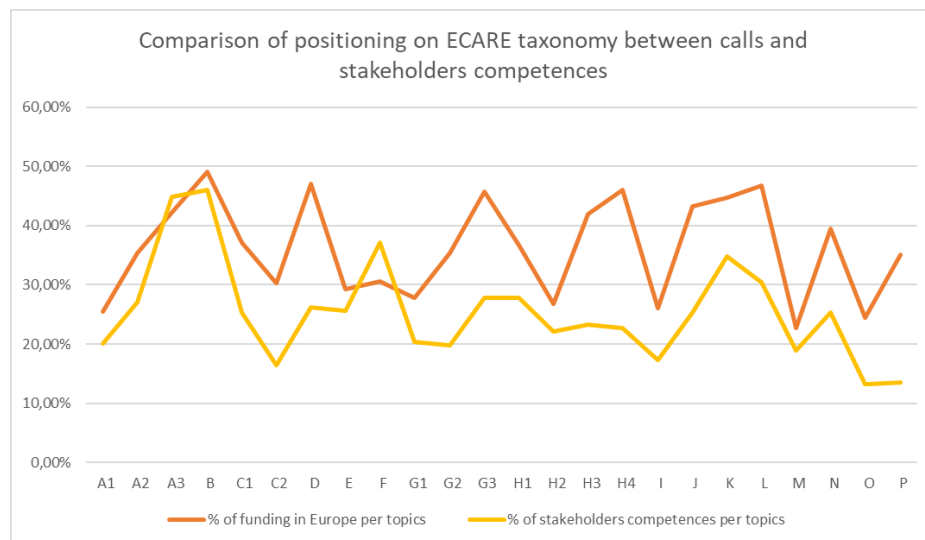


Figure 4: Correlation of taxonomy bricks coverage by calls and stakeholder competences

Figure 4 shows that there is a generally good alignment between the calls and the areas of expertise of stakeholders, with all taxonomy bricks receiving some degree of coverage. However, there are a few specific taxonomy bricks that could benefit from higher levels of coverage: A3, C2, D, G3, H3, H4, J, K and P. These taxonomy bricks also have a lower percentage of coverage by stakeholder competences compared to other areas of expertise, meaning that there is for a lack of funding or support for few stakeholder's associated with these taxonomy bricks.

2.2.3. Conclusion

The analysis of the calls, projects, and stakeholders' competences mapping confirmed what was already stated when examining the national and regional funding programs: there are no major gaps in terms of thematic coverage. On the opposite, there is significant overlaps between the various calls and funding bodies.

2.3. Interviews with aeronautical stakeholders

2.3.1. Methodology followed for the interviews

The deliverable D3.1, named 'List of needs', presents the needs of aeronautical stakeholders to learn about their experiences with funding, to identify funding gaps, and to explore potential synergies. **58 interviewees** with representatives of regional SMEs, intermediate-sized enterprises, large companies, RTOs and research universities have been conducted in May 2023. The interviews were semi-structured and followed a set of guidelines to ensure comparable results. The interviews were transcribed and analysed to identify the main needs of aeronautical stakeholders and potential synergy mechanisms.

2.3.1. Needs identified from the interviews

The ECARE consortium used the insights gained from the interviews to develop a first list of potential synergy mechanisms that can help to address the funding needs of aeronautical stakeholders and promote innovation in the sector. **The results are divided into funding and synergy needs** identified for the aforementioned stakeholders in the pilot regions in France, Italy and Germany. **Finally, five general funding needs and eight needs for synergies are identified and described.** In the following tables, each column expresses the needs identified by R&D&I actors during the interviews, and the bullet points represent the main points highlighted by the interviewees.

Table 1: Funding needs identified by R&D&I actors during the interviews

Funding needs from Interviews (D3.1)				
Need 1	Need 2	Need 3	Need 4	Need 5
Funding requirements	Industrialisation funding	Simplification of administrative process	Help with building consortia	Support for SME
<ul style="list-style-type: none"> Higher funding rates on national and regional level for all entities (Large company, intermediate sized enterprise, SME, RTO and research university) 	<ul style="list-style-type: none"> Public funding for projects with high TRL (like TRL 6-8) 	<ul style="list-style-type: none"> The simplification is expected for regional and national funding bodies by all type of stakeholders 	<ul style="list-style-type: none"> Help with consortium building particularly for entities for whom it is the first time 	<ul style="list-style-type: none"> Support for SME, not only expressed by the SME themselves, but also by other stakeholders who wish to collaborate with them (companies, RTOs and research universities)
<ul style="list-style-type: none"> Ease cofunding to achieve higher funding rates 	<ul style="list-style-type: none"> A funding bridge from research to industry 		<ul style="list-style-type: none"> Difficulty in finding international partners required for European projects, lack of the network and knowledge required to join and build consortia 	<ul style="list-style-type: none"> Participation to Clean Aviation funding program
<ul style="list-style-type: none"> More accurate funding budgets, better aligned with the cost of the stakeholders 	<ul style="list-style-type: none"> Funding for marketing and certification, difficult to find, especially when it comes to new innovative technologies 		<ul style="list-style-type: none"> Stronger involvement of clusters in the consortium building 	<ul style="list-style-type: none"> Funding support for SME in the preparation of proposals, with specific regard to high-risk projects.
<ul style="list-style-type: none"> Potential options to acquire more private funding in addition to public funding 	<ul style="list-style-type: none"> This need of funding high TRL touches all funding bodies and all stakeholders 			

Table 2: Synergy needs identified by R&D&I actors during the interviews (1/2)

Synergy needs from Interviews (D3.1)			
Need 6	Need 7	Need 8	Need 9
Communication and transparency mechanisms	Political alignment	Funding continuity	Funding of high TRL
<ul style="list-style-type: none"> • More communication between the funding bodies 	<ul style="list-style-type: none"> • Policy alignment across regions, national and European levels 	<ul style="list-style-type: none"> • Identification of synergy mechanisms to achieve more continuity in funding 	<ul style="list-style-type: none"> • Funding of TRL higher than 6
<ul style="list-style-type: none"> • Communication about upcoming calls, technological roadmaps and regulations before they are implemented and published at regional, national and European funding bodies. 	<ul style="list-style-type: none"> • Communication of tangible outcomes and concrete impact on funding due to policy alignment 	<ul style="list-style-type: none"> • Overstep the future difficulty of funding continuity implementation between funders 	<ul style="list-style-type: none"> • Developing synergies between funding bodies to share and organise the funding of high TRL projects
<ul style="list-style-type: none"> • Increased communication to the general public about the conclusions of funding body meetings. 	<ul style="list-style-type: none"> • Balance improvement among European, National and regional interests 		<ul style="list-style-type: none"> • New funding between research and finished products
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Cluster involvement to help funding bodies with political alignment 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Funding for the certification and marketing

Table 3: Synergy needs identified by R&D&I actors during the interviews (2/2)

Synergy needs from Interviews (D3.1)			
Need 10	Need 11	Need 12	Need 13
Harmonisation of application processes	Building consortia	Research infrastructure	Synergies with other industries
<ul style="list-style-type: none"> • Same eligibility criteria and proposal between different funding bodies at funding program level or at least for joint calls 	<ul style="list-style-type: none"> • Help aeronautical stakeholders with the building of consortia for all funding levels 	<ul style="list-style-type: none"> • Funding for the purchase and provision of already existing equipment 	<ul style="list-style-type: none"> • Simplification of data exchange between different projects of other industries
<ul style="list-style-type: none"> • Projects identified as important by a funding body must be referred for co-funding to another one, and, if the proposal cannot be accepted it must be referred to another funding program 	<ul style="list-style-type: none"> • Event presenting calls and entities open for participation 	<ul style="list-style-type: none"> • Creation of collaboration at European level for the use of existing infrastructure 	<ul style="list-style-type: none"> • Each proposal identifying other potential sectors that could be impacted
<ul style="list-style-type: none"> • Improve alignment of call issue dates with joint planning between different funding bodies 	<ul style="list-style-type: none"> • A platform presenting interested entities to calls from all over Europe 	<ul style="list-style-type: none"> • A platform presenting the infrastructure available at European level 	<ul style="list-style-type: none"> • Joint calls between funding bodies of different technological areas

2.3.2. Conclusion

The interviews revealed five general funding needs and eight needs for synergies. The findings of the interviews suggest that **there is a need for more funding opportunities for projects with a TRL of higher than 6**, as well as for **better coordination and harmonization of funding processes** across different funding bodies. Additionally, there is a need for **more support for SMEs in the aeronautics sector**. The ECARE consortium will use the insights gained from the interviews to identify the gaps and develop a set of recommendations for synergy mechanisms that can help to address the funding needs of aeronautical stakeholders and promote innovation in the sector.

2.4. Nationals Workshops with funding bodies

2.4.1. Methodology of the workshops

After the interviews phase, the next task was to hold three national workshops in parallel in the three pilot countries. The aim of the national workshops was to consult the national/regional funding authorities on their needs, experiences and potential best practices regarding synergies with Clean Aviation and beyond.

The workshops started by a presentation of D2.1 output (mappings of calls, funded projects and stakeholders' competences), as well as a presentation of interviews results, as produced in D3.1). Workshops participants could also share their views on these results and ask complementary questions.

The participants of the workshops were members of national/regional/European funding authorities and ESG members (clusters, EEN members, and agencies for aviation research).

The ECARE consortium had previously agreed on workshop methodology guidelines in order to ensure homogeneity between the three parallel national workshops and to optimise the global results collection. The ECARE project consortium adopted an interactive workshop structure, with a general presentation of the project, a presentation of the mappings results and interviews, and a discussion with participants. **The discussion was divided into three sessions based on the following challenges:**

- How to connect regional and national funding bodies to European funding bodies and vice versa?
- What has been identified as missing from public funding
- How regional and national funding bodies can help the regional supply chain actors to develop their knowledge on new technologies (fuel cell, hydrogen, hybrid, etc.) and participation in Clean Aviation?

The goal of the workshop was to openly articulate the experiences and opinions of the participants to identify the best ways to address these challenges. The workshops were thought to be in person, however, to facilitate the participation, hybrid modality was possible. Eventual last moment absences were resolved by successive individual calls to complete the action.

The methodology included a brainstorming by each participant at the start of the workshop. The participants thought and briefly presented their current challenges with funding. After, an interactive discussion was led with all stakeholders to promote interaction between them. A moderator responsible for each challenge completed the slides with all the participants information which permitted to review the workshop results and exchange with a final Q&A before closing the workshop.

Shortly after the workshop, each partner (HAV, AV & DAC) presented a synthetic summary of their NWS output in one-slide format which identifies the needs, gaps, barriers and synergies as presented in section 2.4.2.

2.4.2. Summary of national workshops per country

The main results of each national workshop are described in the next sections, separately for each country.

1.1.1.1 France

Aerospace Valley organised the French workshop on the 9th of June 2023 in hybrid mode. Four authorities and funding bodies participated:

- BPI France
- DGAC
- Region Occitanie
- Region Nouvelle-Aquitaine

The resulting chart with French feedback is shown in Figure 5.



Figure 5: Feedback chart from French NWS

1.1.1.2 Italy

Campania Aerospace District organised the Italian workshop on 14th of June 2023 in full online mode, with 10 participants:

- Italian Ministry of University and Research
- Campania Regional Ministry for Research, Innovation and Startups
- Federation of Chambers of Commerce of Regione Campania/EEN
- ENEA, Alternative Energy National Agency
- LAC, Lombardia Aerospace Cluster
- CEIP, Piemonte Agency Aerospace
- Lazio Innova/EEN
- DTA, Distretto Tecnologico Aerospaziale (Apulia)

- Umbria Aerospace Cluster

The resulting chart with Italian feedback is shown in Figure 6.

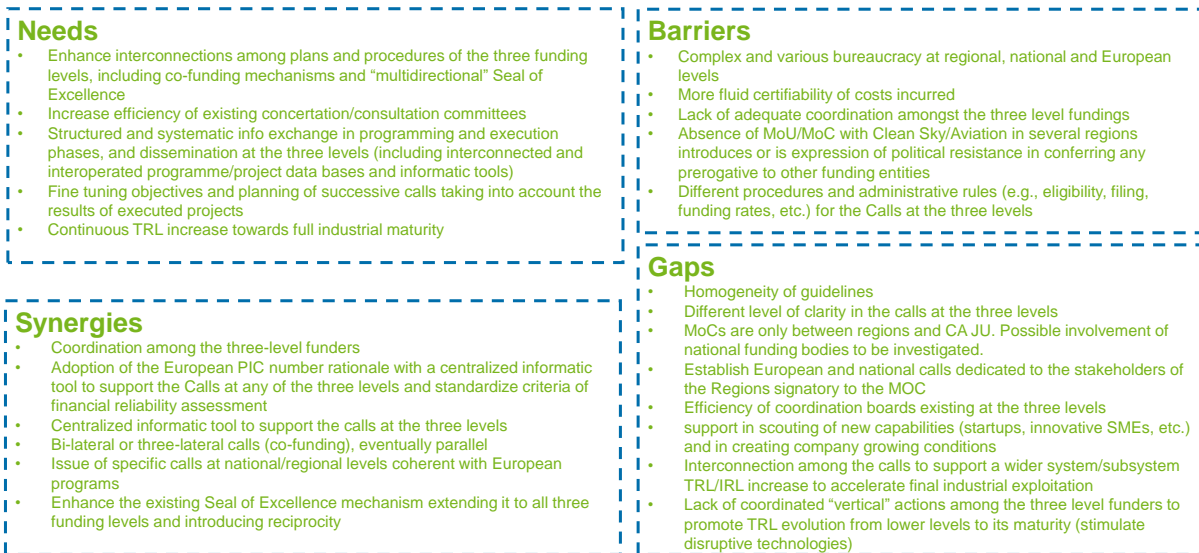


Figure 6: Feedback chart from Italian NWS

1.1.1.3 Germany

Hamburg Aviation organised the German workshop on 15th of June 2023. The meeting was fully physical with 5 participants:

- Hamburg Investment and Development Bank
- Ministry of Economy and Innovation Hamburg
- German Federal Ministry for Economic Affairs and Climate Action Department Aviation
- DLR Programme Management Agency for Aviation Research.

The resulting chart with German feedback is shown in Figure 7.

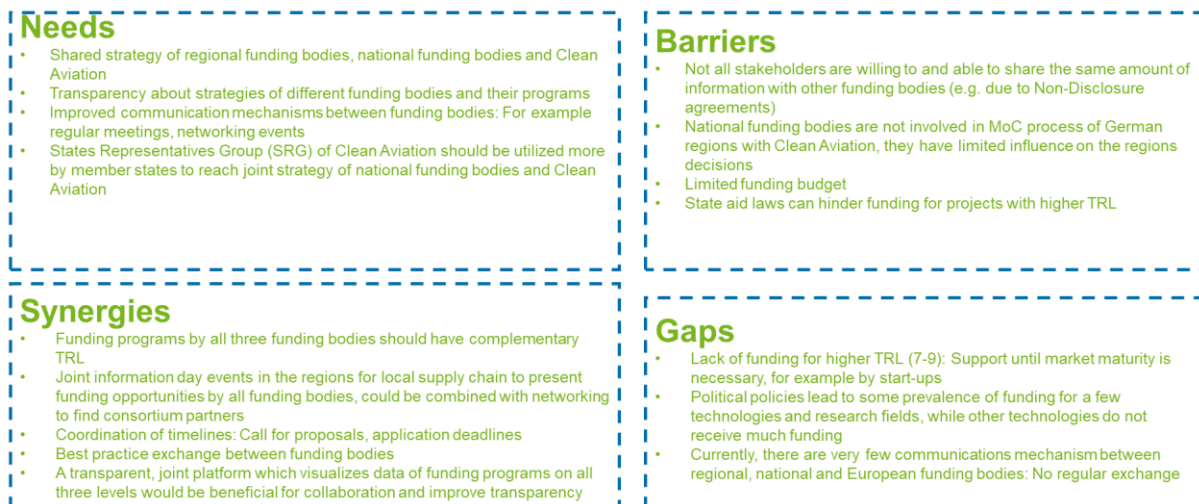


Figure 7: Feedback chart from German NWS

2.4.3. Needs identified during NWS

The results of the national workshops are a valuable contribution to the ECARE project and revealed 6 main needs from participants. They provide insights into the needs of stakeholders and identify opportunities for creating synergies with Clean Aviation. The workshops were attended by a variety of stakeholders, including funding bodies and industry representatives, as presented in the precedent section. Each column in Table 4 and

Table 5 represents a need identified during the national workshops, and the bullet points represent the main points highlighted by the participants.

Table 4: Needs identified by R&D&I actors during national workshops (1/2)

Funding bodies needs from national workshops		
Need 14	Need 15	Need 16
Policy	Alignment across regions/governmental levels	Communication and transparency mechanisms
<ul style="list-style-type: none"> To fund CAPEX for PRODUCTION additionally to RDI one 	<ul style="list-style-type: none"> Having funding rates as high as European one 	<ul style="list-style-type: none"> To present the regional/national project that are funded to Clean Aviation
<ul style="list-style-type: none"> CA developing proximity with companies all around Europe as regional and national does 	<ul style="list-style-type: none"> Regions integrated in the construction of roadmaps for Europe 	<ul style="list-style-type: none"> One newsletter only for funding bodies to find out what new funding is coming
<ul style="list-style-type: none"> Enhance interconnections among plans and procedures of the three funding levels, including co-funding mechanisms and “multidirectional” Seal of Excellence 	<ul style="list-style-type: none"> Shared strategy between regional and national funding bodies and Clean Aviation 	<ul style="list-style-type: none"> Better communication between funding bodies, for example with networking events
	<ul style="list-style-type: none"> Participation of clusters to the promotion of some projects to funding bodies 	<ul style="list-style-type: none"> Transparency about different funding programs and strategies
	<ul style="list-style-type: none"> States Representatives Group (SRG) of Clean Aviation should be utilized more by members to reach joint alignment/strategy of national funders and Clean Aviation 	<ul style="list-style-type: none"> Structured and systematic info exchange in programming and execution phases, and dissemination at the three levels (including interconnected and interoperated programme/project data bases and informatic tools).
		<ul style="list-style-type: none"> Increase efficiency of existing concertation/consultation committees

Table 5: Needs identified by R&D&I actors during national workshops (2/2)

Funding bodies needs from national workshops		
Need 17	Need 18	Need 19
Support for SME	Funding of high TRL	Continuity
<ul style="list-style-type: none"> Increase and facilitate the access of regional SMEs to European projects 	<ul style="list-style-type: none"> Need to have funding on higher TRL than 6 	<ul style="list-style-type: none"> Fine tuning objectives of technological roadmaps, funding programs and calls
<ul style="list-style-type: none"> Mandatory rate of 30 percent SME participation for each call 		<ul style="list-style-type: none"> Planning of successive calls at different levels
<ul style="list-style-type: none"> Incentive to have additional European funding if SMEs are involved 		<ul style="list-style-type: none"> Communication about the results of executed projects

2.4.4. Conclusion

The three national workshops permitted to gain several insights from national and regional funding authorities. Major findings are summarized here below for each country:

- **France:** The French participants highlighted the need for more funding opportunities for high-TRL projects, as well as for better coordination and harmonization of funding processes across different funding bodies. Additionally, there is a need for more support for SMEs and other non-traditional players in the aeronautics sector. They also identified the lack of communication and coordination between funding bodies as a major barrier to addressing these needs.
- **Italy:** The Italian participants emphasized the importance of cross-border collaboration and networking. They also called for more funding opportunities for early-stage TRL projects and for more support for SMEs. They identified the different funding eligibility criteria and application procedures as a major barrier to addressing these needs.
- **Germany:** The German participants stressed the need for a more transparent and efficient funding landscape. They also called for more funding opportunities for high-TRL projects and for more support for SMEs. They identified the complex and bureaucratic funding processes as a major barrier to addressing these needs.

Participation to NWS may appear low in terms of number of individual participants. Actually, attendance to NWS is considered quite satisfactory, as the main funding actors were involved. In addition, in case of last-minute absence, corrective actions were planned such as dedicated online exchanges and feedback request on specific questions via e-mail. The same approach will be followed in the future second-session of NWS.

2.5. Final list of needs identified following interviews and national workshops

Through interviews and national workshops, the ECARE consortium identified a total of **19 needs** for funding in the aerospace sector in Europe. **Some of these needs were similar**, so the consortium consolidated them into a **final list of 10 needs** as presented in Table 6 with their respective origins.

Table 6: Final list of needs with origins

	Final list of needs									
	Need 1	Need 2	Need 3	Need 4	Need 5	Need 6	Need 7	Need 8	Need 9	Need 10
	Funding requirements	Funding of high TRL	Continuity	Research infrastructure	Support for SME	Harmonisation of application processes	Building consortia	Communication and transparency mechanisms	Political alignment	Synergies with other industries
Origin	Interviews	Interviews and NWS	Interviews and NWS	Interviews	Interviews and NWS	Interviews	Interviews	Interviews and NWS	Interviews and NWS	Interviews

In the next Table 7 and Table 8, the consortium presents the 10 final needs selected and the bullet points regroups the main points highlighted from the interviews and national workshops participants.

Table 7: Final list of needs (1/2)

Final list of needs				
Need 1	Need 2	Need 3	Need 4	Need 5
Funding requirements	Funding of high TRL	Continuity	Research infrastructure	Support for SME
<ul style="list-style-type: none"> Higher funding rates on national and regional level for all entities (Large company, intermediate sized enterprise, SME, RTO and research university) 	<ul style="list-style-type: none"> Public funding for projects with TRL higher than 6, this need touches all funding bodies and stakeholders 	<ul style="list-style-type: none"> Identification of synergy mechanisms to achieve more continuity in funding 	<ul style="list-style-type: none"> Funding for the purchase and provision of already existing equipment 	<ul style="list-style-type: none"> Support for SME, not only expressed by the SME themselves, but also by other stakeholders who wish to collaborate with them (large companies, RTO)
<ul style="list-style-type: none"> Ease cofunding to achieve higher funding rates 	<ul style="list-style-type: none"> Funding for marketing and certification 	<ul style="list-style-type: none"> Overstep the future difficulty of funding continuity implementation between funders 	<ul style="list-style-type: none"> Creation of collaboration at European level for the use of existing infrastructure 	<ul style="list-style-type: none"> Increase and facilitate the access of regional SMEs to European projects (Clean Aviation funding program & Horizon Europe)
<ul style="list-style-type: none"> More accurate funding budgets, better aligned with the cost of the stakeholders 	<ul style="list-style-type: none"> Aeronautical IPCEI and Innovation Fund for industrialisation 	<ul style="list-style-type: none"> Clusters involvement for the promotion of projects to funding bodies 	<ul style="list-style-type: none"> A platform presenting the infrastructure available at European level 	<ul style="list-style-type: none"> Funding support for SME in the preparation of proposals, regarding high-risk projects.
<ul style="list-style-type: none"> Potential options to acquire more private funding in addition to public funding 	<ul style="list-style-type: none"> Funding for CAPEX PRODUCTION additionally to RDI one 	<ul style="list-style-type: none"> Increase efficiency of existing concertation/consultation committees 		<ul style="list-style-type: none"> Mandatory rate of 30 percent SME participation for each call
				<ul style="list-style-type: none"> Incentive to have additional European funding if SMEs are involved

Table 8: Final list of needs (2/2)

Final list of needs				
Need 6	Need 7	Need 8	Need 9	Need 10
Harmonisation of application processes	Building consortia	Communication and transparency mechanisms	Political alignment	Synergies with other industries
<ul style="list-style-type: none"> Same eligibility criteria and proposal between different funding bodies at funding program level or at least for joint calls 	<ul style="list-style-type: none"> Help aeronautical stakeholders with the building of consortia at all funding levels, especially when it is their first time 	<ul style="list-style-type: none"> Better communication and transparency between the funding bodies about: funded projects, budget, funding programs, strategies. 	<ul style="list-style-type: none"> Regions integrated in the construction of roadmaps for Europe 	<ul style="list-style-type: none"> Simplification of data exchange between different projects of other industries
<ul style="list-style-type: none"> Projects identified as important by a funding body must be referred for co-funding to another one, and, if the project cannot be accepted it must be referred to another funding body. 	<ul style="list-style-type: none"> Difficulty in finding international partners required for European projects, lack of the network and knowledge required to join and build consortia 	<ul style="list-style-type: none"> Increased communication to the general public about the conclusions of funding body meetings. 	<ul style="list-style-type: none"> Shared strategy between regional and national funding bodies and Clean Aviation to promote co-funding mechanisms. 	<ul style="list-style-type: none"> Each proposal identifying other potential sectors that could be impacted
<ul style="list-style-type: none"> Improve alignment of call dates with joint planning to align the timing of all funding levels calls 	<ul style="list-style-type: none"> Stronger involvement of clusters in the consortium building 	<ul style="list-style-type: none"> To present the regional/national projects that are funded to Clean Aviation 	<ul style="list-style-type: none"> SRG meeting of CA should be used to reach joint alignment/strategy with national funders 	<ul style="list-style-type: none"> Joint calls between funding bodies of different technological areas
<ul style="list-style-type: none"> European PIC to submit projects 	<ul style="list-style-type: none"> Event presenting calls and entities open for participation at European level 	<ul style="list-style-type: none"> One newsletter only for funding bodies to find out what new calls are coming 	<ul style="list-style-type: none"> CA developing proximity with companies all around Europe as regional and national does 	
	<ul style="list-style-type: none"> A platform presenting interested entities to calls from all over Europe 	<ul style="list-style-type: none"> Communication of tangible outcomes and concrete impact on funding due to policy alignment 	<ul style="list-style-type: none"> “Multidirectional” Seal of Excellence 	

3. Gap Analysis

3.1. Introduction

In the frame of the ECARE project, a gap can be defined as a lack of funding during the various stages of research, innovation, product development, and related early-stage marketing. A funding gap is the amount of money needed to fund future development of a business or a project that is not currently funded with public or private funding (grant, equity, debt) which may be particularly critical for small companies. A gap in funding can also be defined as a missing actions or cooperation from funding authorities.

The role of regional, national and European governing bodies is paramount in funding gaps closing, eventually in association with investment from private funding.

The present chapter aims to assess the major gaps and bottlenecks among public funding support and the needs felt by the aerospace sector in Europe. The analysis is performed for the four pilot regions covered by the ECARE project, namely: Occitanie and Nouvelle Aquitaine in France, Hamburg in Germany and Campania in Italy. To identify the gaps, the primary source of information is from the results of the national workshops (NWS) organized in the related three pilot countries as well as the results of interviews with stakeholders in the aerospace sector. See section 2.3 for the final list of needs.

3.2. Methodology

The methodology followed to identify and analyse funding gaps, as schematically represented in Figure 8, mainly considers the needs identified by funding bodies during the NWS, combined with those identified in the interviews with R&D&I actors (companies, RTOs and research universities) and reported in the deliverable D3.1. The analysis is carried out considering also the potential gaps both the R&D&I actors and funding bodies expressed during the interactions. At the same time, stakeholders' competences, funded projects and funding opportunities over the last 5 years are considered. The analysis is then complemented by data and considerations coming out from the expertise and background of the partner clusters involved in the study.

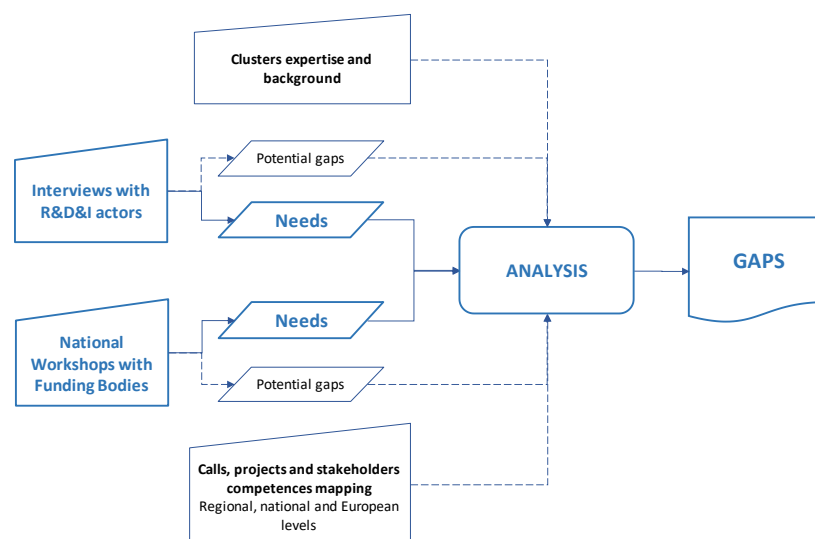


Figure 8: Gaps analysis methodology chart

The exchange of knowledge with a view to identify funding gaps and needs is useful to be later addressed through possible synergies at regional, national and European level.

3.3. Gaps presentation

Table 9 summarizes the gaps in funding identified by the ECARE project. **The process illustrated in the previous paragraph allowed the identification of 17 gaps, listed together with their respective origins.**

Table 9: Description of identified gaps

#	Description	Origin
Gap 1	Lack of support by all level of funding bodies after the end of projects	D3.1 & NWS
Gap 2	Lack of coordinated “vertical” actions among the three level funders to promote TRL evolution (successive funded contracts on a same project targeting different TRLs)	D3.1 & NWS
Gap 3	Interconnection among the calls to support a wider system/subsystem TRL increase to accelerate final industrial exploitation	D3.1 & NWS
Gap 4	Lack of homogeneity in the guidelines among regional, national and European calls	D3.1 & NWS
Gap 5	Different level of clarity among regional, national and European calls about content, modalities, eligibility, funding rate, etc.	D3.1 & NWS
Gap 6	Lack of support for projects with TRL higher than six, until full commercial application.	D3.1 & NWS
Gap 7	No joint calls by European and national/regional funding authorities	Cluster
Gap 8	Gaps in some fields of research due to policies and/or political interests	D3.1 & NWS
Gap 9	MoC signed between CAJU and regions, without involving national authorities	D3.1 & NWS
Gap 10	No calls specifically dedicated to entities in MoC regions	D3.1 & NWS
Gap 11	Poor efficiency among coordination boards existing between the three levels	D3.1 & NWS
Gap 12	Not enough coordination-between the different funding bodies	Cluster
Gap 13	Lack of funding for aeronautic projects in fundamental research	Cluster
Gap 14	SME have difficulties to access funding at European level	Cluster
Gap 15	Lack of SME participation to Clean Aviation projects	D3.1 & NWS
Gap 16	Lack of Clean Aviation support to fundamental research	Cluster
Gap 17	Lack of SME support to develop knowledge and skills in new technologies within the Clean Aviation framework.	D3.1 & NWS

3.3.1. Explanation of the identified gaps

Each of the 17 gaps are detailed in Table 10 for a deeper and clear understanding.

Table 10: Gaps explanation

#	Gap explanation
Gap 1	Several stakeholders (especially SMEs) suffer of lack of continuity. At the end of a funded project, it is simply stopped with the risk that everything done and every result achieved become soon obsolete or abandoned. So, there is no action, specific funding schemes or at least attention to support these activities and results remain alive. And this is true at all regional, national and European level.

Gap 2	The basic requirement or wish is to continue the development of a project up to its highest TRL. This would require a specific coordination among the different funding actions (calls) in a way to provide the continuous opportunity to propose the same project but targeting a next higher TRL level. What is missing is a mechanism to give priority to those proposals related to the project for which a previous TRL has been funded, either by the same funding body or by one of the other two levels.
Gap 3	Similar to Gap 2, there is a request to give priority and support to various proposals related to the same project but dealing with different project aspects or subsystems. This would enhance the development of knowledge and products in a more coherent manner concerning the TRL of different components of the systems.
Gap 4	The stakeholders suffer of the extended diversity of rules and modalities to participate and submit proposals to the various calls at the three levels. It happens frequently that the guidelines of the calls change from one year to another, from one call to another, within the same funding body and among the three-level systems.
Gap 5	As for gap 4, there are often different modalities, eligibility criteria as well as funding rates among the three funding levels and also from one call to another. Often the clarity in the instructions are different from one funding body to another.
Gap 6	Several companies ask for more support for proposal at TRL higher than 6, otherwise they are unable to bring the idea to the market. The limitations imposed by the fundamental rule of funding non-competitive activities is well known and appreciated; however, several of these stakeholders feel more adequate to find IPR solutions to the competitiveness rather than risking to stop the development of a good project because of lack of fund.
Gap 7	The different funding opportunities are perceived as entirely separate, indicating a lack of coordination and/or collaboration between European funding authorities and their national or regional counterparts when designing calls.
Gap 8	While European Commission (EC) policies dictate that there should be a level of cohesion between nations and regions, the presence of varying interests at these three levels often leads to differing definitions of priorities. Consequently, disparities arise among the decision-making bodies at these levels. For instance, a nation or region focused on supporting the development of general aviation or military transportation aircraft may not be inclined to issue calls related to commercial single or double-aisle aircraft, and vice versa.
Gap 9	The availability of MoC between CA and regions does not facilitate the proactive relations with the national level bodies and may even represent a constraint especially thinking at an eventual three-level approach.
Gap 10	Stakeholders of a region having an MoC with CA JU may wish to see a more direct return of it in approaching CA calls. The current situation is occasionally viewed as an imbalanced arrangement in which the European level primarily encourages regions to issue calls on topics of interest to CA, with limited reciprocation to the regions.
Gap 11	Despite the existence of several boards and committees with the objective of fostering coordination among the three-level funding mechanisms, their effectiveness and efficiency do not seem to resonate significantly with stakeholders. Apart from occasional, albeit somewhat sporadic and inconsistent information coordination, there is limited evidence of their overall efficiency. Stakeholders often find themselves engaging with national contact points and other interfaces, without perceiving the expected action.
Gap 12	This gap is the head of all and synthetize the feeling that more coordination should be implemented for a better and more effective coordinated action including all three-level systems.

Gap 13	Several SMEs, RTOs and research universities suffer of available funding opportunities to investigate new ideas at very low TRL. In certain countries, the calls span across various scientific and technical domains, leading to a situation where the aeronautics sector must vie for resources alongside other industries such as healthcare and automotive.
Gap 14	The complex and highly competitive nature of the European research framework program often places SMEs at a disadvantage. Many SMEs lack the necessary resources to effectively identify and prepare their proposals. Consequently, they frequently submit projects that are incongruous with the call's requirements or insufficiently developed. This, in turn, hinders their ability to access European funds, as the mismatch between their proposals and the funding criteria presents a significant barrier to their participation and success in securing European-level funding.
Gap 15	Due to the primary focus of CA JU on large aircraft products, the calls and the associated projects are of such significance that SMEs, especially the smallest ones, struggle to establish partnerships and, consequently, face challenges in participating in these projects.
Gap 16	There are several stakeholders that are more interested in low TRL development in aeronautics, but CA JU is oriented to support applied research.
Gap 17	SMEs suffer for not having specific attention and funds for developing knowledge and skills in the newest technologies. Even though SMEs are more dynamic than the large companies, their dimension does not allow them to dedicate enough resources to develop new competences on new topics.

3.4.Gaps prioritised with the final needs

The cross-correlation of each gap with the final needs allows to highlight the correlation between them, indicated in dark blue. The cross-correlation of gaps and needs provides a view of their priority, with high priority topics highlighted in green, secondary priority topics highlighted in orange, and low priority topics highlighted in red. **Each need fulfilling a gap represent one point, the prioritisation is made with the gaps being answered by the most needs. These elements are presented in Table 11.**

Table 11: Gaps cross-correlated and prioritised with needs

Gaps identified	Final list needs										Priorisation
	Need 1	Need 2	Need 3	Need 4	Need 5	Need 6	Need 7	Need 8	Need 9	Need 10	
	Funding requirements	Funding of high TRL	Continuity	Research infrastructure	Support for SME	Harmonisation of application processes	Building consortia	Communication and transparency mechanisms	Political alignment	Synergies with other industries	Total
Gap 1											2
Gap 2											2
Gap 3											2
Gap 4											2
Gap 5											2
Gap 6											1
Gap 7											3
Gap 8											3
Gap 9											2
Gap 10											2
Gap 11											1
Gap 12											4
Gap 13											4
Gap 14											2
Gap 15											4
Gap 16											3
Gap 17											2
Priorisation	4	4	1	1	5	5	4	3	10	4	

The table shows a strong correlation between many of the gaps and the final list of needs. This suggests that the European aeronautic sector needs a more efficient and coherent funding system that provides continuous funding for R&D projects, simplifies administrative processes, and makes it easier for SMEs to access funding.

4. Synergy mechanisms identification

4.1. Introduction

Synergies in public funding **occurs when the joining of at least two actions from different funding bodies improves public support effectiveness to a greater level compared to when the funding bodies were operating separately.** Implementation of synergies among the different funding bodies operating at regional, national and European level translates in a better implementation of overall short and long-term strategies.

A better implementation of the European strategy, which maximises coherence with regional RIS3 and national strategies and priorities, would translate into more effective action in supporting the development of the aerospace sector in terms of: (i) better products; (ii) more competitiveness of the European actors; (iii) greener developments; (iv) greater sustainability of the sector.

4.2. Methodology

As schematically represented in Figure 9, potential synergy mechanisms were identified to address the gaps reported in the previous section. The methodology began and was primarily based on the previous gaps analysis, but also considered the funding bodies' perspectives on potential synergies, as expressed during the workshops, combined with those identified in the interviews with R&D&I actors (companies, RTOs and research universities) and highlighted in section 2 with the final list of needs. Additionally, stakeholders' competences, funded projects, and calls over the last five years were considered as boundary conditions. The analysis is then complemented by data and considerations coming out from the expertise and background of the partner clusters involved in the study.

The objective is to draw up a list of potential complementarity/synergy mechanisms that can be used as a basis for discussions and elaborations during the future transnational workshop.

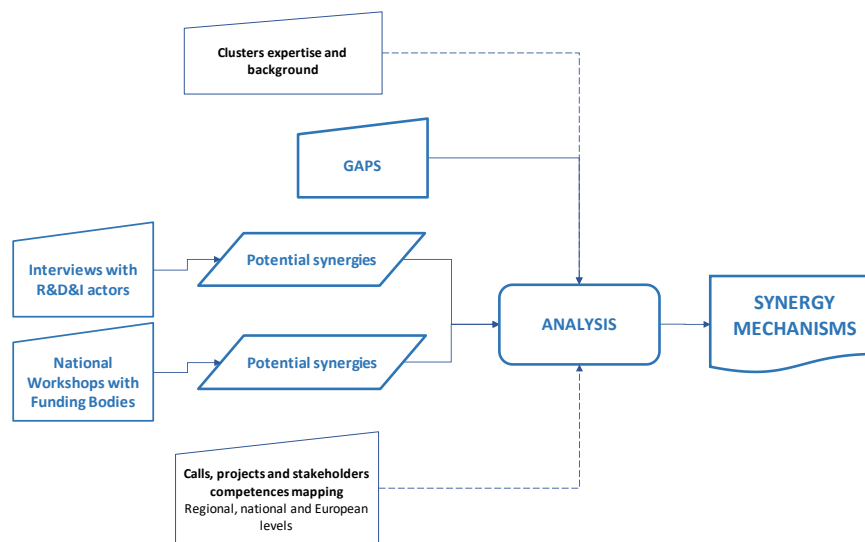


Figure 9: Synergy analysis methodology chart

4.3. Synergy Mechanisms Identification

The Table 12 summarizes the synergies mechanisms identified in the ECARE project. These synergies mechanisms aim to improve the efficiency and coherence of public funding for the green transition of the European aerospace sector. The process illustrated allowed the identification of 18 synergy mechanisms, listed in the following Table 12. Each of them is indicated together with its respective origin, either national workshops, D3.1 or clusters. For this latest one, clusters from the ECARE consortium have identified some mechanisms that could be assimilated to synergies and could be inspiring for ECARE synergies.

These 18 synergies mechanisms were regrouped in 4 main categories:

- **Strategic alignment** in public funding is the process of ensuring that the roadmaps, strategies, goals, and objectives of public funding programs are aligned across different funding bodies and with the government's strategic objectives and priorities.

- **Communication and transparency** in public funding is the process of sharing information about public funding programs, funded projects and initiatives with the stakeholders and the public in a clear and accessible way.
- **Harmonization of processes** in public funding is the process of making the procedures and requirements for applying for and receiving public funding more consistent across different funding bodies.
- **New calls** in public funding are new funding or co-funding opportunities that are created specifically to support the development and deployment of new technologies and innovations.

Table 12: Identified synergy mechanisms

#	Grouping	Description	Origin
Synergy 1	Strategical alignment	Discussion, presentation and alignment of strategic roadmaps by all funding bodies	D3.1 & NWS
Synergy 2	Strategical alignment	Funding programs construction at regional / national / European levels with complementary TRL coverage	D3.1 & NWS
Synergy 3	Strategical alignment	Standardized criteria of financial reliability assessment	D3.1 & NWS
Synergy 4	Communication and transparency	Regular meetings among regional, national and European funding bodies	D3.1 & NWS
Synergy 5	Communication and transparency	Common communication between different funding bodies	Cluster
Synergy 6	Communication and transparency	Communication between funded projects consortia of different funders	D3.1 & NWS
Synergy 7	Communication and transparency	Joint info days with different funding bodies	D3.1 & NWS
Synergy 8	Harmonisation of processes	Centralized tool which visualizes data of calls, funded projects and stakeholders competences at regional, national and European levels	D3.1 & NWS
Synergy 9	Harmonisation of processes	European PIC	D3.1 & NWS
Synergy 10	Harmonisation of processes	Seal of Excellence mechanism	D3.1 & NWS
Synergy 11	Harmonisation of processes	SME Fast track and Plug-In for CA inspired by European Innovation	Cluster
Synergy 12	New calls	Specific calls at regional/national levels coherent with Clean Aviation technologies	D3.1 & NWS
Synergy 13	New calls	Regional cluster issue call of interest to promote projects linked to CA technologies	D3.1 & NWS
Synergy 14	New calls	Simultaneous calls for Interest in different countries with Eurostars calls for projects with CA key technologies	Cluster
Synergy 15	New calls	Through a unique call, different funding bodies fund separate TRLs bricks hold in a global project	Cluster
Synergy 16	New calls	Clean Aviation Cascade funding	D3.1 & NWS
Synergy 17	New calls	Aeronautical IPCEI	Cluster
Synergy 18	New calls	Co-funding with bi-lateral or three-lateral calls	Cluster

The synergies identified in this table are an important starting point for improving the efficiency and coherence of public funding for the green transition of the European aerospace sector. They could contribute to supporting the development of more environmentally friendly technologies and products, and strengthening the competitiveness of the European industry.

4.3.1 Synergy mechanism prioritised with gaps

Table 13 shows the cross-correlation between each synergy mechanism and the gaps that it can potentially fully or partly address, indicated in dark blue. The cross-correlation of each gap with the final needs allows to highlight the correlation between them, indicated in dark blue. The cross-correlation of synergies and gaps provides a view of their priority, with high priority topics highlighted in green, secondary priority topics highlighted in orange, and low priority topics highlighted in red. Each gap fulfilling a synergy represent one point, the prioritisation is made with the synergies being answered by the most gaps. This table highlights that all of the gaps can potentially be filled in with the identified synergies.

Table 13: Synergy mechanisms cross-correlated and prioritised with gaps

#	Gap 1	Gap 2	Gap 3	Gap 4	Gap 5	Gap 6	Gap 7	Gap 8	Gap 9	Gap 10	Gap 11	Gap 12	Gap 13	Gap 14	Gap 15	Gap 16	Gap 17	Gap 18	Total
Synergy 1																			12
Synergy 2																			4
Synergy 3																			4
Synergy 4																			13
Synergy 6																			6
Synergy 7																			6
Synergy 8																			9
Synergy 8																			7
Synergy 9																			2
Synergy 10																			6
Synergy 11																			8
Synergy 12																			6
Synergy 13																			12
Synergy 14																			4
Synergy 15																			6
Synergy 16																			7
Synergy 17																			8
Synergy 18																			4
Total	11	17	6	5	5	7	8	6	5	5	12	3	7	4	6	6	3	8	

4.3.2 Synergy mechanisms presentation

This section presents and explains the main characteristics of each identified synergy mechanism, which are grouped into four categories in the following sections.

4.3.2.1 Strategic alignment

<ul style="list-style-type: none"> • Synergy #: 1 • Title: Discussion, presentation and alignment of strategic roadmaps by all funding bodies • Description: <p>Discussing and presenting roadmaps by all funding bodies can help to: (1) Exchange knowledge about mid-term strategic vision and improve global coordination; (2) Identify and address gaps in funding; (3) Ensure that funding is aligned with the needs of the industry and the research community; (4) Promote collaboration between funding bodies and other stakeholders; (5) Increase transparency and accountability; (6) Coordinate timelines and topics.</p> <p>The discussion and presentation of a roadmap could be done in a variety of ways. One approach would be to hold a workshop for each country and/or region signatory of MoC with Clean Aviation.</p> • Level of funding: Regional funding bodies, national funding bodies and CAJU

<ul style="list-style-type: none"> • Synergy #: 2 • Title: Funding programs construction at regional / national / European levels with complementary TRL coverage • Description: <p>This synergy aims to ensure that the different public funding programs are complementary and coherent in terms of TRL coverage support. It can only be achieved when all funding bodies communicate and are transparent during the technical roadmap construction, the preparation and the launch of calls.</p> <p>It could be translated into the establishment of a coordination and consultation mechanism between the different funding bodies. And, they would need to exchange on a regular basis during the roadmap construction.</p> • Level of funding: Regional funding bodies, national funding bodies and CAJU
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<ul style="list-style-type: none"> • Synergy #: 3 • Title: Standardized criteria of financial reliability assessment • Description: The standardized criteria of financial reliability assessment between funding bodies would a set of measures used to assess an organization's ability to repay its debts and meet its financial obligations. They could help to improve decision-making, increase accountability, enhance transparency in the public funding process and identify organizations that are most likely to be successful in using public funds. • Level of funding: Regional funding bodies, national funding bodies and CAJU
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4.3.2.2 Communication and transparency

<ul style="list-style-type: none"> • Synergy #: 4 • Title: Regular meetings among regional, national and European funding bodies • Description: This synergy aims to promote dialogue and consultation between different public funding bodies. It could be translated into the establishment of regular meetings between representatives of different public funding bodies, for example to present funded projects and to be funded and best practice exchange. This meeting could be held on a monthly basis with one representative per signatory MoC regions, one representative of the national funding body and one representative of CAJU. • Level of funding: Regional funding bodies, national funding bodies and CAJU

<ul style="list-style-type: none"> • Synergy #: 5 • Title: Common communication between different public funding bodies • Description: More communication between different funding bodies, especially when both fund similar technologies and research. Example: Clean Aviation exchanges with national funding bodies to promote national calls linked to CA key technologies. This synergy aims to improve coordination and cooperation between different public funders. It could be translated into the establishment of regular communication mechanisms, such as monthly meetings, events, and publications on the online ECARE platform. • Level of funding: Regional funding bodies, national funding bodies and CAJU
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- **Synergy #:** **6**
- **Title:** **Communication between funded projects consortia of different funders**
- **Description:**
 To promote communication between consortia of different funders, different tools can be used:
 - **Networking events for consortia.** These events could provide a platform for consortia to meet, share information, and discuss collaboration opportunities.
 - **A consortium mentorship program.** This program could match experienced consortia with newer consortia to share knowledge and advice.
 - **Organize events and discussion forums specific to collaboration of consortia.**
 Promoting communication between consortia of different funders can help to create a more collaborative and efficient environment for the development of sustainable aviation technologies.
- **Level of funding:** Regional funding bodies, national funding bodies and CAJU

- **Synergy #:** **7**
- **Title:** **Joint info days with different funding bodies**
- **Description:**
 Joint info days by different funding bodies to jointly promote calls to local stakeholders in the supply chain and help with consortia building. These info days could be organized and take place directly in the (MoC) region with funding bodies at all levels.
- **Level of funding:** Regional funding bodies, national funding bodies and CAJU

4.3.2.3 Harmonisation of processes

- **Synergy #:** **8**
- **Title:** **Centralized tool which visualizes data of calls, funded projects and stakeholders' competences at regional, national and European levels**
- **Description:**
 This synergy aims to improve the transparency and comparability of data on public funding for the green transition of the aerospace sector by setting up a unified platform that visualizes data of calls, funded projects and stakeholders' competences at the regional, national, and European levels. Such

a tool would be a valuable for promoting collaboration and efficiency in the European research and innovation landscape.

The ECARE digital platform is under development and will bring together information on calls for proposals, funding programs, funded projects and stakeholders' competences. Once all funding bodies integrate their information on the ECARE digital platform, this synergy will be achieved.

Such a tool would provide a number of benefits: (1) Improved communication and collaboration between funding bodies; (2) Increased transparency and accountability; (3) Raise awareness of public funding opportunities; (4) Support evidence-based decision making

- **Level of funding:** Regional funding bodies, national funding bodies and CAJU

- **Synergy #:** 9

- **Title:** European PIC

- **Description:**

A European PIC, (Participant Identification Code), would be a unique identifier assigned to an organization that wishes to apply for public funding within the European Union. This number would be used to identify the organization in all public funding procedures, which would help to simplify and streamline the application and award processes.

The potential benefits of a European PIC are: (1) Reduced administrative burden; (2) Improved transparency; (3) Increased efficiency; (4) Promoted cross-border cooperation.

- **Level of funding:** Regional funding bodies, national funding bodies and CAJU

- **Synergy #:** 10

- **Title:** Seal of Excellence mechanism

- **Description:**

The objective of this synergy is to:

- **Extend the Seal of Excellence mechanism to national and regional levels.** This would make it easier for entities to access funding from a wider range of sources.
- **Introduce balanced reciprocity to reduce administrative burden for entities,** funding bodies would be able to recognize the Seal of Excellence mechanism awarded by other funding bodies.
- **Introduce balanced reciprocity to increase collaboration,** funding bodies would be able to collaborate more effectively. This would help to ensure that funding is being used efficiently and that the best projects are being funded.

- **Level of funding:** Regional funding bodies, national funding bodies and CAJU

• Synergy #:	11
• Title:	SME Fast track and Plug-In for CA inspired by European Innovation Council
• Description:	<p>The Fast Track and Plug-In schemes for Clean Aviation, inspired by the European Innovation Council (EIC), are designed to accelerate the development and deployment of clean aviation technologies.</p> <p>The Fast Track scheme could allow SME projects that have been selected for funding under Clean Sky 2 to submit shorter proposals and be proposed as potential partners for future Clean Aviation projects. This can save time and promote the participation of SMEs to Clean Aviation projects.</p> <p>The Plug-In scheme could allow SME projects that have been selected for funding under national or regional programs on CA technologies to submit proposals to Clean Aviation, without having to go through the full evaluation process. This can help to bridge the gap between the lack of participation of SMEs with national and regional research funding and European research funding.</p>
• Level of funding:	Regional funding bodies, national funding bodies and CAJU

4.3.2.4 New calls

• Synergy #:	12
• Title:	Specific calls at regional/national levels coherent with Clean Aviation technologies
• Description:	<p>Once communication and transparency are in place, regional and national funding bodies can fully align their calls with Clean Aviation. The goal is for proposed calls to be complementary to those proposed by Clean Aviation, with regional and national programs targeting lower or higher TRL levels, or topics that are not covered. This synergy is directly linked to Synergy 1.</p>
• Level of funding:	Regional funding bodies <u>and/or</u> national funding bodies

• Synergy #:	13
• Title:	Regional cluster issue call of interest to promote projects linked to CA technologies
• Description:	<p>Based on its technical knowledge, the cluster could issue call for interest to promote projects on Clean Aviation technologies. Once the call for interest is launched and applications are received, the cluster</p>

could present the different selected projects to all funding bodies to find the best match for the funding.

- **Level of funding:** Regional funding bodies and CAJU
- **Type of beneficiary:** SMEs
- **TRL beginning and end:** 4-6
- **Type of project:** Mono-beneficiary or collaborative
- **Technical topic:** CA key technologies

- **Synergy #:** **14**
- **Title:** **Simultaneous calls for Interest in different countries with Eurostars²³ calls for projects with CA key technologies**

- **Description:**

The proposal is to issue simultaneous calls for interest in different countries with Eurostars to promote projects on CA key technologies. This would allow researchers and businesses from different countries to collaborate on projects that develop and deploy CA key technologies.

- **Level of funding:** Regional funding bodies and national funding bodies
- **Type of beneficiary:** SME
- **TRL beginning and end:** 1-9
- **Type of project:** Mono-beneficiary or collaborative
- **Technical thematic:** All

- **Synergy #:** **15**
- **Title:** **Through a unique call, different funding bodies fund separate TRLs bricks hold in a global project**

- **Description:**

This synergy aims to ensure continuous funding for aerospace transition projects, from basic research to commercialization, by proposing calls for the same topic for funding different TRL in the project

²³ Eurostars is the largest international funding programme for SMEs wishing to collaborate on R&D projects that create innovative products.

across different funding bodies. For this synergy it is necessary that funding bodies agree on the topic of the call and decide which funding body will fund which TRL.

- **Level of funding:** Regional funding bodies, national funding bodies and CAJU
- **Type of beneficiary:** All
- **TRL beginning and end:** 1-9
- **Type of project:** Mono-beneficiary or collaborative
- **Technical thematic:** All

- **Synergy #:** **16**
- **Title:** **Clean Aviation Cascade funding**
- **Description:**

Clean Aviation Cascade funding could be a mechanism that allows to distribute public funding and assist beneficiaries, such as start-ups, scale-ups, SME and/or intermediate-sized enterprise, in the uptake or development of aeronautical innovation. Smaller calls could be issued by big industrial players in agreement with CAJU.

- **Funder:** CAJU and/or regional funding authorities and/or national funding bodies
- **Type of beneficiary:** SME and/or intermediate-sized enterprise
- **Level of funding:**
 - **Project budget size:** 100 k euros
 - **% of funding:** 70%
 - **Funder's envelope:** To be determined
- **TRL beginning and end:** 4-6
- **Type of project:** Mono-beneficiary
- **Technical topic:** CA key technologies
- **Duration of projects:** 18 months

- **Synergy #:** **17**
- **Title:** **Aeronautical IPCEI**
- **Description:**

An aeronautical IPCEI 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 is to accelerate innovation, reduce costs, and increase the competitiveness of the European aeronautics sector.

There are a number of advantages to having an aeronautical IPCEI:

- **Accelerated innovation:** An IPCEI would bring together the best minds in Europe to work on the most challenging aeronautical challenges. This would accelerate the development of new technologies and capabilities.
- **Shared costs:** An IPCEI would allow the costs to be shared across a number of European partners.
- **Increased competitiveness:** An IPCEI would help to ensure that Europe remains a leader in aeronautical technology.

An aeronautical IPCEI would be a major investment in the future of the European aeronautics sector. It would help to ensure that European aviation industry continues to thrive.

- **Funder:** Member states and European Commission
- **Type of beneficiary:** All
- **Level of funding:**
 - **Project budget size:** 5-70 million €
 - **% of funding:** 30-50%
 - **Funder's envelope:** To be determined
- **TRL beginning and end:** 5-7
- **Type of project:** Collaborative
- **Technical topic:** CA key technologies
- **Duration of projects:** 60 months

- **Synergy #:** **18**
- **Title:** **Co-funding with bi-lateral or three-lateral calls**
- **Description:**

Co-funding with bilateral or trilateral calls, eventually parallel, refers to a funding mechanism where two or three funding bodies collaborate to provide funding for a transnational project. A joint call

should be created, in which the funding bodies agree on a common set of criteria for selecting projects for funding, then jointly evaluate the proposals and select the projects that will be funded.

Co-funding with bilateral or trilateral calls can be used to support a wide range of projects on CA key technologies, including basic research, applied research, and demonstration projects.

- **Level of funding:** Regional funding bodies and/or national funding bodies and/or CAJU
- **Type of beneficiary:** All
- **TRL beginning and end:** 1-9
- **Type of project:** Collaborative
- **Technical topic:** CA key technologies

5. Conclusion

The ECARE project, which aims to promote innovation in the European aerospace sector, has identified 17 funding gaps and 18 synergy mechanisms and complementarities to address them from the four pilot regions: Nouvelle-Aquitaine and Occitanie in France, Campania in Italy, and Hamburg in Germany.

These gaps include a lack of funding for projects with a TRL of higher than 6, a lack of coordination and harmonization of funding processes across different funding bodies, and a lack of support for SMEs. **The synergy mechanisms were grouped into four categories: strategic alignment, communication and transparency, harmonization of processes, and new calls in public funding.**

The draft synergy mechanisms and complementarities presented in the preceding sections, that were identified and reported in this deliverable (D3.2) constitute the main output of WP3. They represent the synthesis of all the elements collected and elaborated in the project so far and they are based on a global study on the aeronautics public funding state of the art (done through mappings, interviews and national workshops) together with the personal insights of ECARE consortium member clusters. **They will provide inputs to the activities of WP4, aiming at developing concrete synergy mechanisms proposals to be implemented by European, national and regional stakeholders in France, Germany and Italy.** Additionally, WP4 will deliver recommendations and a set of methodologies that will be documented in a handbook that could be used for synergies elaboration in other European aeronautics countries and regions.