



ERA-LEARN

Toolbox and guidance on mechanisms for synergy creation for European partnerships

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Information

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Table of content

Contents

1. Synergies in European Partnerships.....	4
1.1. <i>Introduction</i>	4
1.2. <i>Definition of synergies</i>	5
1.3. <i>Typology of synergies</i>	6
2. Mechanisms for synergy creation.....	8
2.1. <i>Explore needs and opportunities</i>	9
2.2. <i>Unite behind common goals</i>	14
2.3. <i>Develop shared governance</i>	19
2.4. <i>Leverage internal and external resources</i>	23
2.5. <i>Improve knowledge valorisation</i>	26
2.6. <i>Accelerate transitions</i>	28

1. Synergies in European Partnerships

1.1. Introduction

Synergies are a crucial aspect of R&I policies and help tackle the “cross-cutting need to capitalise on the full potential of investments in R&I”, support “efficient public and private investments, capitalising on multiplier and leverage effects”¹ and help close existing knowledge and capacity gaps and reduce trade-offs.

In the light of the growing complexity of R&I and the need for accelerating transformative change towards sustainability, synergies can facilitate the creation of a more interconnected, inclusive, and effective R&I ecosystem tackling challenges and opportunities that lie at the crossroads of different partnerships, instruments, and EU policy priorities, and thus more broadly contribute to the development of transformative of R&I policy².

The establishment of synergies across the R&I landscape has been commonly linked to efficiency in using resources, experimentation with different sources of funding and pooling together resources. However, a much broader understanding of synergies is currently evolving, covering aspects of novelty, emergence and potential for amplifying processes and practices while mitigating trade-offs and undesirable effects. These can include strategic knowledge valorisations, forward-looking activities, purposeful development of ecosystems, etc.

Establishing synergies is paramount to achieving the EU's wider goals of green, digital, industrial, and just transitions and increasing the EU's resilience in view of current and future crises. The Prague Declaration on Synergies (2022) recognises for European Partnerships to identify and utilise synergies in several ways (see Table 1). Synergies are also featured as a cross-cutting theme in the Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe, bringing diverse examples of synergy creation to light.

¹Prague Declaration on Synergies, 2022

²The integration of key transformative R&I principles in European policies: A multiple case study analysis
<https://op.europa.eu/en/publication-detail/-/publication/8d937cf9-f9ea-11ed-a05c-01aa75ed71a1/>

Table 1 Opportunities for European Partnerships to act on synergies (Prague Declaration on Synergies, 2022).

1. Maintain the governance structures, which are to be as streamlined as possible to avoid duplication	2. Consider the synergic funding from other regional, national and EU programmes	3. Adapt and refine appropriately their management avoiding unnecessary administrative complexity	4. Align national and regional efforts with the incentives implemented to bring together a critical mass of resources
5. Reinforce contributions of Member States and Associated Countries to the partnerships	6. Reduce the administrative burden on beneficiaries engaging in the European Partnerships	7. Report on the complementary and cumulative funding from other EU funds (e.g., EU Cohesion Policy, Recovery and Resilience Facility, Connecting Europe Facility, etc.) to improve understanding of the barriers and drivers for synergies	

Building on these orientations, the guidance brings forward a consolidated understanding of the concept of synergy. It outlines goals, processes, and methods for synergy creation, focusing on European Partnerships. It gives an overview of the definition of synergies and some evidence on collaborations, strategies and methods used or envisioned to create synergies in the European Partnership landscape. It also presents a selection of good practice examples.

1.2. Definition of synergies

In the context of this toolkit, synergies are referred to processes and interactions between “agents” in a “system” that lead to results that could not be achieved by adding the contributions of agents working alone. The concept of synergies is significant not only for policy development but also various research fields³. In economics and business, joint efforts between individuals and organisations are expected to create synergies and thus lead to results that could not have been attained by acting alone. Synergies and related concepts often describe the efficiency increase through economies of scale, scope, density, and network effects, for example, through specialisation and division of labour, joint bearing of costs or proximity and larger numbers of “customers”. The term is also used concerning interactions between organisations (joint R&D activities) or as effects of mergers and acquisitions⁴ and management of organisations⁵.

³ Newman, M. E. (2011). Complex systems: A survey. arXiv preprint arXiv:1112.1440. <https://arxiv.org/abs/1112.1440>

⁴ Feldman, E. R., & Hernandez, E. (2022). Synergy in Mergers and Acquisitions: Typology, Life Cycles, and Value. *Academy of Management Review*, 47(4), 549-578. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3816956

⁵ Holtström, J., & Anderson, H. (2021). Exploring and extending the synergy concept—a study of three acquisitions. *Journal of business & industrial marketing*, 36(13), 28-41. <https://www.emerald.com/insight/content/doi/10.1108/JBIM-09-2020-0420/full/html>

Interactions between organisations or agents do not necessarily lead to synergies: "diseconomies" can occur through interactions, e.g., by duplication of effort, increased bureaucracy, trade-offs, and negative externalities. Meanwhile, in some situations, competition may result in "synergies" without explicit cooperation, particularly when rules are designed to favour the desired behaviour - a "mechanism design" approach in game theory.

1.3. Typology of synergies

Definitions, goals, and methods of synergy creation differ depending on the perspective and level of observation. Synergies may benefit one or a small number of agents, as in the example of mergers or cooperation between two companies. They may generate broad and significant benefits for citizens. In this regard, synergies and competition cannot be considered mutually exclusive. Synergy creation can be described through three different dynamics of interactions.

- Top-down synergy creation: Overarching policy goals and legal frameworks (e.g., at the EU level) can enable synergies between R&I initiatives (e.g., Partnerships).
- Cooperative synergy creation: Joint efforts based on mutual commitments and ambitions to align with one another.
- Indirect synergy creation: Synergies at a higher level, e.g., between Partnerships, may foster or facilitate synergies at a lower level, e.g., between stakeholders.

Synergies in the Partnership context could be classified depending on where they occur: between Partnerships' activities and stakeholders, between two or more partnerships. As well as between partnerships and other actors and funding sources. Synergies can also be created on various levels within the European and global policy landscape, namely with and between:

- Global and international (non-EU) programmes, initiatives, stakeholders.
- European initiatives and programmes.
- National and regional programmes and stakeholders.
- European R&I system pillars and instruments beyond the partnerships.
- Synergies among European partnerships.

Synergies can be created thematically within and between the Horizon Europe Pillars and destinations, and they are also partly dependent on the type of partnership and their function in the European R&I landscape. The synergy creation process between Partnerships can be bilateral in the case of clear, specific areas and multilateral in areas with considerable scope for multilateral collaboration. It is also possible to distinguish cumulative (bringing together), successive (building on one another) and concurrent (complementing each other) synergies⁶.

⁶ [Mission-oriented funding and instrument synergies - Publications Office of the EU \(europa.eu\)](https://publications.europa.eu/en/communication/mission-oriented-funding-and-instrument-synergies)

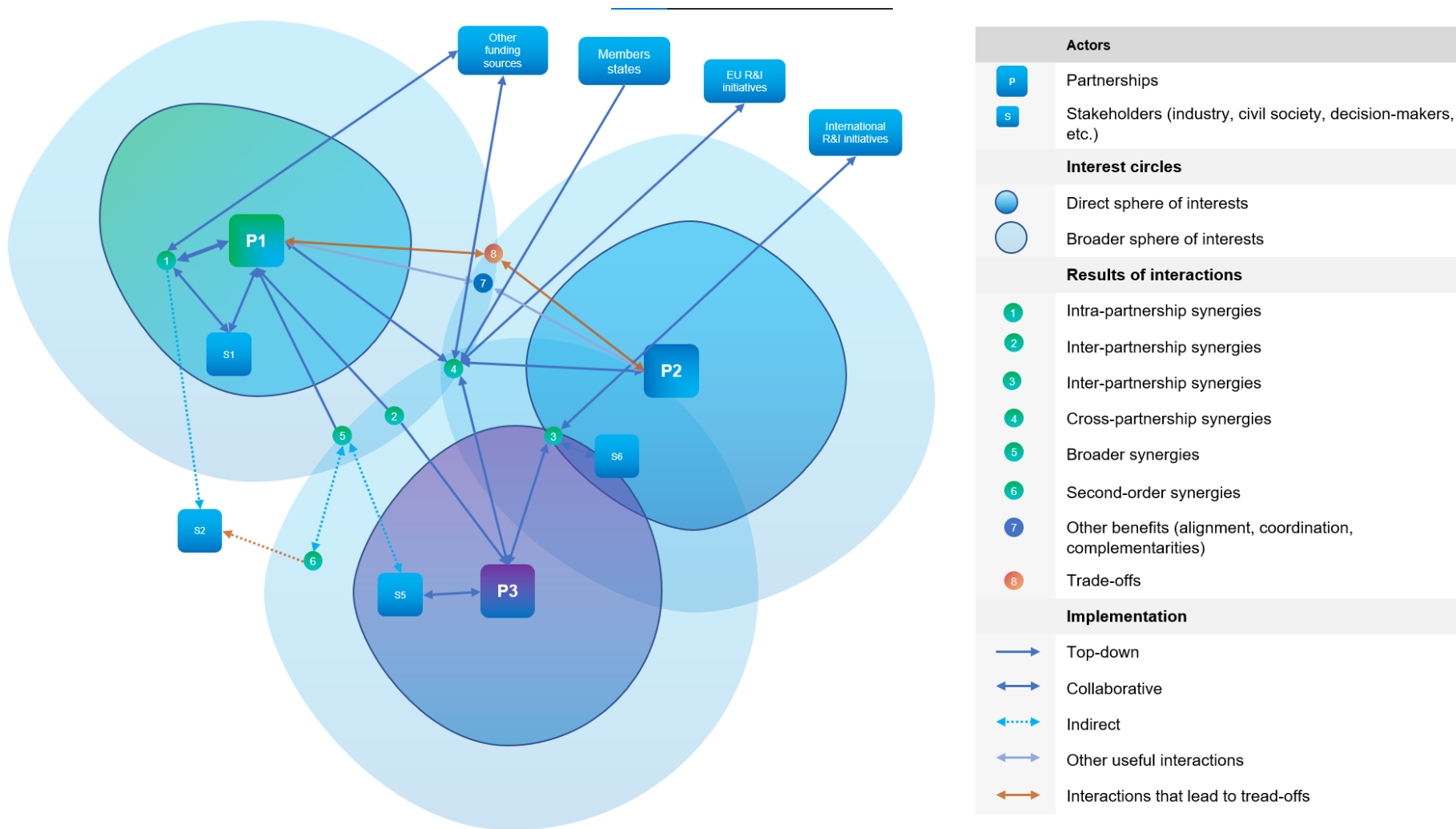


Figure 2 Conceptual map of synergies across European partnerships

The conceptual map (own elaboration) represents key actors and their interactions aiming at creating synergies. Each node is a meeting point of different actors where the interaction can lead to a specific result. The Direct sphere of interests represents strategic priorities of partnerships based on their impact pathways, while the Broader sphere of interests represents secondary or prospective interests. S7 specifically represents stakeholders that may not take part in any of the processes and be outside of the sphere of interest for any of the partnerships, but which may still be both positively and negatively impacted by the synergy creation processes (e.g. certain vulnerable groups).

2. Mechanisms for synergy creation

This chapter presents mechanisms for synergy creation structured by their broader purposes, building on the definition of synergy goals by the European Commission:

“By strengthening linkages and teaming up with other Horizon Europe initiatives, other MFF-funded programmes, and national, regional, and private programmes, future European Partnerships have better chances to deliver on the ambitious transitions and contribute to EU priorities and policies. Effective synergies maximise the possibility that successful research results are taken up and effectively deployed.”⁷

It is also important to consider that different actors might enter the processes of synergy creation with different individual goals and understandings of why synergies are needed and what they entail. A clear definition of the purpose of synergy creation can help facilitate the choice of the most appropriate methods in each specific context.

<i> Policymakers </i>	<i> R&I operators and initiatives </i>
Policymakers are likely to focus on the overarching policy objectives and the cooperation between "agents" that implement them to maximise the impact of funding.	R&I operators are likely interested in synergies that lead to more efficient use of resources, reaching common goals and enhancing stakeholder interactions.

Based on the analysis of available evidence about synergy creation processes across European partnerships, this guidance outlines the following six broad purposes for synergy creation:

- Exploring needs and opportunities
- Uniting behind common goals
- Developing shared governance
- Leveraging internal and external resources
- Improving knowledge valorisation
- Accelerating transitions

The following subchapters detail possible mechanisms for synergy creation depending on the specific purpose, while different mechanisms can also have more than one purpose.

⁷ EC (2020), [Report on Coherence and Synergies of candidate European Partnerships under Horizon Europe](#),

2.1. Explore needs and opportunities

European partnerships are frequently exposed to common challenges and risks, while their thematic priorities can be linked with and across the Clusters. Their stakeholders may also overlap. This sets the stage for pursuing mutual understanding that can lead to synergies stemming from better coordination, improved understanding of diverse stakeholder needs and envisioning mutually beneficial futures.

Foresight

Foresight is used when future development is uncertain, and more information is needed for Partnerships to address the challenge.

Why	Foresight activities aim to provide a structured analysis of future developments, build a common strategic vision to address these and identify possible future common strategic research topics. The goal of joint foresight is to inform decision-making and stimulate action.
Description	Joint, collaborative efforts of multiple stakeholders or organisations to anticipate and envision potential future scenarios, trends, and challenges can help to gain a deeper understanding of emerging developments and collectively explore possible pathways and implications for decision-making and strategy. Common foresight methods include scenario planning, horizon scanning, workshops and mega-trends analysis ⁸ .
Actors	Flexible
Modes	Usually top-down initiative, collaborative implementation
Efforts required	Moderate to Significant

⁸ Daheim, C. (2023). Mutual Learning Exercise R&I Foresight: An Introduction to the Current State of Play. <https://op.europa.eu/en/publication-detail/-/publication/5bc613d1-a5d8-11ed-b508-01aa75ed71a1/language-en>

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Co-creation fosters a sense of ownership, encourages diverse perspectives, and enhances the likelihood of generating innovative and inclusive future scenarios and strategies. — Mutual learning: through discussions, workshops, and collaborative activities, stakeholders can share experiences, best practices, and lessons learned, gaining a better collective understanding of the context, common goals and collaboration areas — Action-oriented outcomes: by collectively exploring future scenarios and trends, participants can identify potential strategies, policies, and initiatives to address emerging challenges and capitalise on opportunities. 	<ul style="list-style-type: none"> — Diverse Perspectives and Interests: foresight often involves stakeholders with diverse backgrounds, interests, and priorities. Balancing these varied perspectives and ensuring inclusive participation can be challenging. — Collaboration and coordination: effective collaboration among multiple organisations or stakeholders requires coordination and communication. — Resource Constraints: Joint foresight can require significant resources regarding time, expertise, and funding. — Implementation and Action Gap: While joint foresight can generate valuable insights and strategies, there can be challenges in translating these into actionable plans.

Case: JPI Oceans Foresight

JPI Oceans embedded foresight from the start (Foresight for JPI Oceans - Definition and review of relevant processes) at a strategic level to inform the strategy-making process in JPI Oceans, to update the Strategic Research and Innovation Agenda, and to support the implementation of concrete activities.

<https://jpi-oceans.eu/archive/foresight.html>

Case: Blue Bioeconomy COFUND

In 2022 BlueBio organised a foresight process to develop the future European Strategic Knowledge and Innovation agenda within the blue bioeconomy with the participation of stakeholders from the blue bioeconomy and all links of the value chain.

<https://jpi-oceans.eu/en/bluebio-foresight-workshop>

Learn more:

Competence Centre on Foresight: https://knowledge4policy.ec.europa.eu/foresight_en#tools

Foresight on Demand: European Commission Services: <https://www.foresight-on-demand.eu/>

Daheim, C. (2023). Mutual Learning Exercise R&I Foresight: An Introduction to the Current State of Play. <https://op.europa.eu/en/publication-detail/-/publication/5bc613d1-a5d8-11ed-b508-01aa75ed71a1/language-en>

Stakeholder consultations

Why	Strategic planning of research, innovation, and valorisation strategies benefits from early-on stakeholder engagement. Stakeholder consultations allow for grasping the diversity and heterogeneity of different actors' needs, goals, challenges, and frames on a shared issue or topic.
Strategy	Stakeholder consultations are a specific form of stakeholder engagement often used at the early stages of R&I. However, they can also occur at any point in time and serve a wide range of goals. Gathered inputs can be synthesised and applied within SRIAs or planning future activities.
Actors	Regional, national, and European policymakers, scientific experts, industry, end-users/applicants, civil society, and respective networks
Level	From local to multi-level
Interactions	Not strictly defined
Efforts required	Coordinators: Minimum to Moderate Participants: Minimum

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none">— A better understanding of different perspectives early-on— Greater stakeholder awareness across the ecosystem	<ul style="list-style-type: none">— Uneven willingness and capacity to engage by different stakeholder groups— Superfluous engagement can lead to further segregation and exclusion

- More relevant results
- Can inform future engagement, coordination and collaboration options

- Limited overlap of broad interests

Case: P4Planet and Clean Steel

The partnerships have started discussions at the stage of their SRIAs development through regular meetings within broader contexts, including A.SPIRE, ESTEP and EUROFER.

Case: DUT – Driving Urban Transition Stakeholder Consultation

Cooperation, consultation, and co-creation with urban stakeholders are key to creating a strong community around urban transitions and establishing a well-known research and innovation platform to help cities become more sustainable, inclusive, climate-neutral and liveable. The open stakeholder consultation was the first step of the scoping process, intending to define the topics for the second DUT call to be launched in September 2023.

Learn more

Biodiversa+ Stakeholder Engagement Handbook: Guidelines for Stakeholder Engagement: <https://www.biodiversa.eu/wp-content/uploads/2022/12/stakeholder-engagement-handbook.pdf>

DUT Scoping for the DUT call 2023, [Invitation-to-Stakeholder-Consultation-.pdf \(duet partnership.eu\)](#)

R&I mapping

Joint mapping can be used if future developments of the concerned challenge are identified and a common vision is built. However, the research needs or strategic priorities must still be identified based on existing national strategies and programmes.

Why

The purpose of mapping R&I activities is to gain a comprehensive overview of the research and innovation landscape, understand the existing collaborations and gaps, identify trends and emerging focus areas, and facilitate strategic decision-making. Joint mapping of regional, national, and European research strategies and programmes and activities of other partnerships allows for identifying complementarities and opportunities for shared added value creation.

Description	Mapping R&I activities involves systematically identifying, categorising, and analysing research and innovation initiatives, projects, institutions, and stakeholders within a particular field or domain.
Actors	Key actors: European Partnerships Participants: regional and national stakeholders
Implementation	Collaborative
Efforts required	Leadership/coordinators: Moderate Other participants: Moderate

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — <u>Wide applicability</u>: a common mapping methodology for all (countries, industries, R&I communities) — <u>Greater transparency</u>: information-sharing on national and international research strategies and activities. — <u>Birds-eye view</u>: possibility to obtain an overall picture of R&I activities and identify research gaps and potential synergies. — <u>Better-informed decision-making</u>: identifying potential transnational strategic priorities while avoiding duplication — <u>Networking</u> amongst experts (including researchers, policymakers, and other stakeholders across the EU). 	<ul style="list-style-type: none"> — <u>Diverging frames and priorities</u>: it can be difficult to reach a mutual understanding about the scope of joint mapping. — <u>Heterogenous data</u>: interdisciplinary scientific scope of JPIs, the diversity of funding agencies and national research programmes, and the variable involvement of participants may complicate the compatibility and comparability of available data — <u>Limited relevance</u>: mapping results may soon become obsolete under rapidly evolving activities and external contexts.

Case: Mapping of Biodiversity Research Infrastructures

The mapping by Biodiversa engaged 39 stakeholders, including ministries, national innovation and science funds, research councils, academies of science and research centres

and other high-level stakeholders responding to the need for mapping research infrastructures for biodiversity and ecosystem services in Europe, allowing for the high-level synthesis of knowledge paired with critical analysis of existing needs, gaps, and opportunities. The report summarised available facilities, accessibility, and potential integration within the BiodivERsA framework. The objective of the exercise was to investigate and analyse the European landscape of biodiversity research infrastructures to summarise available facilities, accessibility, and potential integration within the BiodivERsA framework.

Manrique E., Blery C., Le Roux X., Mandon C. and all BiodivERsA partners. (2021). BiodivERsA Mapping of Biodiversity Research Infrastructures. BiodivERsA report, <https://www.biodiversa.eu/wp-content/uploads/2022/12/mapping-biodiversity-research-infrastructures.pdf>

2.2. Unite behind common goals

Horizon Europe Strategic Plans outline multiple connections across the Clusters with overlapping Key Strategic Objectives and, in some key cases, common impact areas. Likewise, with several European Partnerships represented across Clusters, there are possible strategic priorities and impact pathways overlaps. This provides a shared ground for different degrees of collaboration, from joint statements and calls to co-development of research agendas as a foundation for long-term synergy creation.

Joint statements

Why	Joint statements help partnerships emphasise shared goals and priorities without making detailed commitments at the early stages of collaboration or around topics that have not been elaborated in great detail.
Description	Joint statements may include Memorandums of Understanding (MoU), Joint narrative and Docking points, and Joint declarations. Such statements can highlight shared visions and significant R&I prospects.
Actors	European Partnerships
Implementation	Collaborative
Efforts required	Minimum to Moderate

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Minimum efforts required — Greater stakeholder awareness 	<ul style="list-style-type: none"> — Limited impact if no further steps are taken

Case: A.SPIRE, EUROFER and ESTEP

The joint declaration was signed in 2019 and featured proposed Circular and Carbon Neutral Industry and Clean Steel-Low Carbon Steelmaking partnerships for Horizon Europe.

<https://www.estep.eu/assets/CSP-letters/20190923-SPIRE-CLEAN-STEEL.pdf>

Case: BBI JU and SPIRE

Public-private partnerships BBI JU and SPIRE published a joint statement on team-up for synergy of actions.

<https://www.aspire2050.eu/news/new/public-private-partnerships-bbi-ju-and-spire-publish-joint-statement-team-synergy-actions>

Case: Clean Aviation and synergies with national and regional policies

Clean Sky 2 has signed eighteen Memorandums of with Member States and regions, leading to 50+ projects supported by ESIF for more than EUR 50 million in total. The Clean Aviation JU aims to further develop synergies with Research and Innovation Smart Specialization Strategies using European Regional Development Fund Operational Programmes.

https://clean-aviation.eu/sites/default/files/2022-11/CleanAviation-synergies-report_en.pdf

Joint calls

Why

Joint calls provide a platform for fostering collaborative research and innovation, promoting cross-border cooperation, and addressing shared challenges. Combining resources, expertise, and perspectives from two or more partnerships can lead to more impactful outcomes and advance Europe's competitiveness and capacity for innovation. By involving multiple partners from different countries or sectors of the different

	partnerships, joint calls can address challenges that have cross-border or cross-sector implications.
Description	Two or more European Partnerships can organise joint transnational calls on topics of mutual interest. Each partner brings unique expertise, infrastructure, and networks to the collaboration, enhancing the overall quality and impact of the project. Established collaborations can extend beyond the duration of the specific project and form the foundation for future knowledge exchange, and joint initiatives.
Actors	European Partnerships
Implementation	Collaborative
Efforts required	Moderate to Significant Other participants: Variable

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Joint calls between different partnerships can enable them to tap into a wider pool of expertise and knowledge. — Joint calls enable partners to leverage their complementary strengths, capabilities, and resources. By leveraging these synergies, partners can address research and innovation challenges more effectively. — Joint calls of European Partnerships can leverage funding from multiple sources. This allows partners to pursue more ambitious and impactful R&I initiatives that require larger investments. — Joint calls may facilitate research and innovation activities that are relevant and impactful on a broader scale. — Joint calls contribute to the development of robust networks and relationships between partnerships. Collaborating can 	<ul style="list-style-type: none"> — The challenge for applicants is to respect and respond to the different national requirements of transnational joint calls (low attractiveness of calls). — Low awareness of the network's management rules can lead to confusion. — Potentially additional administrative burden. — Potentially variations in the financial support received by selected applicants from countries outside the Eurozone. — Some funding agencies face limitations in funding transnational research (quota). — The challenge to turn this action into a longer-term activity: Difficulties include securing the human and financial resources and agreeing upon a longer-term strategy for launching calls

foster trust and understanding among partnerships

Case #1: Water4All Joint Calls

Water4All has launched several joint transnational calls, including with the FACCE JPI (2016, 21 projects funded), the EraNet Biodiversa (2020, 22 projects funded), and the JPIs AMR and Oceans (2020, 18 projects funded). The 2022 joint transnational focused R&I projects aimed at delivering knowledge, models, approaches, tools and methodologies to better understand and respond to hydrological processes across scales. The call considers the Water Framework Directive and aims to contribute to the European Green Deal, Just Transition and the SDGs, and foster innovative governance models with enhanced participation of stakeholders in water management issues related to extreme events.

<https://www.water4all-partnership.eu/joint-activities/water4all-2022-joint-transnational-call>

Case #2: BATT4EU

BEPA and EGVIafor2Zero, the private-sector association within the 2ZERO partnership, were both interested in a call to establish an LCA methodology for their respective scopes. After consultation with the European Commission, experts from BEPA and EGVIafor2Zero worked together to define a call scope beneficial for both partnerships. The joint call focused on developing a commonly accepted LCA for zero-emission vehicles and their batteries. Still, the approach should also apply to other applications of the same types of battery cells. It was taken up in the 2021-22 Work Programme as HORIZON-CL5-2021-D5-01-04.

Co-development of strategic agendas

Why	Synergy actions at the strategic level should be tailored around the European Partnerships' strategic research and innovation agendas.
Description	The development of strategic research and innovation strategies (SRIA) in European Partnerships is the main mechanism to define what challenges the participating EU Member States and industries want to address jointly and what research priorities the countries have in common. Developing and agreeing with a common strategic implementation plan of the SRIA ensures that concrete actions and instruments are defined and developed to research the strategic

	objectives. Developing an implementation plan also calls for concrete commitment of resources for the implementation of the SRIA, such as joint research actions at operational and financial levels (knowledge hubs, alliances, and sharing of research infrastructure and data).
Actors	European Partnerships
Implementation	Collaborative
Efforts required	Significant

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Cost-effective, especially for expensive infrastructure/equipment — Increased research capacity of countries with less financial resources: benefit from cutting-edge infrastructure/equipment — Standardisation of data collection and research methods — Integration of national research activities — Community- and capacity-building at the European level — Increased potential for joint impact on international policy-making 	<ul style="list-style-type: none"> — The challenge to effectively ensure access to infrastructure for countries with funding limitations — Knowledge gap from less research-intensive countries to be addressed — Legal barriers for data sharing and re-use, e.g. some countries cannot use data that has been elaborated at a transnational level for national purposes

Case: SPIRE cPPP and BBI JU

Since 2016, BBI JU and SPIRE have been jointly exploring collaborative ways of maximising their impacts. They have established a joint working group to ensure complementarities, coherence, and mutual understanding at different levels. The collaboration effort enabled full alignment of strategic agendas and work plans while emphasising further complementarity and striving for synergy between topics.

Learn more

The ERA-LEARN “Guide for the SRIA Development Process” shows how SRIAs can be developed, and which methods can be used for developing Strategic Research and Innovation Agendas. <https://www.era-learn.eu/support-for-partnerships/additional-activities/strategic-research-and-innovation-agendas/guide-for-the-sria-development-process>

2.3. Develop shared governance

More open and transparent governance approaches, cross-partnership platforms and broadening the scope of R&I represent a significant opportunity for more inclusive, relevant and dynamic R&I processes, capable of generating long-term continuity of results and allowing to establish more resilient collaborations that are less dependent on each specific actor. Collaborative forms of governance have been highlighted as beneficial in diverse sustainability contexts⁹ and are considered particularly important in the context of policy failures¹⁰.

Open and transparent frameworks

Why	Great transparency has been a growing topic in the context of sustainability transitions ¹¹ , while responsible and open science practices are of great importance to civil society ¹² and to expanding the positive impacts of R&I.
Description	More open and transparent R&I frameworks prioritise inclusive and participatory processes across all phases, creating conditions for stakeholders to engage on their terms and enhancing the quality of engagements and the relevance and usability of outcomes.
Actors	Not strictly constrained
Implementation	Collaborative, hybrid

⁹ Florini, A., & Pauli, M. (2018). Collaborative governance for the sustainable development goals. *Asia & the Pacific Policy Studies*, 5(3), 583-598.

¹⁰ Van Renssen, S. (2018). The inconvenient truth of failed climate policies. *Nature Climate Change*, 8(5), 355-358.

¹¹ Gupta, A., Boas, I., & Oosterveer, P. (2020). Transparency in global sustainability governance: to what effect?. *Journal of environmental policy & planning*, 22(1), 84-97.

¹² Public consultation on the past, present and future of the European research and innovation Framework Programmes 2014-2027 https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/results-public-consultation-future-eu-research-and-innovation-programmes-are-now-public-2023-04-19_en

Efforts required	Significant, however, with relatively low entry barriers for newcomers
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<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Higher levels of mutual understanding and trust — Enhanced access to the state-of-the-art research — Long-term benefits in terms of developing the R&I ecosystem and positive impacts on society at large 	<ul style="list-style-type: none"> — Complex to set up — Potentially hard to manage, including in the context of significant differences in stakeholder capacities — Requires long-term commitment and continuous investment

Case #2: PARC

PARC is a collaborative effort that brings together 200 partners from 28 European countries and aims to develop next-generation chemical risk assessment to protect human health and the environment. The PARC Governance structure has been devised to foster open and transparent processes encompassing Coordination and Exchange and Advisory bodies. PARC has established SYNnet, a network to facilitate collaboration and knowledge sharing with other initiatives focusing on environmental, food, and human health issues and organisations working in chemical risk assessment. PARC welcomes collaborations and encourages the participation of new entities that can contribute to its goals.

<https://www.eu-parc.eu/about-us/governance>

Learn more

Joint Research Centre & EIT Climate-KIC (2022). Policy co-creation for mission-oriented policies. Participatory methodologies to structure multi-stakeholder policy-making processes <https://eit.europa.eu/library/co-creation-policy-participatory-methodologies-structure-multi-stakeholder-policymaking>

Inter-partnership assemblies

Why

Inter-partnership assemblies provide a broadly shared foundation for future development based on shared priorities or thematic areas of interest across multiple partnerships.

Description	Inter-partnership assemblies target high-level coordination that stimulates synergies around specific technologies or themes such as electrification, cities and built environment, and manufacturing.
Actors	European Partnerships
Implementation	Top-down / Hybrid
Efforts required	Moderate to Significant

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Possibility to build synergies around broad topics of shared interest 	<ul style="list-style-type: none"> — The long-term prospects of inter-partnership assemblies compared to other mechanisms for generating synergies remain unclear

Case: Clean Planet Inter-Partnership Assembly

The Clean Planet Inter-Partnership Assembly was launched in December 2020 by the European Commission to harmonise and align the multi-annual work programmes of the different partnerships (including within Horizon Europe). It also specifically focuses on common enabling technologies that can contribute to climate neutrality.¹³

Expanding R&I Ecosystems

Why	The need for expanding the R&I ecosystem to include a broader range of actors stems from the possibility of making R&I more informed and relevant to society but also from providing greater awareness for different actors about the significance of R&I for tackling societal challenges and growing their willingness to engage in tackling barriers to deployment.
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¹³ Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe <https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/a6cbe152-d19e-11ec-a95f-01aa75ed71a1>

Description	Expanding R&I ecosystems refers to greater engagement with stakeholders in specific projects or partnerships and in a broader context of R&I development and co-creation of change. It is also about understanding the various ways R&I actors can contribute to sustainability transitions through transformative solutions ¹⁴ .
Actors	Not strictly limited
Implementation	Hybrid
Efforts required	Significant

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Enhanced dissemination of research results — <u>Knowledge sharing and transfer</u> across the partnership stakeholder ecosystem results in the cross-pollination of pieces of knowledge and experiences — <u>Better collaboration and coordination:</u> based on gaining a better understanding of actor perspectives 	<ul style="list-style-type: none"> — <u>Uneven benefits</u> of knowledge valorisation to different actors — Knowledge might not always reach the desired target audiences

Case: Biodiversa+ & Network Nature

Biodiversa+ focuses on the systematic engagement of environmental policy actors (ministries of environment, environmental protection agencies, ministries of research, funding agencies and foundations) as key partners in carrying out R&I. It also elevates impact through being a partner of Network Nature that creates opportunities for local, regional and international cooperation to maximise the impact and spread of nature-based solutions.

¹⁴ Reforming and enhancing the EU research and innovation system: https://rea.ec.europa.eu/funding-and-grants/horizon-europe-reforming-and-enhancing-european-ri-system/reforming-and-enhancing-eu-research-and-innovation-system_en

<https://www.biodiversa.eu/>
<https://networknature.eu/>

Case: EDCTP + WHO

WHO and EDCTP collaborate at strategic and technical levels, including cross-participation in technical and working groups and committees. EDCTP is part of the WHO R&D Blueprint Global Coordination Mechanism and the WHO Global Malaria Programme.

Learn more

ERIN – Place-based innovation ecosystems: <https://errin.eu/RI-Policy/ecosystems>

2.4. Leverage internal and external resources

Given their complex structure and involvement of impactful stakeholders, each partnership upholds unique and significant resources, which can often be utilised to generate shared benefits and foster co-creation. Through their networks, partnerships also have access to specific funding opportunities and finance mechanisms that, when leveraged together, could generate new benefits and positive externalities.

Shared research infrastructures

Why	Strategic needs at the EU level and uneven or limited access to research (including by specific stakeholder groups) can be tackled through developing joint or shared research infrastructures with increased potential for joint impact on international policy-making.
Description	Shared research infrastructures can range from expanding access to the existing infrastructures to creating new tailored infrastructures serving specific stakeholder needs. This may include establishing a new joint infrastructure, e.g., laboratories, databases, and archives.
Actors	R&I operators, national R&I and funding agencies, EU R&I ecosystem actors
Implementation	Not strictly defined
Efforts required	Coordinators: Significant, Participants: Minimum to Moderate

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Cost-effective, especially for expensive infrastructure/equipment — Increased research capacity of countries with less financial resources: benefit from cutting-edge infrastructure — Standardisation of data collection and research methods — Integration of national research — Enables community- and capacity-building at the European level 	<ul style="list-style-type: none"> — The challenge to effectively ensure access to infrastructure for countries with funding limitations — Knowledge gap from less research-intensive countries to be addressed — Legal barriers for data sharing and re-use, e.g., some countries cannot use data that has been elaborated at the transnational level for national purposes

Case: Central European Research Infrastructure Consortium

CERIC is an innovation ecosystem for industry, offering services and technologies, technical and scientific knowledge and skills, and strong industry expertise, with a strategic outlook in nanotech. It integrates and provides open access to some of Europe's most advanced analytical facilities to help science and industry advance in all fields of materials, biomaterials, and nanotechnology, with a focus on energy materials and life sciences. With a single-entry point to some of the leading national research infrastructures in 8 European countries, it delivers innovative solutions to societal challenges in energy, health, food, cultural heritage and more.

<https://www.ceric-eric.eu/>

Case: European Strategy Forum on Research Infrastructures,

ESFRI, the European Strategy Forum on Research Infrastructures, is a strategic instrument to develop Europe's scientific integration and strengthen its international outreach. It was established in 2002, with a mandate from the EU Council to support a coherent and strategy-led approach to policy-making on research infrastructures in Europe and to facilitate multilateral initiatives leading to the better use and development of research infrastructures

<https://www.esfri.eu/forum>

Co-investment programmes

Why	Co-investment helps actors support shared strategic priorities while reducing individual burden, which is particularly important under significant investment needs and associated risks, as well as when there is a need for moving forward at different phases of R&I.
Description	Jointly financing R&I programmes or initiatives helps improve funding allocation and creates the bases for co-developing strategic agendas that address existing needs and tackle challenges on a greater scale.
Actors	R&I operators, national R&I and funding agencies, EU R&I ecosystem actors and networks
Implementation	Collaborative
Efforts required	Significant

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Effective use of resources to achieve similar or common goals — Co-development of innovative and transformative funding instruments — Opportunity to effectively address similar needs of common stakeholders 	<ul style="list-style-type: none"> — The interest of co-investment partners may not align on all points — The approach requires a clear understanding of specific needs and the scope of co-investment — Coordination to align communication and funding mechanisms in place

Case: EIF Health and EIF

“EIT Health and the European Investment Fund (EIF) jointly operate the Venture Centre of Excellence (VCOE), a public-private co-investment programme financing SMEs in Europe’s health sector. VCOE connects life science investors with high investment capacities with highly qualified pan-European SMEs. Companies receive support to fundraise and can access EIT Health support in their Series A, B and up to pre-IPO fundraising rounds.

Case: EIT Climate KIC

EIT Climate-KIC invites funders to develop further existing entrepreneurship programmes. CDC Group is funding the Adaptation and Resilience Challenge in 2021 with an adaptation and resilience-specific accelerator programme supporting 15 start-ups. Irish Aid also increased its funding to integrate gender mainstreaming tools into EIT Climate KIC programmes.

Case: EDCTP + ESSENCE

EDCTP participates in the ESSENCE Health Research platform. This initiative enables donors and funders to identify synergies, enhance coherence and increase the value of health research resources, fostering smarter scientific investment. EDCTP is also a member-observer of the Global Research Collaboration for Infectious Disease. Preparedness GloPID-R network is an alliance bringing together research funding organisations on a global scale to address future pandemics and epidemics. This allows EDCTP to track global and international priorities, developments and needs concerning funding.

2.5. Improve knowledge valorisation

R&I can be a powerful actor in creating solutions to many of the challenges faced by society. Climate change, environmental protection, an ageing population, the new data economy, cybersecurity, sustainable prosperity, and the future of transport are some areas where the rapid uptake of results and scaling of demonstrations is imperative.

Knowledge valorisation and cross-fertilization of results

Why	By translating excellence into action, the EU will be more ready to face the future. Valorisation allows for promoting knowledge and technology use, intellectual property management and the involvement of the citizens, academia, and industry. Valorisation that data, research results and innovations are turned into solutions with economic value and societal benefits.
Description	Knowledge valorisation is creating social and economic value from knowledge by linking different areas and sectors and transforming data, know-how and research results into sustainable products, services, solutions, and knowledge-based policies that benefit society. European Partnerships can jointly elaborate strategies to

	strengthen knowledge valorisation principles' application in European Partnerships' funded research.
Actors	Not strictly defined
Implementation	Top-down / Hybrid / Indirect
Efforts required	Leadership/coordinators: Significant Other participants: Minimum to Moderate

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — <u>Pooling of resources</u>, critical mass and economies of scale for valorisation strategies with similar groups of stakeholders in areas of mutual interest. — <u>More diverse perspectives</u> and expertise from different organisations or disciplines and enhancement of problem-solving capabilities. — <u>Expanded networks and better market access</u> through broader networks, including industry partners, investors, and potential customers. This may enable the scaling up of innovations. — <u>Risk sharing</u> and lower costs for implementation of knowledge valorisation 	<ul style="list-style-type: none"> — <u>Need for clear agreements</u> on IP ownership, protection, and exploitation. — <u>Conflict of interest can arise from</u> Individual goals and priorities that may not fit a joint approach. — <u>Managing joint knowledge valorisation</u> requires effective coordination mechanisms and governance structures. — <u>Possible need to share sensitive information</u>, including research data and innovation results. Establishing clear data sharing and confidentiality protocols is essential.

Case: EU Knowledge Valorisation Platform

The Knowledge Valorisation Platform connects players in Europe with the ambition to turn research results into sustainable products and solutions for the public good - be it economic or environmental benefits, social progress or improved policy making.

https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/eu-valorisation-policy/knowledge-valorisation-platform_en

Learn more

Guiding Principles for knowledge valorisation: https://research-and-innovation.ec.europa.eu/document/download/2d9fd6be-e292-48aa-b32a-586927f33863_en

Council Recommendation (EU) 2022/2415 of 2 December 2022 on the guiding principles for knowledge valorisation <http://data.europa.eu/eli/reco/2022/2415/oj>

Mutual Learning Exercise on Knowledge Valorisation <https://ec.europa.eu/research-and-innovation/en/statistics/policy-support-facility/psf-challenge/mutual-learning-exercise-knowledge-valorisation-focus-skills-intersectoral-cooperation-and-incentive>

2.6. Accelerate transitions

European Partnerships contribute to developing innovations and solutions for broad societal challenges. There is a growing range of mechanisms focused explicitly on the transformative processes that challenge existing norms while providing a clear orientation, frameworks, and tools for transforming the economy and society towards sustainability.

Developing future-fit capacities

Why	Capacity development in the context of accelerating transitions refers to the process by which individuals and organisations obtain, improve, and retain the skills and knowledge needed to engage in transformative processes, including strengthening the capacity of policy and societal stakeholders to participate in political and socio-economic arenas in pursuit of specified objectives.
Description	<p>Capacity is broadly defined as the ability of individuals, institutions, and societies to perform functions, solve problems, and set and achieve objectives sustainably. On a transnational level, joint actions can be pursued to enhance the capacity building of researchers, policymakers and practitioners at the European level.</p> <p><u>Dedicated joint training</u> can be used to build communities of practice for researchers, policymakers or practitioners from different countries. This includes an exchange of experience and joint learning. Training can also be more indirect, e.g., within Funding Agency Working Groups, where joint learning enables building a transnational community of practice.</p> <p><u>Mobility of researchers, policymakers and practitioners</u> helps develop a common understanding of practices, facilitates learning, and enables the establishment and implementation of joint R&I actions across countries.</p>

	<p>While the mobility of policymakers and practitioners can help understand other countries' policy- and decision-making processes.</p> <p><u>Targeted capacity building</u> can also help actors take on more complex roles (such as knowledge brokers or reflexive facilitators) spanning beyond their usual scope of activities in the synergy-generation processes for R&I.</p>
Actors	Researchers, policymakers, civil society leaders, industry forerunners
Implementation	Top-down / Collaborative / Indirect
Efforts required	Coordinators: Moderate to Significant Other participants: Moderate to Significant

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — More effective R&I ecosystem: Capacity building can enable a more informed orientation of R&I development and enhance chances of delivering broader societal and environmental benefits — Stronger capacities of specific stakeholders for identifying, designing and utilising synergy-generating activities 	<ul style="list-style-type: none"> — Different backgrounds of stakeholders may constrain mutual learning — Competing priorities may constrain sharing of experience — Institutional barriers, as well as time and resource constraints, might limit the possibilities for long-term capacity development

Case: Clean Steel Partnership

The partnership focuses on creating synergies with EU and national programmes, including in the area of upskilling of the steel workforce, including collaboration between EU companies participating in the clean steel value chain and broader initiatives. Collaboration among steel producers can reduce required investments.

Learn more

Mukherjee, I., Coban, M. K., & Bali, A. S. (2021). Policy capacities and effective policy design: A review. *Policy sciences*, 54(2), 243-268. <https://doi.org/10.1007/s11077-021-09420-8>

OECD (2020). Building Capacity for Evidence-Informed Policy-Making: Lessons from Country Experiences <https://www.oecd-ilibrary.org/sites/5a6c7d8a-en/index.html?itemId=/content/component/5a6c7d8a-en>

Fazey, I., Schöpke, N., Caniglia, G., Patterson, J., Hultman, J., Van Mierlo, B., ... & Wyborn, C. (2018). Ten essentials for action-oriented and second-order energy transitions, transformations and climate change research. *Energy Research & Social Science*, 40, 54-70. <https://doi.org/10.1016/j.erss.2017.11.026>

Upscaling

Why	Upscaling responds to the need for rapid and broad change in dominant systems or modes of production through which niche innovations can offer feasible alternatives.
Description	Synergies can be created through linking R&I, market deployment roadmaps and industrial strategies. Upscaling patterns may include but are not limited to growing, replication, accumulation, and transformation, paired with the development of networks and ongoing learning ¹⁵ . Upscaling can mean the expansion of economic activity but also the mainstreaming of desirable practices.
Actors	Public and private sector actors, industry forerunners, SMEs
Implementation	Top-down or Hybrid
Efforts required	Leadership/coordinators: Significant Other participants: Significant

<i>Benefits</i>	<i>Challenges</i>
— Higher impact of solutions developed in European Partnerships	— Limited knowledge is available on the actions and instruments for setting the right framework conditions for upscaling and replicability

¹⁵ Naber, R., Raven, R., Kouw, M., & Dassen, T. (2017). Scaling up sustainable energy innovations. *Energy Policy*, 110, 342-354.

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| <ul style="list-style-type: none"> — Changes in the behaviour of many actors in Europe ultimately change the system and respond to societal challenges — Possibility to close the implementation-replication gap | <ul style="list-style-type: none"> — Involvement of new actors in European Partnerships or respective close cooperation with other actors/networks at national and European level |
|--|--|

Case: Lighthouse Projects EU-FP

Lighthouse projects were featured as a collaboration to pave the way to the EU market for Smart City solutions through several means focused on upscaling and mainstreaming, including showcasing them to decision-makers and shifting Smart City technologies out of the private and technical sectors into the public mainstream, giving confidence to the market.

<https://smart-cities-marketplace.ec.europa.eu/sites/default/files/LighthouseProjectsCooperationManifestoSigned.pdf>

Learn more

Lam, D. P., Martín-López, B., Wiek, A., Bennett, E. M., Frantzeskaki, N., Horcea-Milcu, A. I., & Lang, D. J. (2020). Scaling the impact of sustainability initiatives: a typology of amplification processes. *Urban Transformations*, 2(1), 1-24. <https://doi.org/10.1186/s42854-020-00007-9>

Deep demonstrations

Why	Deep Demonstrations allow us to scale efforts on systems innovation and generate pathways for radical transformations across countries, cities, regions, industries, and value chains ¹⁶ .
Description	Deep Demonstrations are often delivered as “systems innovation as a service” to ambitious challenge owners. The methodology is based on four iterative non-linear components ¹⁷ :

¹⁶ <https://www.climate-kic.org/programmes/deep-demonstrations/>

¹⁷ <https://www.climate-kic.org/wp-content/uploads/2021/10/Deep-Demonstrations-Methodology.pdf>

	<p><u>Intent</u>: engaging ambitious challenge owners to secure demand for transformational change and develop the innovation portfolio.</p> <p><u>Frame</u>: mapping out systems to identify where and how innovation portfolio can catalyse change using leverage points. Different types of innovation approaches can be considered, e.g. social innovation, finance innovation, policy innovation, etc.</p> <p><u>Portfolio</u>: a portfolio of 30 to 100 connected innovations tackling identified leverage points is developed and managed, and new exploratory calls continue to be launched.</p> <p><u>Intelligence</u>: actionable intelligence is generated using the practices of sensemaking and learning to provide useful input for decision-makers and foster transformations at scale, paired with transparent reporting on results.</p>
Actors	Mayors, government ministries, industry leaders, regional leaders, community leaders, and funders.
Modes	Top-down
Efforts required	Leadership/coordinators: Moderate to Significant Other participants: Significant

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Source of innovation and learning that can accelerate change. — Important inputs for policymakers. — Possibility to develop bold new visions and bring them to life in real-world settings. 	<ul style="list-style-type: none"> — Need for strong and lasting commitment under volatile political cycles. — Significant resources across stages. — The process favouring the inclusion of high-ambition and high-impact actors might limit the replicability and relevance of the results in other contexts.

Case: EIT Climate-KIC Deep Demonstrations

EIT Climate-KIC uses the approach as the orchestrator of systems innovation. It previously supported a cohort of 15 European city governments through the Deep Demonstrations Healthy Clean Cities Programme. Building on this programme, EIC Climate-KIC coordinates the NetZeroCities, part of Horizon 2020 that contributes European Green Deal and the EU’s mission of 100 Climate-Neutral and Smart Cities by 2030.

Learn more

EIT Climate-KIC (2021). Deep demonstrations methodology: <https://www.climate-kic.org/wp-content/uploads/2021/10/Deep-Demonstrations-Methodology.pdf>

Transforming value chains

Why	Emission-heavy sectors and lock-ins constrain rapid decarbonisation. This can be addressed by bringing together actors across the value chain to shift away from established business models and define the new normal.
Description	Transformation of value chains happens through the deep and lasting engagement of diverse actors with significant control over long-term strategic priorities within the policy and business ecosystems. This includes scaling new business models, industrial symbioses, and integrated sustainable production systems.
Actors	Actors across the value chain, particularly industry leaders and associations, and policymakers. The transformation processes may encompass efforts to build end-to-end transparency and better mitigate possible negative impacts.
Modes	Top-down / Hybrid
Efforts required	Significant

<i>Benefits</i>	<i>Challenges</i>
<ul style="list-style-type: none"> — Industry actors that could potentially resist change become part of it 	<ul style="list-style-type: none"> — Industry actors that could potentially resist change become part of it — It may be hard to achieve the necessary level of commitment

- Possibility of developing more resilient and sustainable supply chains
- Companies can improve their ESG performance

- Value chain transformations require long-term investments, and thus undesirable lock-ins may occur at any point

Case: A.SPIRE for Processes4Planet

A.SPIRE represents innovative process industries, 20% of the total European manufacturing sector in employment and turnover, and more than 180 industrial and research process stakeholders and multiple sectors across more than 20 countries spread throughout Europe. A.SPIRE aims to foster the development of enabling technologies and best practices across all the stages of value chain productions for a more resource efficient process industry.

<https://www.aspire2050.eu/aspire/the-association>

Case: Zero-emission Waterborne Transport

Major ship-owning companies joined the partnership to facilitate the transition towards zero-emission waterborne transport. This reinforced cooperation can help tailor technologies to user needs and facilitate faster roll-out and scaling.

<https://www.waterborne.eu/partnership/partnership>

Learn more

World Economic Forum (2022). Taking big leaps in value chain resilience: adaptation and transformation <https://www.weforum.org/agenda/2022/09/taking-big-leaps-in-value-chain-resilience-adaptation-and-transformation/>

Mac Clay, P., & Sellare, J. (2022). Value chain transformations in the transition to a sustainable bioeconomy. ZEF–Discussion Papers on Development Policy, (319), 34.

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