Clean Hydrogen Partnership

SYNERGIES STRATEGY

2026 and beyond

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Executive Summary

The Synergies Strategy of the Clean Hydrogen Joint Undertaking (Clean Hydrogen JU) sets out a strategic framework to strengthen and streamline collaboration between the JU and complementary European, national, and regional initiatives. It aims to maximise the impact of JU's actions under the Multiannual Financial Framework (MFF) 2021–2027 and prepare the ground for sustained cooperation beyond it. The strategy supports the JU's mission to accelerate the development and deployment of hydrogen technologies by fostering coherence across policies, actors and funding instruments, contributing to Europe's hydrogen transition.

The Strategy builds on an extensive analytical and consultative process undertaken by the project consortium in close cooperation with the JU. The work combined comprehensive desk research—covering Clean Hydrogen JU public documents and internal notes, as well as public documents from other Horizon Europe Partnerships, Commission agencies, other EU and international initiatives—with targeted stakeholder engagement. The latter included two online surveys (one addressed to members of the States Representatives Group (SRG) and Stakeholders Group (SG), and another to selected Hydrogen Valley and flagship projects), as well as a series of online interviews and written questionnaires with internal and external stakeholders (10 interviews and 15 written questionnaires). This mixed-methods approach ensured a robust evidence base for identifying lessons, needs, and opportunities to strengthen synergies.

The analysis revealed that the Clean Hydrogen JU already operates within a rich network of synergies, notably through joint activities with other European partnerships and EU and international initiatives, as well as ongoing cooperation with national and regional authorities. However, it also identified fragmentation in coordination practices, uneven alignment between JU-funded activities and EU, regional or national funding frameworks, and limited monitoring of synergy impacts. The lessons learned highlight the need for more structured governance, systematic monitoring, and improved cross-programme communication to ensure coherence and maximise impact.

In response, the Strategy sets out **eight strategic priorities** to operationalise a more structured and integrated synergy ecosystem:

1. **Monitor and evaluate** the evolving synergy landscape through a continuous tracking and assessment framework.
2. **Establish a two-tier coordination system** distinguishing programmatic and operational cooperation levels.
3. **Scale up partnership models** using flexible frameworks inspired by existing JU-JU cooperation agreements.

4. **Institutionalise synergy governance and tools**, including digital information hubs, dashboards, and common templates.
5. **Strengthen multi-level coordination** with national and regional partners via joint funder boards and structured dialogues.
6. **Build upstream intelligence and regulatory coherence** by aligning R&I, deployment, and policy design cycles.
7. **Deepen vertical innovation pipelines and cross-partnership integration**, linking research, demonstration, and scale-up activities.
8. **Expand international alignment and global learning** through coordinated monitoring and co-funding with initiatives such as CHM and IPHE.

Together, these priorities provide the Clean Hydrogen JU with a **coherent**, future-oriented framework to strategically and proactively manage and steer its synergy activities. The Strategy strengthens the JU's capacity to act as a **strategic interface** between research, innovation, and deployment; ensures **greater efficiency and coordination** across its portfolio; and embeds **synergies as an integral part of the JU's governance and planning processes**. By institutionalising synergy management, the JU will be better positioned to **anticipate emerging opportunities, adapt to evolving EU priorities, and shape the next phase of the hydrogen agenda**. In doing so, the JU consolidates its role as a central enabler of Europe's hydrogen transition—one capable of aligning diverse funding instruments, policies, and actors towards shared objectives.

1 Introduction

1.1 Objectives and scope of the strategy

The **Synergies Strategy** of the Clean Hydrogen JU aims to provide a coherent, evidence-based and forward-looking framework for identifying, prioritising, and managing synergies that maximise the impact of JU's activities during the current Multiannual Financial Framework (MFF 2021–2027) and beyond, while also setting out concrete actions and operational pathways to put this framework into practice. It serves both as a strategic guide and an implementation-oriented roadmap, ensuring that JU's synergies activities are systematically planned, translated into tangible initiatives, and monitored for impact. Its overarching objective is to support the Clean Hydrogen JU in aligning its research and innovation (R&I) portfolio, governance processes and external collaborations with the broader European hydrogen ecosystem—ensuring policy coherence, resource efficiency, and long-term strategic relevance. In particular, the Strategy seeks to:

- **Define clear strategic objectives and guiding principles** for developing and maintaining synergies across programmatic, implementation and institutional levels.
- **Operationalise coordination mechanisms** with key stakeholders such as Horizon Europe (HE) European Partnerships, EU bodies managing and implementing complementary programmes and funds, EU (non-funding) initiatives, Member States, and regional and national Managing Authorities (MAs), including through co-funding and co-programming approaches.
- **Facilitate structured collaboration** with complementary funding streams (e.g. Innovation Fund, CEF, ERDF, RRF) to bridge the gap between R&I and deployment.
- **Reinforce governance, monitoring, and communication processes** to ensure synergies are systematically planned, implemented, tracked and assessed.

The Strategy covers all types of synergies relevant to Clean Hydrogen JU's mission—**programmatic** and **implementation-level**, including **co-funding synergies**—and extends across the full hydrogen value chain as defined in the **Strategic Research and Innovation Agenda** (**SRIA) 2021–2027**. It thus supports activities under all **SRIA pillars** (Renewable Hydrogen Production, Hydrogen Storage and Distribution, and Hydrogen End Uses as well as Cross-cutting Issues, Hydrogen Valleys, Hydrogen Supply Chains, and Strategic Research Challenges).

Importantly, this document establishes a **flexible and adaptive approach** that allows the Clean Hydrogen JU to **prioritise and recalibrate its synergies activities** as EU policy priorities evolve and as the post-2027 Multiannual Financial Framework (2028–2034) takes shape. **Looking ahead, it also proposes a set of "by-design" elements and recommendations that a potential future Clean**

Hydrogen JU could integrate into its governance and programming architecture to better enable the realisation of synergies in the next framework period. These forward-looking considerations extend beyond the programming and implementation synergies addressed in the current MFF, offering insights on how the institutional and operational design of a future Clean Hydrogen JU could further enhance systemic coordination, funding complementarity, and impact. The Strategy thus serves not only as a guide for current action but also as a living framework that can evolve in response to emerging opportunities, technological advances, and changing policy landscapes.

1.2 Key terms and working definitions

It is important to define some key terms used throughout this document.

- **Synergy**: in the context of EU Joint Undertakings (JUs) and the Single Basic Act (SBA), synergy means the *coordinated, complementary and sequential use of EU, national, and regional programmes* to maximise the impact of research, innovation, and deployment — ensuring policy coherence and efficient use of public funding.
- **Synergy area**: a group of organisations, initiatives, or counterparties that demonstrate alignment or complementarity across one or more dimensions — such as their type (e.g. R&I programme, funding instrument, policy platform), thematic focus, geographical scope, or operational nature. These entities share common or converging objectives and create potential for coordination or mutual reinforcement, whether through joint activities, policy coherence, shared funding streams, or strategic alignment at the EU, national, or regional level.
- **Synergy gap**: difference between the current level of synergy and the potential level of synergy between two organisations, initiatives, or funding programmes (see section 2.3).
- **Synergy dimensions**: an analytical category or aspect used to assess the nature, depth, and quality of interaction between the Clean Hydrogen JU and other organisations, initiatives, or funding programmes. Each dimension captures a distinct facet of synergy, such as policy, funding, or knowledge, and together they provide a structured way to evaluate complementarity, coherence, and potential alignment across actors (see section 2.3).
- **Managing Authority (MA)**: A Managing Authority is a national, regional, or local public or private body responsible for managing and implementing an operational programme approved by an EU Member State or a country associated with Horizon Europe. In the context of the Clean Hydrogen JU, the term also covers authorities that include hydrogen-related actions in their programmes, even if they are not formally designated as Managing Authorities under EU Cohesion Policy[1].
- **Hydrogen Valley**: They are integrated hydrogen ecosystems within a defined geographic area — from local or regional clusters (e.g., industrial zones, ports, airports) to national or cross-border regions (e.g., cross-border hydrogen corridors). They demonstrate hydrogen's versatility by linking production, storage, and distribution with multiple end-uses across sectors such as mobility, industry, and energy. Within these ecosystems, diverse applications share common hydrogen infrastructure, covering several stages of the hydrogen value chain, ranging from hydrogen to the subsequent storage of hydrogen and distribution to off takers.

[1] This broader interpretation allows the CHP to engage with regional and national actors that play a strategic role in funding and implementing hydrogen initiatives, thereby fostering stronger synergies between EU, national, and regional investment frameworks.

- **Flagship project**: A flagship project is a large-scale, strategic initiative supported by the Clean Hydrogen JU that involves key industrial and research partners to demonstrate, commercialise, and scale up hydrogen technologies. Aligned with the JU's Strategic Research and Innovation Agenda (SRIA) and building on previous EU-funded efforts, these projects are expected to have a significant impact on accelerating the transition to a hydrogen economy, serving as catalysts for the deployment and market uptake of hydrogen technologies in Europe.

2 The synergy landscape

2.1 The Clean Hydrogen JU's role within HE and the broader EU R&I ecosystem

The Clean Hydrogen Joint Undertaking is a central instrument in the European Union's research and innovation landscape for clean energy. Established as an institutionalised European Partnership under Article 187 TFEU, it implements part of Horizon Europe's Cluster 5 (Climate, Energy and Mobility). The JU brings together the European Commission, Hydrogen Europe, and Hydrogen Europe Research in a long-term public-private collaboration to advance hydrogen technologies and support the Union's climate-neutrality objectives.

The Clean Hydrogen JU is supported by two key advisory bodies: the States Representatives Group (SRG) and the Stakeholders' Group (SG). These bodies provide complementary perspectives — the SRG offering a policy and coordination lens from Member States and associated countries, and the SG ensuring the active involvement of stakeholders (including industry, research and other relevant European partnerships) across the hydrogen value chain. Together, they enhance the transparency, coherence, and impact of the JU's work in driving Europe's clean hydrogen transition.

The JU operates based on its SRIA, which defines the priorities for hydrogen production, distribution, storage, and end-use. Through this agenda, the JU translates Horizon Europe's strategic orientations into a targeted portfolio of projects that address technological, industrial and societal challenges along the hydrogen value chain. With a combined budget of approximately €2 billion for 2021-2027, equally financed by the Union and by private members, the Clean Hydrogen JU represents one of the largest dedicated R&I programmes under Horizon Europe.

According to the Single Basic Act[2], the Clean Hydrogen JU's overall priorities are:

1. **Contribute to the EU's ambitious 2030 and 2050 climate ambition**
2. **Support the implementation of the Commission's Hydrogen Strategy**
3. **Strengthen the competitiveness of the Union's clean hydrogen value chain**
4. **Stimulate research and innovation on clean hydrogen production, distribution, storage and end-use applications**

The aim is to bridge the gap between fundamental research and market-oriented deployment of Hydrogen technologies. The Clean Hydrogen JU supports activities typically ranging from

[2] https://eur-lex.europa.eu/eli/reg/2021/2085/oj

Technology Readiness Level (TRL) 4 to 8, complementing lower-TRL research funded through the European Research Council (ERC), the European Innovation Council (EIC), and the European Energy Research Alliance (EERA). Projects under the Clean Hydrogen JU develop and validate components and systems for electrolysers, fuel cells, hydrogen storage, and end-use applications in industry and transport. This intermediate position allows the JU to de-risk technologies and to prepare them for larger-scale deployment through other EU and national instruments.

Within Horizon Europe, the Clean Hydrogen JU cooperates with other European Partnerships such as Clean Aviation, 2Zero, ZEWT and EURAMET. These collaborations align research agendas and support the integration of hydrogen solutions across industrial and transport sectors. The JU's activities also contribute to the EU industrial policy priorities under the Net-Zero Industry Act (NZIA) and the Strategic Technologies for Europe Platform (STEP)[3] by fostering a competitive European hydrogen manufacturing base and strengthening technological sovereignty.

Beyond Horizon Europe, the Clean Hydrogen JU forms part of the broader EU research and funding ecosystem. It promotes synergies with complementary instruments, including the Innovation Fund, the Connecting Europe Facility (Energy and Transport), the European Regional Development Fund (ERDF), and the Recovery and Resilience Facility (RRF). Such coordination enables multi-source financing for large demonstration projects and accelerates the transition from R&I to market deployment. The Clean Hydrogen JU also supports the implementation of the Strategic Energy Technology (SET) Plan and contributes to the European Clean Hydrogen Alliance, supporting the objective of feeding research outcomes into industrial investment pipelines.

A flagship element of JU's work is the development of the Hydrogen Valley concept. This has been an effective way to concretely work together with national and regional authorities including – but not limited to– Member States and regional Managing Authorities. Hydrogen Valleys include production, storage, distribution and end-use applications at a regional or cross-border level, fostering territorial innovation ecosystems, promoting regional cohesion and the systemic integration of hydrogen in local energy systems. The JU also acts as a knowledge and policy interface, providing monitoring, impact analysis, and evidence to support the design of EU hydrogen policies, standards, and regulations.

The Clean Hydrogen JU's reach extends beyond the European Union. It engages with international partners and organisations such as NEDO (Japan), Mission Innovation, the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE), and the IEA Hydrogen Technology Collaboration Programme. These collaborations facilitate the exchange of best practices, joint standardisation efforts, and reciprocal access to testing and demonstration infrastructures. Within Europe, JU's

[3] Starting with calls launched in 2025, the Clean Hydrogen JU awards STEP Seals for selected innovation actions

industry and research members — Hydrogen Europe and Hydrogen Europe Research — serve as key multipliers, ensuring broad stakeholder participation and international visibility.

2.2 Synergy areas and mapping

The SBA requires all JUs under Horizon Europe to "*seek and maximise synergies with and, where appropriate, possibilities for further funding from relevant activities at Union, national and regional level*".[4] This is to foster collaboration across different areas, such as research and redeployment, by identifying and implementing programming and operational synergies with other EU programmes and collaborating with Horizon Europe stakeholders (e.g. with other partnerships/joint undertakings, Member States, industry or research organisations). The identification of operational synergies is also intended to avoid duplication of funding and research efforts and to reinforce the effects of EU investment.

Table 1 presents the full list of stakeholders identified. It includes an indication of the *Influence / Interest* of each counterpart, adapted from the EC's communication toolkit:

- the level of interest a stakeholder group has in the Clean Hydrogen JU
- the level of influence a stakeholder group has on the Clean Hydrogen JU.

A subset of these, considered as priority, is then analysed in more detail in the rest of this section.

[4] COUNCIL REGULATION (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe https://eur-lex.europa.eu/eli/reg/2021/2085/oj/eng, Art. 5(2)c

Table 1: Classification and main characteristics of all potential stakeholders

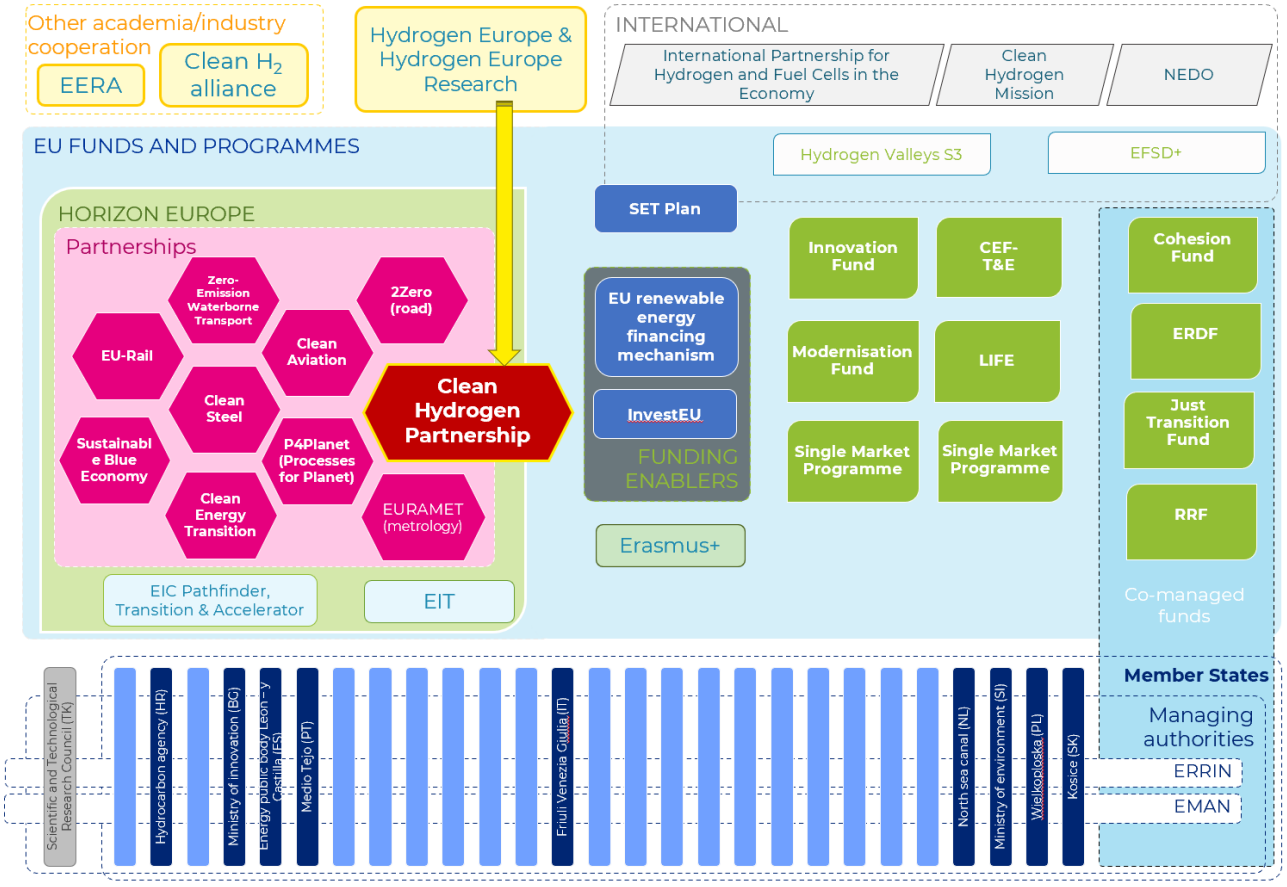
Stakeholder / Programme / Initiative	Level	Main focus / Description	Influence	Interest	Relevant stakeholders
Clean Hydrogen JU's Programme Office	Internal	Core operational unit of the JU providing institutional, operational and data insight on internal synergies, workflows and project management.	High	High	Head of Operations, Synergies Officer, Project Officers, Stakeholder Relationships Officer, Knowledge Management Officer, Communications Officers
Clean Hydrogen JU's advisory and governing bodies	National / Regional/EU-level	Represent national and stakeholder-level hydrogen strategies; align top-down and bottom-up synergies and validate strategic Direction.	High	High	States Representatives Group (SRG); Stakeholders Group (SG), Governing Board (GB)
EU institutions (incl. Executive Agencies)	EU-level	Manage or implement EU programmes supporting hydrogen R&I and deployment, including Horizon Europe, Innovation Fund, and CEF.	High	Medium–High	DG RTD; DG REGIO; DG GROW; DG ENER; DG MOVE; DG CLIMA; DG MARE; DG ENVI; DG INTPA; DG ECFIN; DG NEAR; SG REFORM; CINEA; EISMEA; REA; ERCEA; STEP Task Force; EIB; EHDEA
Other European Partnerships and Joint Undertakings	EU-level	Facilitate horizontal and sectoral synergies with the Clean Hydrogen JU.	Medium–High	Medium–High	Clean Aviation JU; EU-Rail; CBE JU; SESAR 3 JU; 2ZERO; ZEWT; P4P; Clean Steel; BEPA; Batt4EU; EIT InnoEnergy; EIT Climate; EIT Water; EIT Urban Mobility, CET Partnership; EURAMET; SBEP; EIC/EERA
EU level funding programmes (and funding enablers)	EU-level	Main EU funding streams supporting hydrogen R&I and deployment. Funds are allocated at EU level	High	Medium	Innovation Fund & Hydrogen Bank — Supports hydrogen production & use. EUR 2 billion auction active. Connecting Europe Facility (Energy & Transport) — Funds hydrogen transport & infrastructure under TEN-E & TEN-T.

Stakeholder / Programme / Initiative	Level	Main focus / Description	Influence	Interest	Relevant stakeholders	
					LIFE Clean Energy Transition	Funds early hydrogen pilots and clean energy actions.[5]
					InvestEU	Provides guarantees and loans for hydrogen infrastructure via EIB.
National and regional level funding programmes	National / Regional	Main EU funding streams supporting hydrogen R&I and deployment. Funds allocated at national and subnational level, sometimes in combination with national funds	High	Medium	Recovery and Resilience Facility (RRF)	National plans fund hydrogen valleys, infrastructure and industry pilots.
					IPCEI Hydrogen (Hy2Tech, Hy2Use, Hy2Infra, Hy2Move)	Supports large-scale cross-border hydrogen innovation and infrastructure.
					Modernisation Fund	Supports hydrogen production in 10 lower-income MS via national calls.
					Just Transition Fund (JTF)	Funds hydrogen projects in coal regions as part of just transition.
					ERDF & Cohesion Fund	Regions support hydrogen innovation and infrastructure via Operational Programmes
					Interreg (ETC)	Funds cross-border hydrogen projects and knowledge sharing.
EU hydrogen diplomacy initiatives	International	Bilateral and multilateral partnerships supporting global hydrogen collaboration, diplomacy and investment dialogues.	Medium	Low	EU–U.S. Energy Council; EU–Africa Energy Partnership & Green Energy Initiative; EU–Latin America Renewable Hydrogen Collaboration; EU–China Energy Dialogue; EU–India Clean Energy and Climate Partnership; EU–ASEAN Energy Dialogue; EU–Japan Green Alliance (MoC with NEDO); Just	

5 https://cinea.ec.europa.eu/programmes/life/clean-energy-transition_en

Stakeholder / Programme / Initiative	Level	Main focus / Description	Influence	Interest	Relevant stakeholders
					Energy Transition Partnership with Vietnam; EU–Algeria Strategic Energy Partnership; EU–Morocco Green Partnership; EU–Egypt Strategic and Comprehensive Partnership; EU–Tunisia Strategic Global Partnership; Eastern Partnership; EU–Norway Green Alliance; EU–Canada Green Alliance
International stakeholders and cooperation platforms	National	Organisations and initiatives supporting global hydrogen collaboration, benchmarking and best-practice sharing.	Medium	Medium	IRENA; IEA; Hydrogen Council; IPHE; Clean Hydrogen Mission; the International Partnership for Hydrogen and Fuel Cells in the Economy; the Clean Energy Ministerial; Energy Community
Hydrogen sector Representatives	International	Represent the private and research hydrogen community.	Medium	High	Hydrogen Europe; Hydrogen Europe Research; Clean Hydrogen Alliance; Alliance for Zero-Emission Aviation
Flagship Projects (incl. Hydrogen Valleys)	National / Regional	Coordinators and partners in JU-funded Innovation Actions (e.g. Hydrogen Valleys) offering bottom-up insight and funding lessons.	Low–Medium	High	JU project coordinators and partners; European Hydrogen Valley S3 Partnership
National and Regional Managing Authorities	EU level	Key partners with prior JU cooperation	Medium	Medium–High	10 MAs (TA); 15 MAs (PDA II); EMA Network; ERRIN

Figure 1: Synergies landscape



The JU operates within a broad system of European and international initiatives that share complementary objectives in research, innovation, and the deployment of clean energy technologies (see Figure 1: Synergies landscape). Within Horizon Europe, the Clean Hydrogen JU is one of the Institutionalised Partnerships (Joint Undertakings), and it is expected to work in close alignment with other partnerships. These include other JUs, Co-programmed Partnerships such as Clean Aviation and EU Rail, which are guided by strategic research agendas agreed with the Commission, and Co-funded Partnerships such as the Clean Energy Transition Partnership, which bring together EU and national resources in coordinated calls. Horizon Europe also provides important complementary instruments, notably the EIC Pathfinder and Accelerator for high-risk innovation, and the European Institute of Innovation and Technology (EIT), which strengthens entrepreneurial capacity and innovation ecosystems.

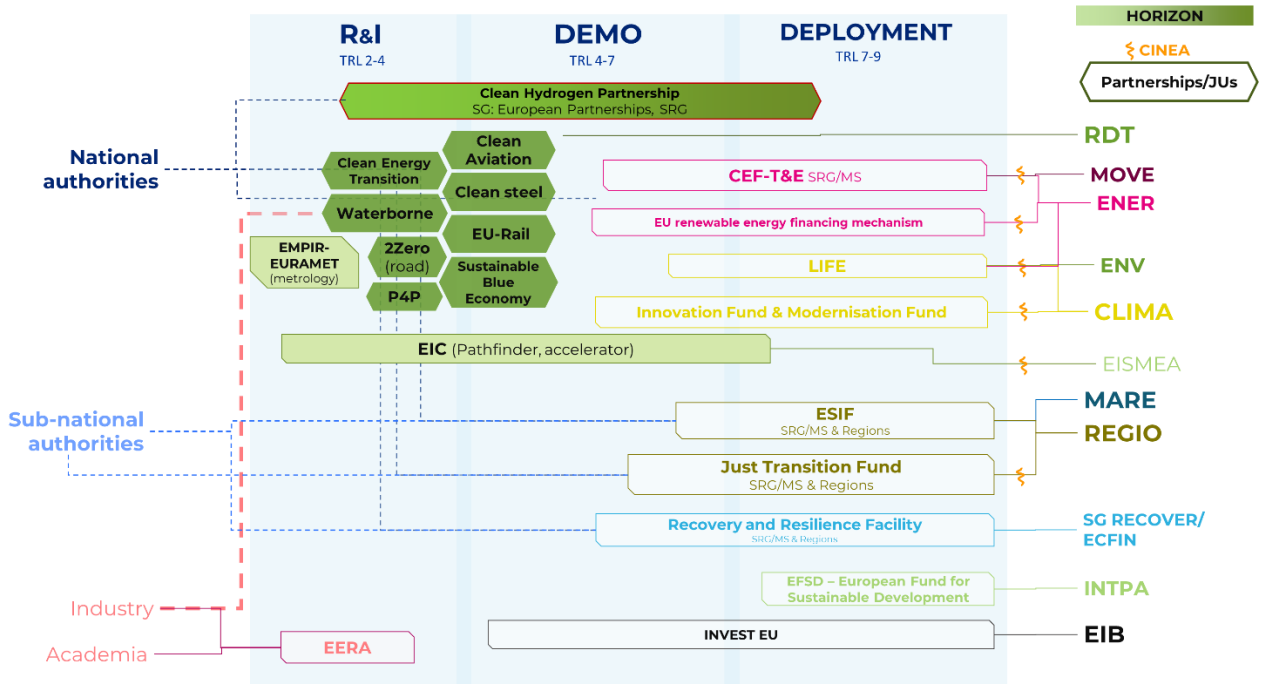
Beyond Horizon Europe, several EU programmes and funds create opportunities for synergy through policy alignment and complementary financing. Instruments such as the Innovation Fund and CEF support large-scale projects and infrastructure, while InvestEU acts as a financial enabler by mobilising private investment. At the same time, cohesion policy funds such as the ERDF and the

Cohesion Fund are co-managed with Member States and regional authorities, who play a central role in programming and implementation. This structure allows regional and national priorities to be combined with European objectives and creates direct opportunities for Clean Hydrogen JU results to be scaled up through territorial deployment.

International initiatives and non-EU managing authorities add another layer of cooperation, offering opportunities for policy coordination, joint projects, and knowledge sharing. Industry alliances and academic networks further reinforce this landscape by mobilising stakeholders and providing access to research infrastructure and expertise. Taken together, these actors and instruments offer a wide range of synergy potential with the Clean Hydrogen JU, based on their alignment in policy goals, funding mechanisms, and complementary areas of intervention.

The governance of hydrogen-related programmes involves a wide constellation of European Commission DGs, executive agencies, and external actors (see Figure 2).

Figure 2: Synergies by TRL and lead organisation[6]



DG RTD oversees the research agenda of Horizon Europe and its institutionalised, co-programmed, and co-funded partnerships. EISMEA implements the EIC Pathfinder, Transition, and Accelerator, while the European Institute of Innovation and Technology (EIT) manages KICs such as InnoEnergy that are active in hydrogen. Among executive agencies, CINEA plays a central role, implementing

[6] Note that other DGs and agencies are also involved in the management and/or implementation of these funds. The figure only includes the main D

major funding streams across energy and climate: CEF Energy and Transport (DG MOVE, DG ENER), LIFE (DG ENV, DG ENER), the Innovation Fund (DG CLIMA), and parts of the Just Transition Fund (DG REGIO). Cohesion Policy and ESIF instruments are overseen by DG REGIO, DG EMPL, DG MARE, and DG AGRI, but rely heavily on national and regional managing authorities for programming and delivery, making them crucial partners for the Clean Hydrogen JU. Funding enablers[7] are steered by DG ECFIN and the EIB Group (InvestEU), with external investment handled by DG INTPA through EFSD+. Coordination platforms such as the SET Plan and the Energy and Managing Authorities Network ensure policy alignment, while non-EU actors, including Clean Hydrogen Mission and IPHE, contribute international cooperation and industry perspectives. In parallel, EERA, ERRIN, RIMA[8], and Hydrogen Valley S3[9] provide research and regional stakeholder networks, reinforcing the multi-level governance in which Member States and regions act as decisive partners for scaling hydrogen deployment.

The initiatives relevant to the Clean Hydrogen JU can be differentiated by their positioning along the technology readiness level (TRL) chain. Horizon Europe partnerships such as Clean Steel, 2Zero, Clean Aviation, P4Planet, and Europe's Rail primarily target mid-TRL research and large-scale demonstration (TRL 4-7), complementing the JU's own focus on applied R&I. The EIC Pathfinder, Transition, and Accelerator extend the scope both upstream into low-TRL breakthrough research (TRL 1-4) and downstream into scale-up financing (TRL 7-9), while the EIT supports entrepreneurial activity and ecosystem integration across all TRLs. In contrast, Cohesion Policy instruments (ERDF, Cohesion Fund, ESF+, EMFAF, EAFRD) and the Recovery and Resilience Facility focus on deployment and market uptake (TRL 8-9), reflecting their mandate to support infrastructure, skills, and territorial development. Funds such as the Innovation Fund (ETS) and CEF Energy bridge demonstration and deployment, financing first-of-a-kind commercial projects and cross-border infrastructure. Finally, platforms like the Hydrogen Valley S3, and ERRIN (as well as other initiatives such as the SET Plan) provide coordination across TRLs, aligning research agendas with regional deployment priorities. Together, these initiatives form a continuum, where Clean Hydrogen JU results can flow from early-stage R&D through to large-scale market uptake.

In Figure 3, the organisations and initiatives are grouped by category and show their coverage across the five hydrogen value chain applications. Overlaps in applications are indicated with orange bars, which appear only where a high degree of overlap was identified. The analysis shows a relatively

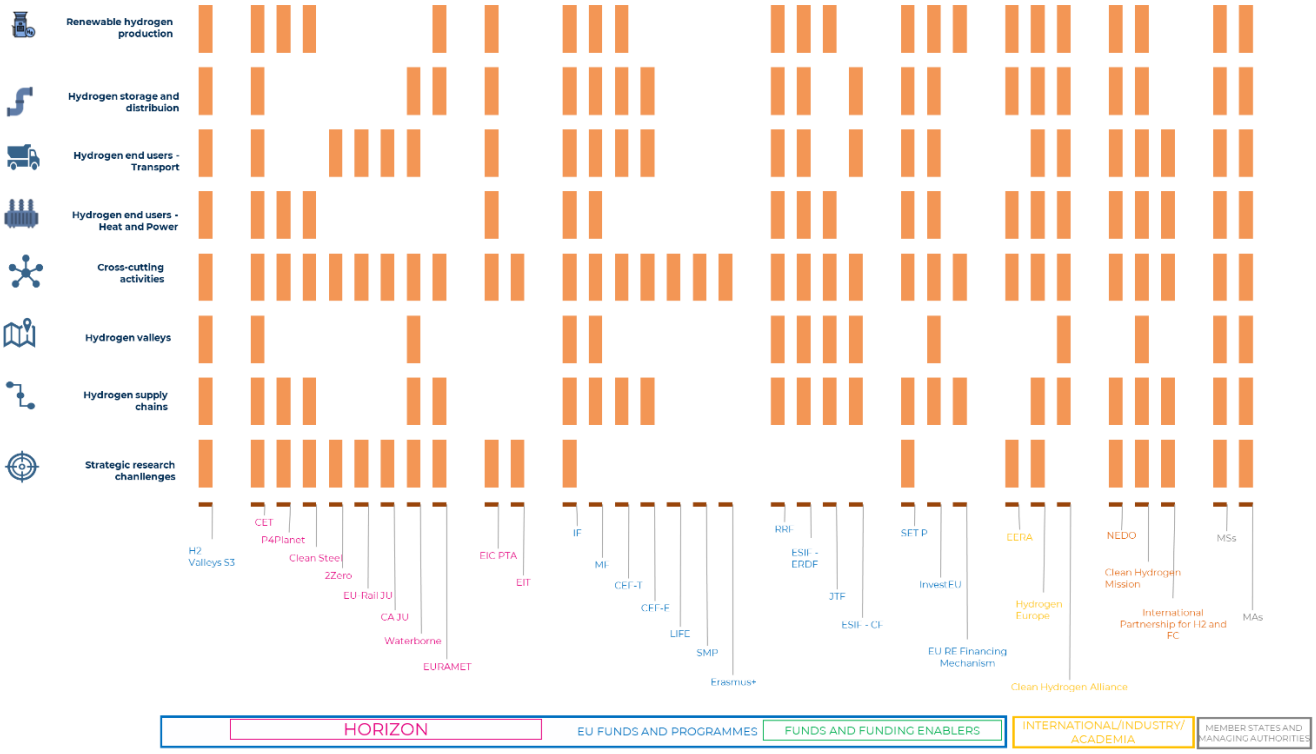
[7] In this context, financial enablers are EU instruments that do not primarily provide grants but enable investment through other financing channels. InvestEU supports projects via EU guarantees, loans, equity and advisory services, while the EU Renewable Energy Financing Mechanism facilitates renewable energy investments by pooling and channelling contributions from Member States (with limited EU co-funding).

[8] Research and Innovation network of Managing Authorities

[9] Note that the S3 Hydrogen Valleys is a strategic Partnership of the European Commission, which includes a regional/territorial network under the framework of the Smart Specialisation Strategy (S3) Community of Practice

even coverage across Production, Transport & Refuelling, Power Systems, Early Markets and Cross-cutting areas, with the latter being the more common pillar across synergies identified.

Figure 3: Synergy mapping across the Clean Hydrogen JU SRIA 2021-2027 pillars



2.3 Gap analysis of the Clean Hydrogen JU's existing and potential synergy activities

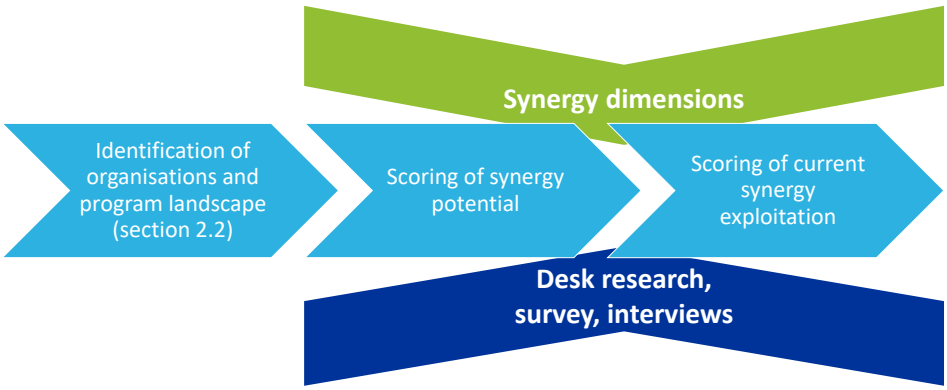
This section maps the current level of synergy exploitation and synergy potential between the Clean Hydrogen JU and several organisations and initiatives. This aims to support the JU in prioritising ongoing synergies and the synergy gaps which should be addressed, so to give an indication of which ongoing and missing synergies could potentially bring the highest leverage for the sector. The section provides a comparative, high-level overview of the synergy potential and gaps, with more details provided in synergy activities to date in section 3.2.

Synergy potential considers the JU and organisation/ programme objectives and activities separately and their theoretical complementarity – that is, regardless of any ongoing coordination, what is the potential to exploit complementarities between the two organisations. **Current synergy exploitation,** in contrast, refers to purposeful ongoing coordination activities between the JU and an

organisation/programme to exploit synergies across the dimensions. Having a formal agreement, such as an MoU, does not per se signifies a fully operational synergy unless also activities related to all the potential dimensions have been put in place.

To map the synergy potential and current synergy exploitation, the following steps were undertaken, as show in the scheme below (Figure 4).

Figure 4 Overview of approach to the gap analysis of the Clean Hydrogen JU's existing and potential synergy activities



Each existing and potential organisation or initiative has been evaluated across 9 synergy dimensions in relation to the Clean Hydrogen JU, as shown in Table 2 below.

Table 2: Dimensions employed for the gap analysis of synergy activities

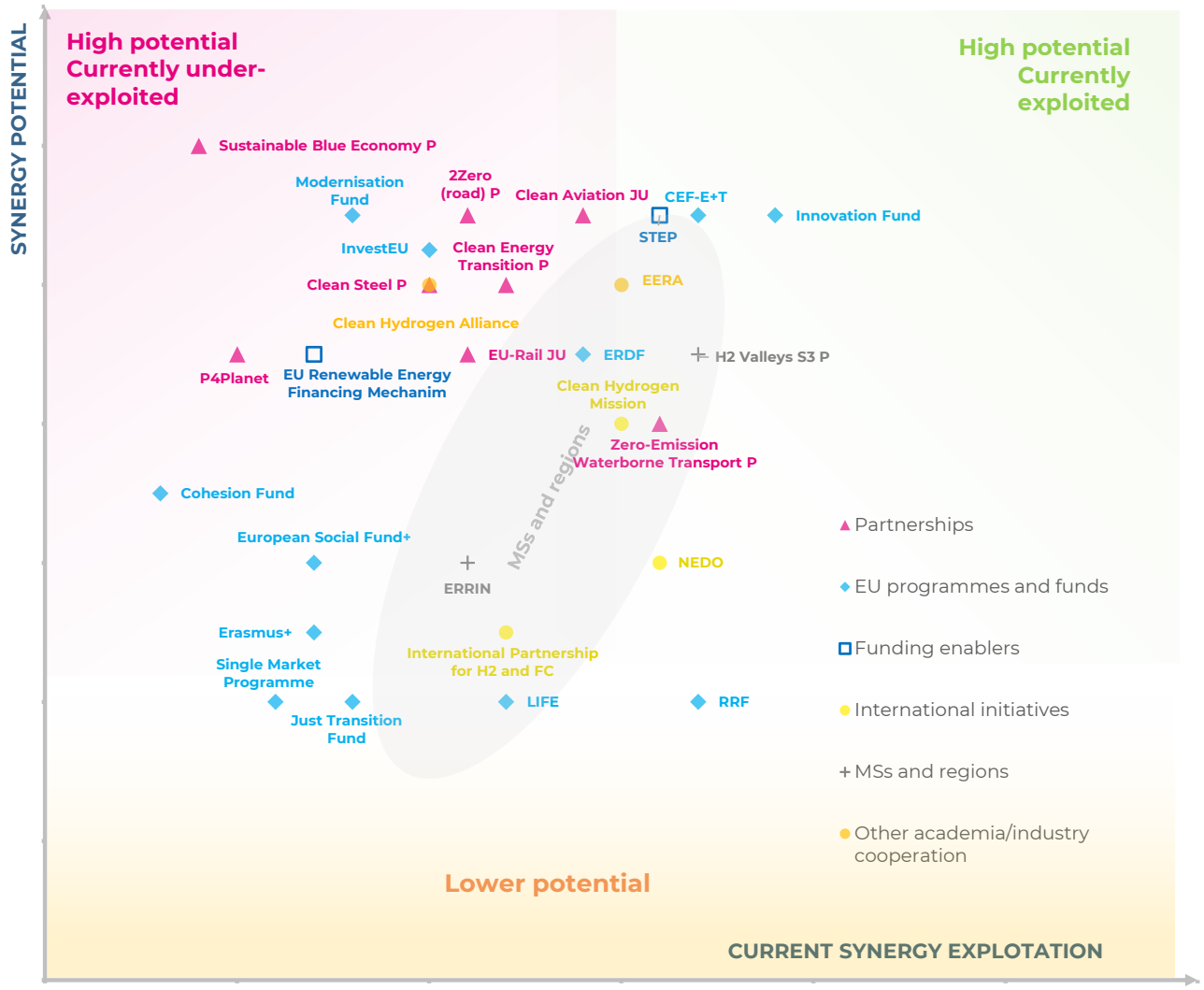
Synergy dimension	Description	Example of ongoing synergy
Policy alignment	Consistency of goals, strategies, and priorities	Commenting on counterpart's strategic/programming documents, and objectives are complementary by e.g. supporting projects along the TRL scale
Funding coordination	Alignment and integration of funding sources to maximise impact and avoid duplication	Joint calls are launched, or funding programmes finance complementary parts of flagship projects
Stakeholder engagement	Involvement and collaboration with relevant actors across sectors and governance levels	Joint participation in stakeholder engagement activities, e.g. through the Clean Hydrogen JU SRG
Research infrastructure	Access to and sharing of specialised facilities, equipment, and platforms for R&D	Organisations coordinate on programmes promoting access to hydrogen testing laboratories and other infrastructure
Innovation ecosystems	Networks enabling technology development, commercialisation, and market adoption	Organisations cooperate on JU's hydrogen valleys programme, providing feedback, data, and potentially co-funding to projects

Capacity building	Strengthening skills, capabilities, and resources to support effective participation and implementation	Joint training programmes are established, targeted towards authorities, project promoters, research organisations or other target groups related to JU's activities.
Knowledge management	Collection, organisation, and sharing of information, data, and best practices	Structured data exchange is agreed regarding project data, the hydrogen sector, case studies and others
Monitoring and evaluation	Tracking progress and assessing outcomes against objectives and indicators	Exchange of data required for monitoring exercises or provision of feedback to draft monitoring reports and evaluations.
Economic dimensions	Financial viability, cost-effectiveness, and economic impacts of collaboration	Joint investments in infrastructure projects are evaluated for return on investment and regional job creation.

The analysis can be visualised in a chart that presents the current level of synergies (horizontal axis) against the potential level of synergies (vertical axis) as show in Figure 5. To facilitate interpretation, the chart is split according to three high-level areas:

- **High-potential, currently under-exploited synergies:** The individual objectives and activities of the JU and the organisation/programme could be significantly aligned across several dimensions, but further purposeful coordination is necessary
- **High potential synergies already being exploited:** There are important potential synergies across several dimensions, and the JU is already coordinating with the respective organisation/programme
- **Lower potential for synergies:** The individual objectives and activities of the JU and the organisation/programme show limited potential for alignment, for example because hydrogen-related projects are not or only to a limited extent eligible for the specific funding programme. This does not mean there are no benefits of further coordination with the JU, but it does not constitute a strategic priority.

Figure 5: Current and potential synergy level



Overall, the analysis shows that:

- **Current synergy exploitation levels are generally modest** across most initiatives, even for core EU instruments like InvestEU and the RRF, with synergy potentials either limited in the first place or limited, purposeful coordination between the JU and the relevant organisations/programmes.
- **Only a few organisations and programmes are currently exploiting with the JU synergies with a high potential**, notably select funding programmes such as the **Innovation Fund and CEF, EERA and the Clean Hydrogen JU**, as well as **some regional authorities (e.g. Friuli Venezia Giulia)**, indicating active engagement via strategic frameworks in support of hydrogen R&I.

- **Cohesion and social funds (EAFRD, EMFAF, ESF+, ERDF, Cohesion Fund) show generally low synergy potential**, reflecting their traditional focus on broad regional or social objectives rather than hydrogen-specific activities, despite, e.g. mechanisms for increasing synergies between cohesion funding and Horizon Europe being foreseen in EU legislation.
- **Synergies with extra-EU organisations and initiatives** register **varying levels of potential and ongoing synergies**, for example, with the Clean Hydrogen Mission showing an important but not fully exploited potential, while synergies with NEDO are currently being exploited but are more limited given the geographical scope.
- **National and regional managing authorities vary significantly**: some (e.g. **EREN – Castilla-y-Leon, Wielkopolska, Kosice, Friuli Venezia Giulia**) already have **high or moderate current synergies** thanks to hydrogen pilot initiatives, while others remain **low**, reflecting early stages of cooperation and limited progress since Memoranda of Cooperation with the Clean Hydrogen JU were signed.

2.4 Synergy governance

The Clean Hydrogen JU manages synergies across governance, programmatic, and implementation levels to enhance the impact of EU and national investments in hydrogen technologies. The following analysis describes the JU's internal synergy management process, focusing on roles, coordination mechanisms, lessons learned, operational gaps, and recommendations for improvement.

2.4.1 Synergy management process

2.4.1.1 Roles and responsibilities

Governing Board (GB): It is the main decision-making body of the Clean Hydrogen JU, composed of the European Commission (DG RTD, DG ENER, DG MOVE), Hydrogen Europe, and Hydrogen Europe Research. It provides **strategic and operational oversight** and advises on thematic priorities, including those developed in synergy with other European Partnerships. While the Board does not design or manage synergies directly, it **endorses topics** that embed synergy objectives and reviews related updates through Programme Office reporting.

Executive Director (ED): He/She is the Clean Hydrogen JU's legal representative and overall head of the Programme Office. The ED provides strategic direction, supervises the implementation of synergy activities, and ensures coherence with the JU's Strategic Research and Innovation Agenda. Additionally, the Executive Director maintains regular dialogue with the States Representatives Group (SRG) and the Stakeholders' Group (SG), ensuring that stakeholder and national inputs are

effectively integrated into the JU's planning and reporting processes and translated into coordinated, complementary, and mutually reinforcing actions.

Programme Office (PO): It is composed of 29 members, organised into two main operational units — Finance and Administration and Operations and Communication — supported by an Internal Audit and Control function and an Assistant to the Executive Director and Heads of Unit, as shown in Figure 6. The Programme Office executes the JU's daily management, including all activities linked to synergy development and monitoring. Within the PO, synergy management involves both **strategic and operational actors**:

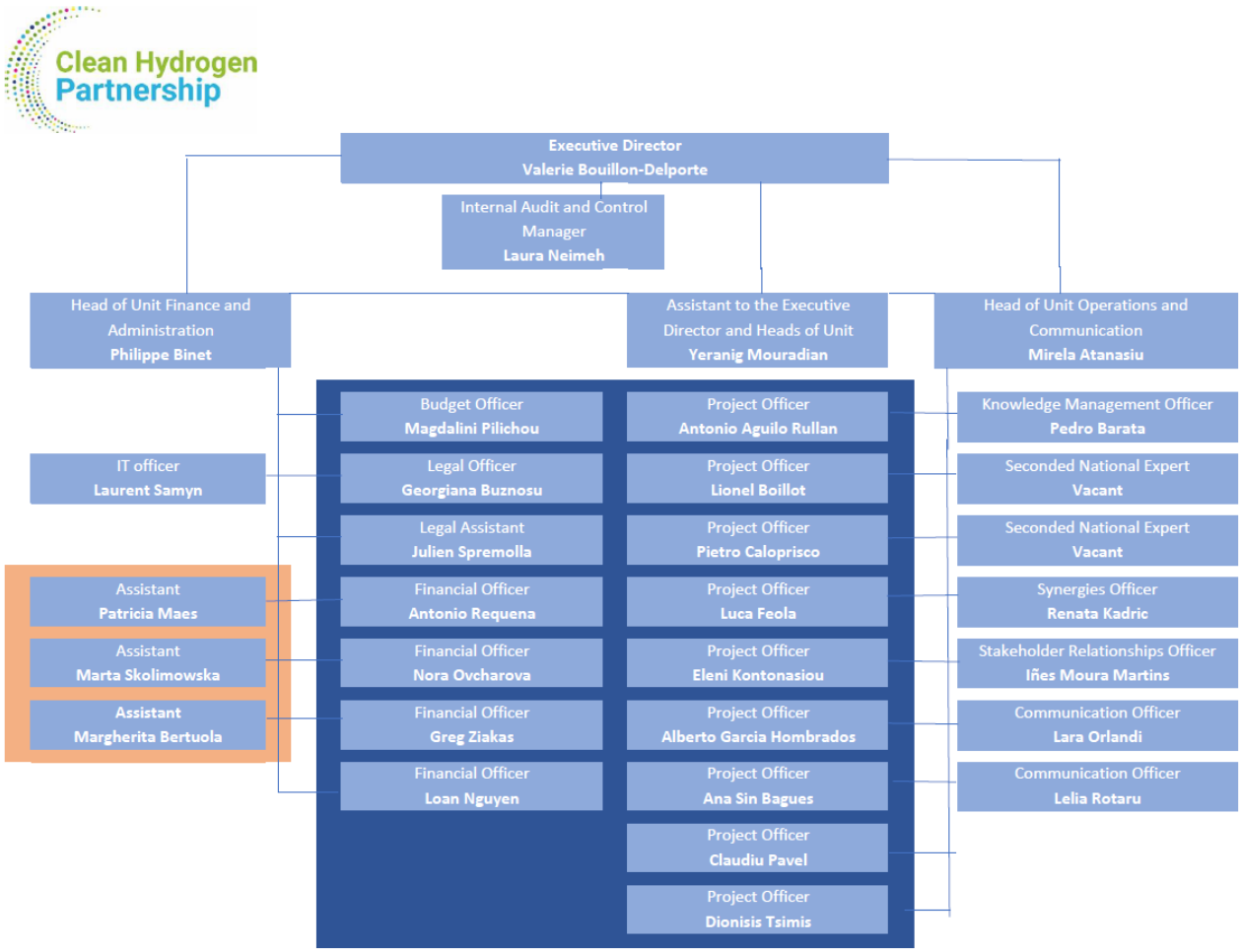
- **Head of Operations (HoO)** – provides oversight and ensures integration of synergy actions in planning and reporting cycles.
- **Synergies Officer (SO)** – coordinates synergy-specific initiatives, supports call topic alignment, tracks synergy-relevant projects, and manages liaison with all relevant synergy actors on the programming and implementation level.
- **Project Officers (POs)** – act as first-line synergy leads within their thematic portfolios, identifying, following, and reporting synergy opportunities with other Partnerships and JU-supported projects.
- **Knowledge Management Officer (KMO)** – enables data-driven synergies through shared repositories, dashboards, and observatories.
- **Stakeholder Relationship Officer (SRO)** – manages exchanges with SG, SRG, and national and regional Managing Authorities, ensuring information flows on synergy-related activities.

The Programme Office **initiates, coordinates, and implements** synergy activities under the ED's supervision. Activities range from the preparation of joint call topics to scanning external programmes for complementary projects.

States Representatives Group (SRG): It brings together representatives from all Member States and associated countries. It serves as "an observatory / information-exchange body" that provides **national-level intelligence**, identifies opportunities for co-funding or complementarity, and informs the JU about national hydrogen-related policies and initiatives. It provides advisory input on JU calls/AWPs design.

Stakeholders Group (SG): It represents industrial, research, and regional stakeholders at EU level. It meets twice a year to provide advice on call topics and emerging synergies. It acts as an intelligence and foresight channel, collecting signals from European Partnerships that are members of the SG.

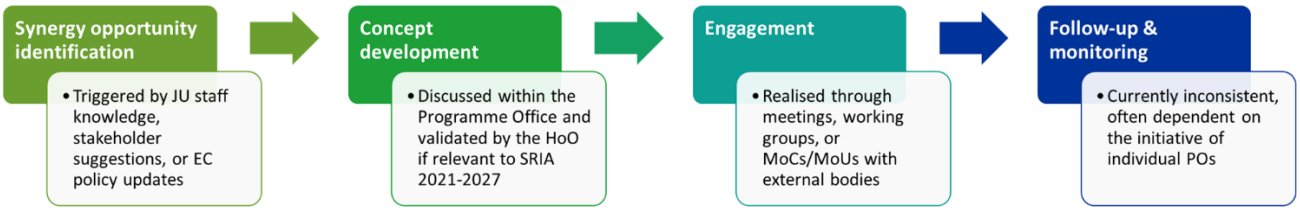
Figure 6: Programme Office Organisational chart



2.4.1.2 Internal workflow overview

In many cases, internal synergy workflow follows four informal stages as shown below:

Figure 7: Internal synergy workflow overview



While this process provides a useful structure for managing synergies, its implementation varies across synergy types. Formalised synergies, such as JU-funded Hydrogen Valleys implemented under Horizon Europe Grant Agreements, feature built-in feedback mechanisms through periodic reporting and key performance indicators covering hydrogen production, storage, distribution, and end-use. These structured loops ensure that results and lessons feed into future planning cycles. In contrast, other forms of cooperation—such as ad-hoc exchanges with external bodies or informal coordination with other Partnerships— lack systematic monitoring or documentation. Without an internal, consistent mechanism for capturing and reintegrating insights from all synergy activities, valuable learning from initiatives such as the MoCs with Managing Authorities or cross-JU collaborations risks remaining fragmented rather than informing programme-wide improvement.

2.4.1.3 Coordination mechanisms

Coordination within the Clean Hydrogen JU relies on **complementary formal and informal mechanisms** linking its internal governance, advisory structures, and external partners as shown in Figure 8. Together, these ensure consistent information flow, strategic alignment, and follow-up of synergy opportunities across programmes and institutions.

Internal coordination

- **Intra-Programme Office coordination:** Regular unit meetings under the Head of Operations allow POs to share synergy updates; the Synergies Officer monitors and consolidates inputs. Coordination between POs and the Synergies Officer remains largely informal, with reporting conducted verbally or by email.
- **Advisory body coordination**:
  SRG coordination: The States Representatives Group (SRG) consists of one representative of each Member State and of each country associated with the European Commission's Horizon Europe Programme. The Programme Office supports the coordination and

preparation of SRG meetings, held three times per year, and ensures regular communication with national representatives. It provides updates on programme implementation, call results, and policy developments, and facilitates SRG reporting on national and regional hydrogen policies and initiatives. The Programme Office also supports the consultation of the SRG on the JU's Annual Work Programmes and other strategic matters, ensuring that SRG inputs are systematically integrated into the JU's strategic planning, monitoring, and synergy activities.

SG coordination: The Stakeholders Group (SG) consists of representatives of industry sectors related to hydrogen, including representatives of other relevant European partnerships, and of the scientific community. The Programme Office supports the coordination and preparation of SG meetings, held three times per year, and ensures regular communication with stakeholders across the hydrogen value chain. It provides updates on JU activities, priorities, and call results, and gathers input on strategic, technological, and cross-sectoral issues relevant to its SRIA. The Programme Office also supports the consultation of the SG on the JU's Annual Work Programmes and other strategic matters, ensuring that stakeholder perspectives are systematically integrated into the JU's strategic planning, implementation, and synergy activities. Coordination with external partners

- **Executive Agencies – informal cooperation:** Periodic informal exchanges and ad-hoc meetings (as needed) with **CINEA, HADEA, and EISMEA** support horizon scanning, follow-up of externally funded hydrogen projects, and avoidance of duplication, especially after award results. However, as these agencies act under the delegated authority of their respective parent Directorates-General (DGs)[10], the scope and depth of cooperation are inherently limited. The agencies' role is primarily operational, while strategic and policy decisions remain under the competence of their parent DGs. As a result, coordination outcomes depend largely on the willingness and alignment of the parent DGs to promote structured cooperation across programmes. This underscores the need for JU to maintain parallel and complementary dialogue at the DG level to ensure that insights from informal agency exchanges translate into more strategic, cross-programme synergies.
- **HE European Partnerships:**

[10] CINEA operates under delegation from 7 DGs (DG MOVE, DG ENER, DG CLIMA, DG RTD, DG ENV, DG REGIO, DG MARE), managing synergies across various funding programmes such as LIFE, CEF, Horizon Europe (Cluster 5 and Missions), Innovation Fund, and EMFAF. EISMEA implements its mission in close cooperation with its 5 parent DGs (DG RTD, DG CONNECT, DG GROW, DG JUST, DG REGIO), managing synergies across various funding programmes such as Horizon Europe (EIC Programmes and European Innovation Ecosystems), Single Market Programme, ERDF (Interregional Innovation Investments Instrument) and Strategic Technologies for Europe Platform. HaDEA operates under the supervision of 6 parent DGs (DG SANTE, DG RTD, DG CNECT, DG GROW, DG DEFIS, HERA, managing synergies across various funding programmes such as EU4Health Programme, Horizon Europe (Clusters 1 and 4 as well as the EU Mission on Cancer), Digital Europe Programme, Connecting Europe Facility – Digital, Single Market Programme (Food Chain component)

- **Formal/institutionalised coordination**: With **Clean Aviation JU (CAJU)**, an **MoU** operationalises the SRIA "interface" (the Clean Hydrogen JU develops components; CAJU integrates them), supported by bi-monthly meetings and permissioned exchanges on drafts and project information. The two Joint Undertakings have also aligned their SRIAs, ensuring coherent R&I planning across the hydrogen and aviation domains. This structured coordination has already produced tangible outcomes — most notably, the launch of a €100 million CAJU call fully dedicated to hydrogen technologies. This milestone illustrates how formal cooperation frameworks between JUs can translate into concrete funding synergies, accelerating the uptake of hydrogen solutions in the aviation sector and showcasing the value of SRIA-level alignment as a model for cross-partnership coordination.
- **Advisory/embedded coordination and/or informal working-level coordination**: Other HE European Partnerships, such as ZEWTP, EU-Rail participate through their **membership in the SG**, ensuring coordination through established advisory channels. In addition, coordination with these partnerships occurs **informally at PO-to-PO level**, through regular exchanges on work programme planning, project follow-up, and emerging synergy opportunities. This complements the formal SG mechanism and supports ongoing technical alignment.
- **Informal ad-hoc coordination**: The JU also cooperates with other HE European Partnerships that are not SG members (e.g. CETP) on an ad-hoc basis. Interactions with these Partnerships are informal (through e-mail exchanges or occasional meetings).

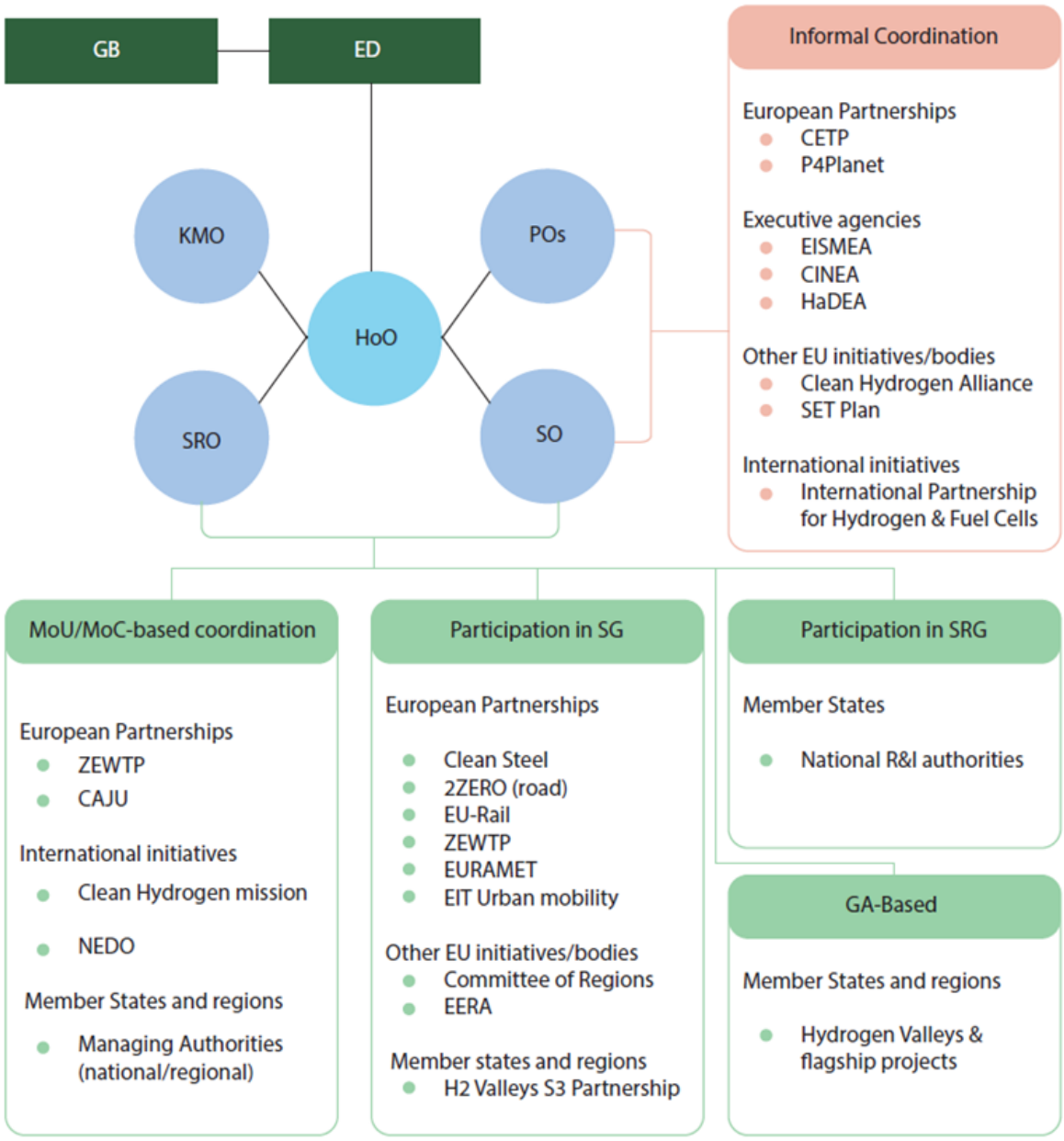
- **National/regional Managing Authorities (MAs) – Formal institutionalised coordination:** The JU uses **Memoranda of Cooperation** as **a formal coordination channel** with national/regional MAs to align Cohesion/RRF and JU R&I investments, enable co-funding models, and structure follow-up. Those MoCs function both **strategically** (policy alignment, shared plans) and **operationally** (joint meetings, capacity-building activities such as co-funding Hydrogen Valleys and knowledge-sharing), with governance structures ranging from inter-departmental WGs to ministerial coordination mechanisms. The JU contributes by providing best practices and guidance in areas such as proposal evaluation methods, expert selection recommendations, as well as by supporting MAs in strengthening their hydrogen-related governance and programme implementation. Regular liaison, call calendars/SRIA signals sharing, and state-aid/double-funding checks reinforce the coherence of these collaborations.
- **National R&I authorities – Advisory/embedded coordination**: The Clean Hydrogen JU coordinates with national and regional R&I authorities through its SRG. This structured

coordination mechanism enables synergies and complementarities between JU-funded actions and national or regional R&I policies and funding instruments.

- **Multi-partner consortia of Hydrogen Valleys and flagship projects – formalised, GA-based cooperation**: the Clean Hydrogen JU coordinates with the coordinators of Hydrogen Valleys and flagship projects through formal exchanges in the framework of the respective Grant Agreements signed with the Consortia partners. The JU also actively facilitates awareness and collaboration among projects working in similar areas (e.g. through portfolio presentations during kick-off meetings).

These mechanisms form a multi-layered governance network linking programme, advisory, and project functions, though many exchanges still depend on individual initiative rather than codified processes.

Figure 8: Mapping of the Clean Hydrogen JU's coordination ecosystem



To operationalise this multi-level coordination, the JU's **Annual Work Programmes (AWPs)** systematically **identify expected synergies** across the full landscape of relevant programmes and actors, including other European Partnerships, Commission services and executive agencies, as well as national and regional MAs. Flagship calls—such as Hydrogen Valleys—explicitly require applicants to build combined funding strategies across EU instruments (Innovation Fund, CEF, ERDF,

RRF), national programmes, private capital and financial institutions. The use of the Seal of Excellence and the STEP Seal further enables high-quality projects to seek support from cohesion policy and other complementary funding sources, making synergies a structured and recurring element of annual programming rather than an ad hoc activity.

2.4.2 Key lessons learned

Synergy central focal point enhances cross-unit coordination: The recently established Synergies Officer serves as a cross-unit focal point, strengthening horizontal coordination and ensuring coherence between strategic planning, operational implementation, and external engagement.

The SG & SRG reinforce Clean Hydrogen JU's legitimacy and strategic reach: The SG and the SRG have become central to the JU's reputation as a transparent and inclusive governance model. By linking industry foresight with national policy intelligence, they ensure that EU hydrogen priorities reflect both market realities and Member State trajectories. However, it should be noted that the ministries represented in the SRG are primarily research and innovation–focused and therefore may not always have direct mandates or full visibility over national programmes managed by other sectoral ministries, such as those responsible for energy, transport, or industry. This structural limitation can occasionally constrain the breadth of intelligence feeding into JU's strategic coordination. Structured dialogue channels nonetheless remain a key asset for early intelligence gathering, alignment of strategic agendas, and continuous feedback between policy and implementation, strengthening JU's capacity to steer Europe's hydrogen ecosystem with foresight and credibility.

The SRG report enhances transparency and coordination: The SRG annual reporting process has strengthened mutual awareness among Member States, giving the JU regular insight into national hydrogen policies, funding priorities, and regulatory progress. It has improved policy visibility and positioned the SRG as a conduit between national administrations and European-level programming. It has also fostered a culture of coordination and exchange, complementing formal SRG meetings and maintaining engagement between Member States and the JU throughout the year.

Structured collaboration with HE Partnerships delivers tangible value: The Clean Hydrogen JU-CAJU MoU increased trust, transparency, and efficiency—demonstrating that formal cooperation frameworks outperform ad-hoc exchanges.

MoCs with MAs consolidate EU-national-regional policy alignment and operational collaboration: The MoCs have emerged as effective instruments for translating EU hydrogen ambitions into coordinated national and regional action. They align R&I priorities across governance levels, elevate hydrogen on domestic agendas, and establish trusted, structured channels between the Clean Hydrogen JU and the MAs. The MoCs with the Ministry of Innovation of Bulgaria and with the ERDF and ESF+ MAs of the Friuli Venezia Giulia region demonstrate a dual function: strategically, they synchronise planning cycles and ensure that hydrogen priorities under the JU's SRIA are mirrored in national and regional programmes; operationally, they enable co-funding of concrete projects such as the ZAHYR Hydrogen Valley in Bulgaria and Hydrogen Hub Trieste in FVG, and facilitate technical exchanges, and regulatory guidance. They also encouraged stronger interdepartmental

coordination—Bulgaria linking policy and innovation directorates, FVG creating an Interdepartmental Hydrogen Working Group—anchoring hydrogen as a cross-cutting investment priority and mobilising resources across multiple EU, national and regional instruments. These cases show how the MoC model can be scaled as a practical mechanism for sustained cooperation, delivering both strategic alignment and concrete investment outcomes across diverse territorial contexts.

Knowledge management underpins evidence-based coordination: The Clean Hydrogen JU's Knowledge Management function provides the backbone for synergy monitoring and evidence-based coordination. Through close collaboration with the JRC, DG ENER, DG RTD, DG MOVE, DG CLIMA and DG GROW, it ensures consistent information flows and reporting, supported by data interfaces such as the Hydrogen Observatory and Knowledge Hub. Together with the JU's KPI system—which tracks progress across research, innovation, and deployment in line with Horizon Europe and Green Deal objectives—these tools enable data cross-referencing, shared visibility, and policy coherence. They function as "soft synergies," fostering interoperability and alignment across partnerships and Commission services.

Trust and personal relationships underpin coordination: Informal exchanges among POs and European Partnerships and Executive Agencies contacts often substitute for formal workflows—efficient in practice but person-dependent. However, these informal exchanges (without the involvement of the parent DGs to formalise the synergies between programmes) are limited when it comes to fostering more structural synergies among programmes or even the systematic obtention of information about the activities and projects funded by other programmes.

2.4.3 Structural and operational gaps in Clean Hydrogen JU's synergy management framework

Role clarity gap: Despite identified focal points, roles and responsibilities for synergy-related work remain insufficiently defined across Units. The Synergies Officer is responsible for overall coordination of synergy activities, but also manages individual projects, while Project Officers handle synergy actions within their own portfolios without a formalised reporting or decision-making structure. As a result, overlaps occur—such as parallel outreach to the same external partners or duplication in monitoring tasks—while some cross-unit activities fall between responsibilities. The absence of a clear allocation of responsibilities and decision-making lines leads to uneven ownership and inconsistent follow-up on synergy initiatives.

Limited codification of internal processes: Coordination largely relies on informal communication; no formal framework clarifying roles, accountability, and reporting procedures across units exists and no unified RACI Responsible, Accountable, Consulted, Informed) matrix or standardised reporting templates are in place.

SG & SRG consultations occur, but perceived timing limits strategic influence: Both advisory bodies are informed and consulted during the early stages of the Annual Work Programme preparation, including discussions on strategic priorities. However, SRG & SG members often perceive their involvement as coming too late to meaningfully influence decisions, partly because consultation typically follows internal scoping. This perception gap reflects a difference in expectations: while the JU views the SG and SRG as forums for structured feedback, members often expect a stronger facilitation and co-creation role. As a result, both groups tend to engage reactively rather than proactively, limiting their contribution to the early design of strategic priorities and calls.

Lack of visibility and structured feedback reduces engagement: Both SG & SRG are uncertain about how their recommendations are used. The absence of a formal feedback mechanism creates a sense of limited influence and discourages proactive contributions. This perception of low impact undermines continuity of engagement and weakens the link between consultation and decision-making.

Siloed information flows & advisory fragmentation: The SG and SRG operate largely in parallel despite clear complementarities. Without structured interaction, their inputs remain siloed, and opportunities to align industrial innovation needs with national regulatory and funding frameworks are lost. Occasional exchanges during formal meetings are insufficient to foster the cross-learning and mutual awareness that a coherent advisory system requires.

Uneven participation in the SG & SRG and variable commitment: Both groups face inconsistent levels of engagement among members. In the SG, participation depends on individual or organisational interest in specific topics; in the SRG, the variability stems from differences in Member States' administrative capacity and the seniority of national representatives. This results in an imbalanced representation, with a few active voices driving the dialogue and many members remaining passive observers. Clearer expectations and targeted internal capacity-building, such as briefings on JU processes, guidance on preparing inputs, peer exchanges on national and sectoral synergy practices, and structured feedback or thematic learning sessions would help both SG and SRG members engage more effectively and provide higher-quality, comparable contributions.

Untapped potential for the SRG report as a foresight instrument: The SRG annual report remains largely descriptive. Inputs differ in structure and depth across Member States, limiting comparability, synthesis, and the ability to extract strategic insights. Additionally, the report often arrives after AWP scoping, which limits its potential to shape work programmes. Furthermore, there is currently no structured process for acknowledging or responding to Member State inputs. Without visible follow-up, contributors lack clarity on how their reports influence Clean Hydrogen JU actions, which discourages forward-looking and detailed submissions. Insights gathered through the MoCs with Managing Authorities—covering co-funding experiences, regulatory challenges, and best practices—

are not yet incorporated into SRG reporting, resulting in fragmented policy intelligence and missed opportunities for coordination.

Limited leverage in inter-agency cooperation: Informal exchanges with executive agencies such as **CINEA** have limited impact, as these bodies operate under the authority of their parent DGs, which retain decision-making power on programme design and priorities. This structural dependency constrains access to timely project information and limits JU's ability to align with related programmes such as **CEF Energy** or the **Innovation Fund**, even when high-level meetings occur. The lack of formal coordination frameworks or shared data protocols caps the potential for deeper synergies, leaving the JU with little leverage to address these gaps beyond maintaining regular information exchanges and advocating for stronger cross-DG coordination.

MoCs with MAs remain unevenly formalised and disconnected from strategic feedback loops: Despite clear progress, the MoC framework remains unevenly formalised and insufficiently integrated into the Clean Hydrogen JU's strategic processes. The cooperation agreements set broad objectives without concrete annual or multiannual activity plans, making coordination ad hoc and difficult to track. Feedback and intelligence generated through implementation—such as co-funding results, timing mismatches, and regulatory challenges—are not yet systematically fed into the JU's programming cycle, limiting institutional learning. Differences in eligibility rules, state-aid interpretation, and reporting obligations between EU and national instruments also hinder seamless cooperation. Engagement levels vary widely across MAs, with stronger participation where political commitment and technical capacity are high, and slower progress where administrative resources are limited. Finally, the absence of a common peer-learning platform among MoC signatories prevents collective exchange, reducing opportunities to identify common challenges, harmonise approaches, and replicate effective practices across regions.

Synergy monitoring lacks structure, depth, and shared oversight: Current JU indicators capture co-funded projects but overlook the **quality, learning value, and policy impact** of those collaborations. No metrics track **knowledge sharing or interoperability**, key dimensions of non-funding synergies. The absence of a **shared tracking tool** prevents comprehensive oversight—management cannot easily monitor progress, identify good practices, or ensure coordination across units. Fragmented data collection, inconsistent templates, and diffuse responsibilities further reduce comparability and hinder a unified view of synergy performance.

Reactive approach. Many synergy initiatives are triggered by external requests or reporting needs rather than proactive strategic planning.

Resource constraints: Synergy coordination within the JU is constrained by limited human and administrative resources. The Synergies Officer combines this role with project management duties, leaving little capacity for systematic follow-up or process formalisation, while other staff contribute

to synergies only on an ad hoc basis. This dependence on individual initiative limits continuity, institutional learning, and the scaling-up of successful practices. The absence of a dedicated support structure or resource plan prevents synergy activities from evolving into a sustained, organisation-wide function.

2.4.4 Strategic implications and opportunities

Define and codify roles: Greater clarity on the respective contributions of the Programme Office, Executive Director, and advisory bodies could enhance coherence in the identification, coordination, and monitoring of synergies. A structured reference framework, such as a RACI matrix, could support this alignment.

Clarify and reinforce the Governing Board's strategic guidance role: While the GB holds overall responsibility for the JU's strategic orientation and the supervision of its activities, its contribution to the formulation of strategic priorities and synergy directions tends to be more supervisory than directive. GB deliberations often focus on approving the Annual Work Programme and monitoring implementation progress, with limited opportunity to influence emerging cross-cutting initiatives or inter-programme coordination. While the SRG already reports to the GB regarding national and regional hydrogen-related policies, these reports are often transmitted in their raw form, without synthesis or structured feedback on their use. Strengthening the GB's upstream role—through periodic briefings summarising SRG and SG intelligence, MoC progress, and cross-programme synergies—would enhance its ability to provide forward-looking guidance. Establishing a structured flow of strategic information to the GB —supported by concise executive briefs highlighting emerging national priorities from the SRG and sectoral stakeholder priorities from the SG, alongside co-funding prospects and regulatory challenges, and complemented by a short "You Said / We Did" feedback note– would help translate operational insights into long-term direction, making GB steering more anticipatory, coherent, and impact-driven.

Formalise internal workflows: A more systematised approach to synergy management through a Synergy Coordination Framework, defining process stages (intake → assessment → decision → follow-up), could be beneficial. This could be supported by concise documentation (e.g. one-page synergy briefs, action logs).

Institutionalise advisory feedback loops: Earlier and more structured engagement of the SG and SRG in the AWP cycle could improve the uptake of stakeholder perspectives. Summarised feedback ("You said / We did") and occasional joint sessions could help close the loop between consultation and decision-making.

Optimise the SRG annual report as a forward-looking programming tool: The SRG annual report could be repositioned as a forward-looking tool to inform strategic programming rather than a retrospective exercise. This could be achieved by:

- **Revising its structure to allow for greater clarity, comparability, and foresight**. Each national contribution should follow a concise, harmonised template that captures key policy priorities, co-funding cases, and planned initiatives linked to the SRIA pillars. Forward-looking sections should outline future funding outlooks (6-18 months), upcoming national call windows, hydrogen investment pipelines, and potential synergy areas with other EU or regional instruments. The inclusion of measurable synergy indicators or KPIs will make the report programmable, enabling consistent analysis across Member States and facilitating its integration into the Clean Hydrogen JU's strategic planning process.
- **Enhancing Feedback Loops and Strategic Visibility**. A clear feedback and visibility mechanism should be established to strengthen the connection between SRG intelligence and high-level decision-making. A 2–3-page executive brief should be prepared for the Governing Board, synthesising key trends, national funding pipelines, and cross-country insights emerging from SRG contributions. This brief could also be circulated to SG members to ensure transparency, promote shared understanding of strategic developments, and foster more informed dialogue between the JU's advisory bodies and governing structures.
- **Strengthen coordination and accountability**. SRG country focal points could be nominated for synergy and MoC follow-up, particularly in countries with signed or advanced MoCs. These focal points would sustain dialogue, ensure continuity between national reports and MA feedback, and maintain engagement throughout the year.
- **Integrating SRG and MA-MoC intelligence**: A dedicated section on the MoC progress of MAs could be included in the SRG report template. This should consolidate operational insights from MAs—on co-funding, regulatory alignment, and success cases—and be informed by biannual exchanges between the Clean Hydrogen JU and the MAs.

Strengthen the SRG's role in synergy intelligence: The SRG's role could evolve from that of a passive information provider to an active intelligence node within the Clean Hydrogen JU ecosystem. Beyond reporting national developments, the group could proactively identify opportunities for co-funding alignment, regulatory coherence, and strategic collaboration at national and regional levels. To support this shift, Member States should be encouraged to nominate senior representatives with policy or funding mandates, thereby enhancing the SRG's authority and capacity to act. Additionally, to ensure that national inputs reflect wider hydrogen-relevant policies, SRG representation should ideally include officials from the ministries or inter-ministerial liaison offices responsible for research and innovation, energy, transport, or industry, as appropriate to each national context. This approach would reinforce coherence and efficiency, ensuring that SRG inputs capture the key policy

perspectives most relevant to hydrogen. In parallel, the Programme Office should systematically connect SRG inputs with the outcomes of the MoCs signed with national and regional MAs. This would transform SRG exchanges into actionable intelligence, strengthening JU's ability to coordinate investment efforts and policy frameworks across governance levels.

Engage both advisory bodies earlier in the programming cycle: To transform consultations into meaningful co-creation, the JU should involve both the SG and SRG at the **pre-scoping stage** of the AWP. Early exchanges on draft orientations and emerging priorities would allow the JU to integrate industrial, research, and policy perspectives before decisions are finalised. A **predictable consultation calendar** shared at the start of each year would clarify when and how each body is expected to contribute.

Increase transparency and traceability of advisory input: The JU should introduce a clear feedback loop to demonstrate the use of SG and SRG inputs. After each consultation round, a concise "You Said / We Did" note could summarise which recommendations were integrated, deferred, or rejected, and why. This would strengthen trust, enhance accountability, and motivate members to provide more focused, evidence-based contributions.

Institutionalise joint SG–SRG coordination mechanisms: The Clean Hydrogen JU should establish structured interaction points between the two bodies—ideally, one joint workshop or thematic session per year. These exchanges would enable Member States and stakeholders to align on cross-cutting issues such as technology roadmaps, co-funding opportunities, and regulatory challenges. Joint discussions could also support the harmonisation of national and EU funding timelines, fostering a shared vision of the hydrogen innovation ecosystem.

The MoCs with the MAs should evolve into a structured, networked, and intelligence-driven framework: To unlock their full potential, MoCs should progress from bilateral cooperation to a **structured coordination mechanism** that supports the Clean Hydrogen JU's territorial and strategic objectives. Each MoC should be backed by a concise **annual activity plan** defining objectives, responsibilities, and milestones, with regular coordination meetings and progress reviews. The Programme Office should prepare an **annual synthesis report** on MoC progress—highlighting co-funding cases, regulatory bottlenecks, and policy signals—to inform the **Governing Board** and **SRG**, ensuring that implementation intelligence feeds directly into strategic planning. Shared **templates and guidance** on cost eligibility, state-aid interpretation, and reporting should be developed to reduce administrative complexity and promote consistency. A **community of practice** among MoC signatories, meeting twice per year and supported by a digital platform, would enable structured peer learning and joint problem-solving. Each signatory should also appoint a **dedicated MoC focal point** to maintain communication with the JU and link MoC feedback to SRG reporting. Finally, the MoCs should incorporate a light monitoring and evaluation component, integrated within the JU's overall monitoring framework, to serve as a continuous source of intelligence on funding pipelines,

skills, and regulatory challenges. Collectively, these measures would transform MoCs into a cohesive European network of hydrogen implementation partners—reinforcing policy alignment, accelerating co-funding, and amplifying the long-term impact of JU's synergies strategy.

Strengthen external coordination protocols: Strengthening the governance of external cooperation is key to ensuring continuity and strategic alignment. The MoU with CAJU could serve as a model to formalise coordination frameworks with other HE Partnerships and EC executive agencies. Such agreements should establish a predictable **meeting cadence**, shared **information-exchange templates**, and clear follow-up mechanisms to enhance transparency and operational efficiency.

Empower knowledge management as a strategic function: Knowledge management (KM) should be elevated to a strategic function within the Programme Office. Expanding the KM officer's mandate to monitor synergy outcomes—through dashboards and targeted KPIs (e.g. number and value of co-funded projects, data-sharing activities, or joint events)—would enable continuous learning and data-driven reporting.

Create an internal tracking tool for traceability and institutional learning: A mandatory internal tool should be introduced to record all synergy-related activities, serving as a central repository for data and outputs. The Synergies Officer and the PO would systematically log interactions with the SG & SRG, other Partnerships, EC agencies, and Managing Authorities, ensuring traceability, transparency, and institutional learning.

Introduce simple synergy performance indicators: The JU should also introduce a concise set of synergy performance indicators, combining quantitative and qualitative metrics (e.g., number of co-funded actions, MoCs with active monitoring, duplication avoided, number of cross-partnership events). This will allow for consistent reporting and performance-based planning.

Promote proactive synergy planning: To mainstream synergy-building within the organisation, synergy objectives should be integrated into Programme Office staff performance goals and annual work plans, ensuring consistent commitment and reducing dependence on individual initiative.

Overall, the Clean Hydrogen JU's synergy governance framework has matured into a coherent, multi-layered system that connects strategic vision, advisory intelligence, and operational collaboration. Its core strength lies in the structured engagement of internal units, the SG and SRG advisory bodies, and external partners such as other European Partnerships, Executive Agencies, and Managing Authorities. Formal instruments like the MoUs and MoCs have enhanced transparency, trust, and alignment between EU and national priorities, while the emerging KPI and Knowledge Management frameworks are laying the foundation for data-driven monitoring and institutional learning. Yet, the system remains partly informal and person-dependent, with overlapping roles, uneven advisory engagement, and limited feedback and traceability

mechanisms. The next phase of governance development should focus on codifying roles, institutionalising consultation and reporting processes, and embedding continuous learning and performance tracking across all levels. Doing so would consolidate JU's position as a model of **strategic, evidence-based, and participatory governance** within the European R&I landscape.

3 Synergy strategic roadmap

3.1 Vision

The **Synergies Strategy** of the **Clean Hydrogen JU** articulates a vision that spans the short, medium, and long term for how the Clean Hydrogen Joint Undertaking will strengthen collaboration, coherence, and impact across the European hydrogen ecosystem. It reflects the conviction that hydrogen's contribution to the **European Green Deal**, the Clean Industrial Deal, and the Union's climate-neutrality and competitiveness objectives can only be achieved through an integrated approach that connects research and innovation with deployment, links actors across governance levels, and aligns public and private investments within a shared strategic direction. The Clean Industrial Deal's emphasis on decarbonisation, industrial resilience, and the creation of lead markets aligns closely with the JU's SRIA, positioning hydrogen technologies as key enablers of both climate neutrality and technological sovereignty. Through its synergy activities, the JU contributes to these objectives by fostering collaboration across EU, national, and regional levels, supporting co-funding and industrial scale-up, and accelerating the deployment of clean hydrogen manufacturing capacities. By mobilising Europe's hydrogen ecosystem—spanning industry, research, and innovators—and fostering synergies with complementary instruments such as the European Innovation Council (EIC) Programmes (e.g. Pathfinder, Transition, Accelerator), the Innovation Fund and the Strategic Technologies for Europe Platform (STEP), the JU aims to accelerate industrial transformation and reinforce Europe's technological leadership in the global hydrogen economy. In the near and medium term, this vision will guide concrete actions as detailed in the accompanying roadmap in Chapter 5, while maintaining a long-term perspective on systemic transformation.

3.1.1 A long-term ambition for systemic collaboration

The vision underpinning this Strategy is to establish the **Clean Hydrogen JU** as the **central coordination and knowledge hub** for hydrogen-related synergies in Europe—bridging the gap between research and innovation and full-scale market deployment. This positioning builds on a proven institutional legacy and demonstrable achievements, as well as on JU's mandate and SRIA design to act as Europe's Hydrogen Knowledge Hub. As the successor to the FCH and FCH 2 Joint Undertakings, the Clean Hydrogen JU capitalises on more than a decade of structuring Europe's hydrogen innovation landscape, delivering breakthroughs in fuel cells, electrolysers, refuelling infrastructure, and launching the first Hydrogen Valleys.

Since 2021, it has consolidated this role by managing the world's largest portfolio of hydrogen R&I projects, coordinating annual programme reviews and data collection across more than 300 actions, and providing structured technological and policy intelligence to the European Commission, Member

States, regions and standardisation bodies. Through its unique governance setup—integrating European Commission representatives, industry, research, and national representatives in the Governing Board, Stakeholders Group, and States Representatives Group respectively—the JU connects EU policy priorities with market, industrial, and territorial realities. Its tangible results, such as reduced electrolyser CAPEX, progress towards GW-scale manufacturing, demonstration of hydrogen in aviation, maritime and heavy-duty transport, and the expansion of Hydrogen Valleys across Europe, reinforce its legitimacy to orchestrate systemic collaboration across governance levels, sectors, and programmes.

By 2030 and beyond, building on this foundation, the Clean Hydrogen JU aims to have created a mature, self-reinforcing network of collaborations spanning the entire hydrogen value chain and extending across programmes, sectors, and territorial levels, ensuring that EU, national, and regional investments in hydrogen deliver maximum collective impact.

This ambition directly contributes to JU's **Strategic Research and Innovation Agenda 2021-2027**, which provides the scientific and technological foundation for the JU's mission. The vision supports all three SRIA pillars—**Renewable Hydrogen Production**, **Hydrogen Storage and Distribution**, and **Hydrogen End Uses** (Transport Applications and Clean Heat & Power)—while reinforcing the four **horizontal activities** on **Cross-Cutting Issues**, **Hydrogen Valleys**, **Supply Chains**, and **Strategic Research Challenges**. Together, these areas form the backbone of a systemic and integrated approach to hydrogen, reflecting JU's role in supporting a resilient, competitive, and climate-neutral hydrogen economy, and serving as a catalyst for knowledge transfer, industrial cooperation, and capacity building across the EU.

3.1.2 Strategic positioning within the EU policy landscape

The Strategy positions the **Clean Hydrogen JU** as a bridge between policy, research, and implementation. It is fully aligned with the Union's overarching policy and legislative framework, in particular:

- **The European Green Deal** (COM (2019) 640), which sets the blueprint for Europe's transformation into the first climate-neutral continent by 2050 and positions hydrogen as a key enabler of deep decarbonisation and industrial renewal; **The EU Hydrogen Strategy** (COM(2020) 301), which defines hydrogen as an essential component of the clean energy transition, calling for a fully integrated hydrogen value chain from production to end use;
- **The Fit for 55 Package** (2021), which operationalises the 55% emissions reduction target by 2030 through coherent measures across energy, transport, and industry
- **The European Climate Law** (Regulation (EU) 2021/1119), which sets the legally binding 2050 climate-neutrality target and 2030 emissions trajectory that underpin hydrogen deployment

- **The REPowerEU Plan** (COM (2022) 230), which reinforces hydrogen's role in energy security, diversification, and the resilience of Europe's energy supply
- **The revised EU Emissions Trading System** (ETS) (2023) **and the Carbon Border Adjustment Mechanism** (CBAM) (Regulation (EU) 2023/956) which strengthen the economic case for renewable and low-carbon hydrogen in energy-intensive industries and ensure fair competition in global carbon pricing
- **The Net-Zero Industry Act** (NZIA) (COM (2023) 161), which identifies hydrogen technologies as strategic net-zero assets essential to Europe's competitiveness and technological sovereignty
- **The Critical Raw Materials Act** (Regulation (EU) 2024/1252), which ensures secure and sustainable access to critical raw materials such as platinum group metals, iridium and rare earths used in electrolysers, fuel cells and hydrogen storage, thereby strengthening the resilience of hydrogen value chains
- **The Clean Industrial Deal** (COM (2025) 85 final), which reinforces the Green Deal's objectives by coupling decarbonisation with re-industrialisation and focusing on competitiveness, resilient clean-tech value chains and scaling strategic net-zero technologies such as hydrogen
- **The Competitiveness Compass,** which establishes a monitoring framework for Europe's long-term competitiveness across innovation, productivity, resilience, and strategic autonomy, identifying clean technologies such as hydrogen as priority sectors and calling for better alignment between R&I funding, permitting, skills, energy costs, and raw materials access.
- **The Single Market Strategy** (COM (2025) 500 final) which aims to remove administrative and regulatory barriers across Member States by simplifying permitting, public procurement, and reporting rules, thereby creating a more predictable environment for hydrogen investments, cross-border infrastructure, and industrial deployment
- **The EU Startup and Scaleup Strategy** (COM (2025) 270), which strengthens deep-tech scale-up pathways and financing (EIC, Scale-up funds, innovation-friendly procurement) relevant to hydrogen innovators and SMEs
- **The Union of Skills** to equip people for a competitive Europe (COM (2025) 90), which establishes an EU-level skilling framework (STEM plan, Skills Guarantee pilot, Skills Portability Initiative, reinforced EU Skills Academies) to upskill and reskill the workforce for

the clean transition, directly supporting hydrogen value-chain capabilities and mobility of specialised talent.

These frameworks are complemented by the **Horizon Europe Regulation** (Regulation (EU) 2021/695) and the **Council Regulation (EU) 2021/2085**, which formally established the Joint Undertakings under Horizon Europe. This legal and policy foundation mandates the JU to create and implement synergies with other Union, national, and regional initiatives to ensure the efficient use of resources and to maximise the impact of EU research and innovation investments.

Together, these frameworks promote **hydrogen as a driver of industrial competitiveness, technological sovereignty, and territorial cohesion,** defining the enabling environment in which the Clean Hydrogen JU operates. The JU's role is to ensure that hydrogen-related R&I results are not isolated achievements but integral components of a coherent European value chain—from laboratory to market.

Through structured cooperation with other **Horizon Europe European Partnerships** (e.g. Clean Aviation, ZEWTP), **EU implementing bodies** (e.g. CINEA, EISMEA), and **other EU initiatives** (e.g. SET Plan), the **Clean Hydrogen JU** will strengthen strategic alignment, complementarities, and co-funding opportunities. Collaboration with **Member States** and **regional Managing Authorities** will support the territorial roll-out of hydrogen technologies, notably via **Hydrogen Valleys**, which embody the multi-level governance and ecosystem logic at the heart of this Strategy.

3.1.3 Governance, inclusiveness, and stakeholder engagement

Achieving this vision requires a **robust and inclusive governance framework**. The Strategy envisions a synergy management process embedded within the Clean Hydrogen JU's internal processes and supported by a governance model that promotes collaboration across institutional and territorial boundaries. The **States Representatives Group (SRG)** and the **Stakeholders Group (SG)** will play pivotal roles in identifying national and regional priorities, while the **Governing Board** and **Executive Director** will oversee strategic direction and alignment with the SRIA—ensuring that synergies are embedded in the JU's strategic planning and annual work programmes.

Beyond formal structures, the **Clean Hydrogen JU** will nurture open and transparent cooperation with a broad spectrum of stakeholders, including other **Horizon Europe Partnerships**, **European Commission bodies and EU initiatives**—including industrial and research alliances—**national and regional Managing Authorities**, and **international initiatives** such as the **Clean Hydrogen Mission** and the **International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE)**.

This multi-level engagement will reinforce the **JU's** position as a global reference for partnership-based innovation and ensure that hydrogen technologies evolve within an ecosystem that is collaborative, inclusive, and strategically aligned.

3.1.4 Expected impact and adaptive outlook

In the long term, the successful implementation of this Strategy will enable the **Clean Hydrogen JU** to:

- **Leverage complementary funding and expertise**, generating higher impact per euro invested
- **Strengthen Europe's hydrogen innovation ecosystem**, connecting R&I with industrial and territorial deployment
- **Enhance policy coherence and governance efficiency**, reducing fragmentation and duplication, and
- **Increase international visibility and influence** by positioning the JU as a global reference for partnership-based hydrogen innovation.

The Strategy adopts a **dynamic and adaptive outlook**, recognising that the hydrogen landscape—and the EU policy context guiding it—will continue to evolve beyond 2027. Accordingly, it is designed as a **living framework**, allowing the JU to adjust its priorities, instruments, and cooperation modalities in line with emerging policy orientations, technological breakthroughs, and the forthcoming **Multiannual Financial Framework (2028-2034)**.

Through this approach, the **Clean Hydrogen JU** will remain at the forefront of Europe's transition towards a clean and secure energy system. It will continue to act as a **strategic enabler and integrator**, fostering synergies that accelerate innovation, strengthen industrial leadership, and translate Europe's hydrogen ambitions into tangible, sustainable outcomes for its citizens and economy.

3.2 Synergy activities to date – lessons learned and key gaps

3.2.1 Synergies within Horizon Europe Programme

The Clean Hydrogen JU operates within a complex and interdependent landscape of European Partnerships. Its ability to accelerate the development of a competitive and sustainable hydrogen economy depends on close collaboration with initiatives that address complementary parts of the research and innovation chain—from clean energy generation to mobility, transport, and industrial applications. Under Horizon Europe, partnerships are expected to maintain structured collaboration with each other and with relevant EU programmes as part of their governance and implementation models. This systemic expectation aligns with the JU's SRIA, which calls for reinforced coordination across the European hydrogen ecosystem. Accordingly, Clean Hydrogen JU's cooperation with the

Clean Aviation JU (CAJU), the Zero Emission Waterborne Transport Partnership (ZEWTP), the Clean Energy Transition Partnership (CETP), Europe's Rail JU (EU-Rail), and the European Innovation and SMEs Executive Agency (EISMEA) provides both tested experiences and lessons for shaping a more strategic, structured approach to synergies.

To reinforce this systemic approach, the JU also identifies expected synergies in its Annual Work Programmes (AWPs). Each AWP includes a dedicated section outlining planned cooperation with other European Partnerships and EU bodies involved in the HE Programme implementation for the year ahead. This practice ensures that synergies are not only strategic in intent but also embedded in operational planning and monitored as part of JU's programme implementation.

3.2.1.1 Key lessons learned

Joint R&I roadmaps as a strategic enabler, though not a guarantee of collaboration: One of the most strategic efforts to foster collaboration between the Clean Hydrogen JU and other European Partnerships has been the co-creation of joint Research & Innovation roadmaps, as outlined in Annex 7 of JU's SRIA. These roadmaps were developed with partnerships such as CAJU, 2Zero, ZEWTP, P4P, and others, and were instrumental in aligning long-term priorities, identifying complementary R&I areas, and enabling later cooperation instruments such as the Clean Hydrogen JU–CAJU MoU and joint calls. However, they do not automatically lead to effective collaboration—e.g. despite a well-developed roadmap with Process4Planet, operational cooperation has remained limited. This demonstrates that roadmaps are a necessary but not sufficient condition for effective synergies—they need to be followed by structured implementation mechanisms, clear governance, and continuous follow-up.

The MoU with Clean Aviation JU sets a benchmark for structured collaboration: A major milestone in Clean Hydrogen JU's cooperation with other partnerships is the MoU signed with CAJU. This MoU represents a formal instrument establishing a structured collaboration framework with another Horizon Europe Partnership. It sets a framework for systematic collaboration on topics of shared strategic interest, notably hydrogen production, storage, refuelling infrastructure, safety, certification, and standards. The MoU formalises practices that previously relied on informal exchanges. It enables regular contact between programme officers, early alignment on annual work programme design, project result sharing and funding synergies. This collaboration has already improved coordination between the two JUs: the Clean Hydrogen providing upstream insights on hydrogen technologies, and CAJU focusing on downstream integration in aviation systems. This **structured yet flexible model** can serve as a **replicable template** for Clean Hydrogen JU's cooperation with other partnerships.

Private-member cooperation mechanisms complement but do not substitute JU-led synergies: In addition to JU-to-JU agreements, several cooperation mechanisms have been concluded by the JU's

private members (Hydrogen Europe and Hydrogen Europe Research), such as the MoU with EURAMET[11] and the Joint Declaration with ZEWTP[12]. Although these instruments are not signed by the JU Programme Office, they contribute to the broader synergy framework by facilitating technical alignment on standards, safety and certification, and by mobilising industrial and research stakeholders around shared roadmap priorities. However, these private-member agreements differ from JU-level MoUs (e.g. with CAJU), as they do not establish structured governance, joint work programme planning or funding mechanisms. Their value is complementary: they can support the implementation of elements from joint R&I roadmaps and prepare the ground for more formal institutional cooperation, but they do not replace Programme Office–level arrangements needed for fully operational synergies.

Dialogue with ZEWTP strengthens cross-sectoral learning: The cooperation with ZEWTP started during the co-creation of the joint R&I roadmaps and SRIAs alignment. This early strategic coordination laid the groundwork for operational collaboration, which has since evolved into substantive and continuous exchanges. Regular interactions between programme officers have created mutual understanding of technical needs and policy contexts for hydrogen use in maritime transport. Discussions have focused on safety at sea, refuelling and bunkering systems, and potential standardisation needs—areas where experience from JU's land-based mobility projects can inform maritime applications. The relationship has also revealed strong potential for technology transfer and co-development of guidance on safety protocols and certification. ZEWTP and the Clean Hydrogen JU now maintain regular contact through the SG and bilateral working-level meetings and participation in each other's events, with a shared interest in exploring future coordination on research topics and workshops. Finally, a possible jointly funded call is currently under discussion for the 2026 work programme.

Engagements with CETP and EU-Rail JU are promising and should be further exploited: Contacts with the CETP and EU-Rail have so far been promising and valuable for identifying thematic complementarities**.** Dialogue under CETP's Transition Initiative 3 ("Enabling Climate Neutrality with Storage Technologies, Renewable Fuels and CCU/CCS") has highlighted the need to better connect Clean Hydrogen JU's technology-oriented research with CETP's national-level demonstration projects. Thematic discussions on storage technologies, renewable hydrogen-based fuels, and CCU/CCS pathways have identified areas for potential cooperation in bridging R&I and deployment stages. Collaboration with Europe's Rail JU (EU-Rail) has been expanded in recent years with the joint Study on the use of Fuel Cells and Hydrogen in the Railway Environment and FCH2RAIL project, but shows further potential. Interactions so far have centred on sharing information about hydrogen propulsion systems, refuelling standards, and safety aspects in rail applications. EU-Rail's interest

[11] https://hydrogeneuroperesearch.eu/her-he-and-euramet-sign-a-memorandum-of-understanding/
[12] https://hydrogeneurope.eu/wp-content/uploads/2021/11/2021.02.24-Joint_Declaration_CHE_ZEWT_final.pdf

in future demonstrations using hydrogen technologies developed under Clean Hydrogen JU projects indicates scope for stronger alignment once both JUs' pipelines mature further.

EIC collaboration demonstrates the strategic value of the innovation pipeline: The collaboration between the Clean Hydrogen JU and the EIC—implemented through EISMEA—offers a forward-looking model for bridging early-stage innovation and applied research. The two entities formalised their intent to cooperate through a Letter of Intent signed in 2022, marking an important step towards building a structured "innovation continuum" across Horizon Europe instruments. This cooperation leverages TRL complementarity: while the EIC Pathfinder supports pioneering research up to TRL 4, and EIC Transition and Accelerator instruments fund higher TRL activities and market-oriented innovation (up to TRL 6), the JU covers the full TRL range from 2 to 8. This ensures continuity along the innovation chain, allowing promising hydrogen innovations—such as advanced materials, novel catalysts, or next-generation electrolysis techniques—developed under EIC Pathfinder and Transition calls to progress towards demonstration and deployment through Clean Hydrogen JU projects. Early collaboration efforts, including joint portfolio mapping, co-drafting of the 2024 Clean Hydrogen JU Work Programme call on seawater electrolysis and regular exchanges during events such as the Hydrogen Week, have confirmed the added value of this vertical linkage. More recently, in preparation for JU's AWP 2026, the Clean Hydrogen JU and the EIC have initiated exchanges to co-develop a dedicated topic for hydrogen start-ups, capitalising on the EIC's experience in scaling SMEs and innovators. This marks a shift from informal cooperation towards structured programme-level collaboration on innovation pipeline development. Beyond individual initiatives, this partnership demonstrates that synergies are most impactful when they connect complementary stages of the innovation chain and are translated into joint programming, rather than remaining limited to ad-hoc coordination.

The SG multiplies the benefits of coordination: The SG has emerged as an effective venue for cross-fertilisation among partnerships. Several SG members are active in or connected to other JUs and Partnerships, including EU-Rail, ZEWTP, EURAMET, EASN, EIT Urban Mobility, 2Zero and the Clean Steel Partnership (CSP). Their participation ensures that strategic discussions and project insights are informed by perspectives across the wider Horizon Europe ecosystem. The SG's composition and functioning show that stakeholder-level engagement can complement institutional cooperation, embedding synergies within community dialogue and supporting the broader policy narrative around hydrogen's role in the clean transition.

Synergies with CEF Transport bridge R&I and hydrogen infrastructure deployment: Collaboration with the Connecting Europe Facility – Transport (CEF-T) has emerged as a concrete example of how JU-supported R&I outcomes can transition into infrastructure deployment. Through its collaboration with CINEA (implementing agency of CEF-T), the Clean Hydrogen JU not only contributes to the evaluation of CEF-T proposals but also ensures early alignment between hydrogen R&I priorities and

TEN-T infrastructure needs. This coordination has already produced tangible results: the JU-funded H2-ACCELERATE-TRUCKS project is progressing in parallel with five CEF-T-supported hydrogen refuelling station (HRS) deployments, demonstrating how vehicle innovation and infrastructure roll-out can advance together. Similarly, maritime hydrogen projects such as LH2CRAFT are informally coordinated with CEF-funded actions like SAFECRAFT and NH3CRAFT to ensure shared safety standards and interoperability. Hydrogen Valleys—particularly cross-border initiatives such as NAHV and BalticSeaH2—are increasingly designed with future CEF eligibility in mind, linking JU-supported feasibility and demonstration work with potential CEF financing for large-scale deployment. These examples demonstrate that EU funding instruments become most effective when R&I-driven knowledge guides infrastructure deployment and confirm CEF-T as a strategic partner for scaling hydrogen mobility across Europe.

Joint visibility is emerging as a strategic enabler: There is growing interest among the Clean Hydrogen JU and its partners in pursuing joint visibility and communication initiatives to reinforce synergies. For example, the European Hydrogen Week continues to serve as the flagship platform co-organised by the JU together with Hydrogen Europe, Hydrogen Europe Research and the European Commission, with active participation from other European Partnerships, DGs and Executive Agencies. In 2024, the JU participated alongside Clean Aviation and Europe's Rail at the Transport Research Arena (TRA 2024), jointly showcasing hydrogen's role in aviation and rail applications. Similar coordinated visibility has taken place at major Commission-led events such as the EU Industry Days, EU Research & Innovation Days, the SET-Plan Conference and the European Sustainable Energy Week, where the JU contributed to joint sessions on hydrogen innovation, Hydrogen Valleys and industrial decarbonisation. Such activities —still evolving from ad-hoc participation to more strategic coordination— strengthen the public narrative of hydrogen as a unifying European technology, position hydrogen-related partnerships as interlinked components of a single innovation ecosystem and underscore hydrogen as a shared European priority.

3.2.1.2 Structural and operational gaps

Cooperation remains uneven across Partnerships: While the MoU with CAJU stands as a strong example of structured engagement, other Partnerships, such as CETP or EU-Rail operate through informal exchanges or personal networks. Cooperation thus varies in frequency and depth, often depending on individual initiative. This unevenness results in fragmented intensity and limited predictability of collaboration. The absence of standardised frameworks for engagement leads to discontinuities when staff changes or when priorities evolve.

Lack of a structured transition mechanism between the EIC and the Clean Hydrogen JU: Despite clear complementarity and the letter of intent, cooperation between the EIC and the JU remains largely ad hoc and dependent on personal initiative. The absence of a formal mechanism for

transitioning promising EIC-funded hydrogen projects into JU's higher-TRL portfolio limits the systematic exploitation of results. Moreover, while the publicly available EIC Datahub (https://eic-datahub.eismea.eu/) provides an overview of EIC-funded projects, it does not enable the identification of hydrogen-relevant projects, and its filtering functions offer broad sectoral categorisation. Furthermore, there is currently no dedicated process for assessing transfer potential, and no template for joint monitoring or evaluation. Additionally, no joint call or coordinated funding action has yet materialised. As a result, the innovation pipeline linking the two programmes operates on an informal basis, constraining strategic visibility and continuity across the TRL spectrum.

Programming cycles and administrative procedures are misaligned: Differences in annual programming calendars and approval procedures limit the ability to design joint or sequential calls. Even when complementarities are identified early, administrative asynchrony makes coordination time-consuming and often too late to integrate into final work programmes. This reduces the potential for coordinated funding pipelines along the hydrogen value chain.

Resource asymmetries affect collaboration intensity: Institutionalised Partnerships such as the Clean Hydrogen JU and CAJU benefit from permanent governance and dedicated teams, whereas co-funded partnerships like CETP operate with smaller, less stable administrative structures. This disparity in resources constrains coordination capacity and can disincentivise more resource-intensive collaboration efforts.

Communication and visibility are fragmented: While mutual participation in events and cross-promotion of outcomes occur occasionally, communication remains primarily partnership-specific and dependent on individual initiatives. The absence of coordinated visibility actions, such as shared messaging, co-branded events, or integrated dissemination calendars, limits the perception of hydrogen-related partnerships as interconnected components of a single innovation ecosystem. Strengthening joint visibility would help convey coherence and amplify the collective impact of EU hydrogen efforts.

Data visibility and interoperability remain limited: Each partnership maintains separate databases and reporting systems, with no common interface allowing partners to view ongoing or planned projects. Without interoperable data systems or shared mapping tools, coordination remains reactive and dependent on individual awareness rather than systematic analysis, preventing proactive identification of synergies or overlaps.

Lack of shared metrics for assessing synergy outcomes: Current monitoring frameworks track partnership-specific outputs but not the results of cross-partnership cooperation. Without common indicators, such as the number of joint activities, cross-participation in events, or co-developed materials, it is difficult to assess and communicate the added value of synergies.

3.2.1.3 Strategic implications and opportunities

Replicate formal coordination mechanisms with other key European Partnerships: The MoU between the Clean Hydrogen JU and CAJU demonstrates that light, flexible governance arrangements can create meaningful and sustainable coordination. Building on these advanced synergy examples, the Clean Hydrogen JU could extend similar frameworks to other strategic partners, such as **CETP**. These should outline joint priorities, mechanisms for data sharing, and coordination routines while remaining simple to manage. Such agreements would institutionalise cooperation, ensure accountability, and provide continuity across programming cycles.

Establish a two-tier coordination mechanism for priority partnerships: For the most relevant partners —**CAJU**, **ZEWTP**, and **CETP**— the Clean Hydrogen JU could adopt a two-tier coordination structure.

At the **strategic tier**, biannual meetings among programme managers and policy officers would align priorities and discuss potential coordination of calls or studies. At the **operational tier**, ad hoc technical working groups could exchange project-level data, discuss standards and safety frameworks, and coordinate dissemination activities. This model combines flexibility with continuity, focusing effort where strategic impact is greatest.

Institutionalise the Clean Hydrogen JU-EIC pipeline through structured governance: Building on the existing Letter of Intent, the JU could establish a formal cooperation mechanism with the EIC to manage the transition of hydrogen innovations from early research to demonstration. This could include:

- a shared mapping of EIC hydrogen projects to identify those ready for JU calls
- a mutual liaison function between programme officers and
- standard templates for nominating, reviewing, and transferring project outcomes

Such measures would operationalise the innovation pipeline and demonstrate the EU's ability to bridge the full R&I continuum for hydrogen technologies.

Launch targeted joint foresight and communication actions: To strengthen strategic alignment, the Clean Hydrogen JU and the EIC could co-design foresight exercises on emerging hydrogen technologies and joint visibility actions—for instance, thematic sessions during Hydrogen Week highlighting innovation journeys from concept to market. These joint efforts would serve both strategic and communicative purposes: anticipating technological trends while showcasing the coherence of EU R&I support mechanisms.

Coordinate programming through early dialogue: To address timing misalignments, the JU could first undertake a mapping of programming cycles and key planning milestones across its main partners—including other JUs, the EIC, and CINEA—to identify overlaps and potential windows for coordination. Building on this overview, the JU could establish a structured yearly synergy-

coordination calendar enabling early exchange of draft work programmes. This would facilitate timely discussions on call alignment, thematic clustering, and sequential funding opportunities, even where full synchronisation is not feasible.

Pilot small-scale joint actions: Low-risk pilot initiatives could demonstrate tangible value from structured cooperation. In particular, piloting with ZEWTP could build on the planned 2026 complementary call topic on "Multi-fuel SOFC Powertrain for Maritime Transport", using it as a flagship example to test coordinated implementation and communication practices, such as joint progress reviews, shared technical sessions on safety and certification, or a common results dashboard. Other examples could include:

- A **co-branded communication activity with CAJU** promoting hydrogen aviation synergies
- A **collaborative mapping exercise with CETP** TRI 3 to identify R&I-deployment linkages
- A **pilot foresight and mapping action with EIC** to identify project transition opportunities

Such initiatives would deliver visible results while refining cooperation processes before scaling up.

Collaborate with EISMEA on process integration: The Clean Hydrogen JU should capitalise on EISMEA's cross-programme experience to develop templates and guidance for cooperation. Embedding such practices in administrative routines will institutionalise synergy management and reduce reliance on individual initiative.

Expand stakeholder-level cooperation: By inviting permanent representation from other partnerships, e.g., the Circular Bio-based JU, EIT Raw Materials and EIT Manufacturing, into its Stakeholders Group, the JU would anchor cross-partnership dialogue within its community ecosystem. This would ensure regular interaction, align priorities, and create a pipeline of shared initiatives driven by both institutional and stakeholder communities.

Formalising the innovation-to-deployment pathway with CEF Transport: Building on successful coordination with CEF-Transport, the Clean Hydrogen JU could further systematise this synergy by formalising a structured pipeline between Horizon Europe-funded R&I and CEF-supported infrastructure deployment. This could include early-stage dialogue on pipeline and port infrastructure needs within TEN-T corridors; shared roadmaps linking JU-funded vehicle, maritime and aviation technologies to CEF deployment opportunities; and joint guidance to project promoters on how to transition from demonstration to CEF-scale investment. Strengthening cooperation with CINEA—including regular programming-level consultations and shared monitoring of hydrogen infrastructure projects—would enhance strategic continuity across EU funding instruments. Such an institutionalised pathway would not only secure long-term deployment routes for JU-funded technologies but also reinforce hydrogen's role as a strategic infrastructure priority within the EU transport and energy policy frameworks.

Develop a shared "Synergies Information Hub": To improve transparency and planning, the JU could initiate a shared database mapping ongoing and planned projects across its closest partnerships and possibly other relevant EU organisations. Initially, this could take the form of a collaborative spreadsheet or shared workspace. Over time, it could evolve into an interoperable platform compatible with Horizon Europe's digital tools. Such visibility would enable data-driven coordination, helping identify opportunities for complementary or sequential funding and reducing duplication.

Enhance communication coherence: The Clean Hydrogen JU, CAJU, and ZEWTP could benefit from aligning communication approaches, and coordinating visibility efforts through shared narratives, key messages, and co-organised dissemination activities. Emphasis should be placed on coherent storytelling and consistent messaging that highlight complementarities across partnerships. Such coordinated communication would amplify the perception of a connected "hydrogen partnerships" cluster and reinforce the EU's narrative on hydrogen as a strategic enabler of decarbonisation.

Overall, cooperation between the Clean Hydrogen JU and other Horizon Europe partnerships shows clear progress and strong potential. The MoU with CAJU provides a replicable model of structured collaboration, while cooperation with ZEWTP exemplifies how targeted actions can anchor deeper cross-sectoral coordination. Exploratory exchanges with CETP, EU-Rail, and EIC further highlight the value of aligning horizontal and vertical synergies along the innovation chain. To maximise impact, the JU should now systematise synergy governance—scaling effective models, aligning programming cycles, and strengthening joint visibility and monitoring—to make synergies a consistent and strategic component of its operations within the wider Horizon Europe ecosystem.

3.2.2 Synergies with other EU funding programmes

The impact of the Clean Hydrogen JU can be significantly enhanced through synergies with a range of other EU funding programmes. Such a combination of funding could not only maximise the reach and efficiency of available public funding but also foster a more integrated approach to achieving the EU's decarbonisation and energy transition goals, as funded projects need to align with the different objectives and criteria of the various EU funds. A number of EU funding programmes (some of which are co-managed with national and regional authorities) already support hydrogen technologies & applications, whether explicitly or implicitly.

3.2.2.1 Key lessons learned

EU funding programmes covering multiple applications and with a large overall envelope, can provide significant potential for cooperation, and already exhibit synergies among themselves: Such programmes include for example the Recovery and Resilience Facility, the Innovation Fund (IF)

and the Modernisation Fund (MF), which focus among others on innovation and energy systems modernisation aspects, and hence cover all or most of the hydrogen applications. The IF and MF complement each pairing IF grants for advanced hydrogen technologies with MF support for grid and infrastructure upgrades in lower-income Member States. Several MSs eligible for the MF, such as Poland, Romania, Czechia and Bulgaria have received IF grants for hydrogen projects, while also using the MF to support complementary infrastructure. Other relevant programmes comprise CEF Energy and Transport, which frequently fund the infrastructure components of projects, while other funding programmes support hydrogen production or end-use applications.

EU funding programmes already exhibit synergies with Clean Hydrogen JU funding, especially regarding hydrogen valley projects: 40% of surveyed projects combined JU (Horizon 2020/Horizon Europe) funding with other EU funding sources, with half of the hydrogen valley projects surveyed combining funding. The most common EU funding programmes complementing JU funding where the RRF (75% of projects combining funding), the Innovation Fund and CEF Transport (50% of surveyed projects combining funding from each programme), reflecting their alignment with hydrogen deployment objectives.

Other EU funding programmes can represent a significant share of the overall project budget: Of the projects surveyed, half of the projects (**50%**) reported that these additional funds represented **more than 50%** of their total budget, and **25%** reported a contribution of **10-30%**, indicating a very substantial role of complementary EU funding in financing.

CINEA is a key partner for EU funding programmes with high synergy potential: The Agency manages an EU contribution of 5.6 billion Euros supporting hydrogen-related projects,[13] coming from especially the Innovation Fund, but also with CEF (Transport and Energy) and Horizon Europe being of note. CINEA highlights complementary funding synergies of the programmes it manages, either through funding of different projects along the value chain or funding projects which mature along the TRL ladder. Furthermore, the Agency promotes certain measures enhancing project synergies, such as the open-door events and annual knowledge sharing report of the Innovation Fund.[14]

Certain EU funding programmes can be deprioritised for cooperation based on a number of criteria: These criteria include whether the funding programme is expected to be continued in the next MFF (in its current or a revised form) and focus of the programme (with programmes significantly covering innovation, development of the energy system or hydrogen applications specifically particularly of interest). Some EU funding programmes might not be renewed in the upcoming MFF and therefore may not constitute a priority for exploiting synergies. For example, programmes such as LIFE may include many hydrogen applications in their scope and have significant budget volumes,

[13] https://cinea.ec.europa.eu/hydrogen-eu-supporting-europes-transition-climate-neutrality_en
[14] https://cinea.ec.europa.eu/programmes/innovation-fund/knowledge-sharing_en

but due to their limited remaining duration, they will not rank as high as other EU funding programmes; the Recovery and Resilience Facility currently constitutes an important funding mechanism, but with investments already planned in the Recovery and Resilience Plans, limited opportunities for cooperation remain. Cooperation with other EU funding programmes can be less strategic due to the focus of the programmes. Cohesion Policy funding programmes for example, will vary in relevance, with the Just Transition Fund covering only certain hydrogen applications and with a focus on supporting territories negatively affected by the transition.

3.2.2.2 Structural and operational gaps

Lack of a structural coordination framework between key EU funding programmes and the JU: For example, the Innovation Fund is managed by CINEA, while the Modernisation Fund is managed by the Member States in cooperation with the EIB and the Commission. Furthermore, limited public information is available regarding coordination mechanisms across key EU entities managing these funds.

EU agencies administering funding programmes can be constrained in resources or otherwise unavailable to further cooperate with the Clean Hydrogen JU on exploiting synergies: The project team obtained a single survey response from executive agencies, with several invitees declining to respond and referring the project team to the respective Commission service. Given the key role executive agencies can play in identifying and exploiting synergies together with the JU, this could highlight the need for further cooperation enabled by specific agency resourcing for synergy purposes.

Project promoters also indicate that there are difficulties establishing synergies between different funding sources, including national, regional and EU funds (excluding HE funding): 90% of project promoters who responded indicated that it is very difficult or difficult to create synergies. The main reasons indicated comprise 1) State aid complexity or legal uncertainty, 2) administrative complexity and high transaction costs (70% of respondents), and 3) differences in eligibility rules and misaligned timelines (60% each).

The EU regulatory framework anticipates and allows for funding synergies for some programmes, but there is limited information on the extent this has been exploited for hydrogen applications: The STEP (Strategic Technologies for Europe Platform) allows 5 EU funding programmes to provide a STEP seal to projects, providing fast-track access to 6 other EU funding programmes. Several hydrogen-related projects supported by the Innovation Fund have received the STEP seal. Moreover, the Clean Hydrogen JU 2025 working program foresees to award the STEP seal to proposals exceeding all evaluation thresholds for a number of calls, including the one on large-scale hydrogen valleys. However, structured information is not available to the extent this has allowed subsequent funding for these projects. Funding synergies between the ERDF and Horizon programmes are also

specifically foreseen, with an accompanying Commission guidance[15]. However, here also limited information is available regarding the extent of use of this facility, as for the moment it requires manual cross-referencing projects of the Kohesio with other databases.

3.2.2.3 Strategic implications and opportunities

Set-up a letter of intent and subsequent cooperation framework with CINEA in order to promote cooperation and ensure buy-in from policy officers: The letter of intent could build on the one signed with EISMEA, and the cooperation framework could mirror the one suggested for the EIC in Chapter 3.2.1. Overall, the Clean Hydrogen JU could adopt a similar cooperation framework for all relevant executive agencies, with central tracking of programming and operational actions by JU project officers.

Develop an EU funding guidance for hydrogen projects: This guide should detail the available EU (and possibly national/regional) funding programmes, their scope, timing, eligibility criteria, possibilities for combining funding and other information. It should constitute the reference, especially for project promoters who have received their first funding award, indicating funding complementarities regarding value chain stage, target TRLs, and other aspects.

Map and monitor hydrogen-related projects receiving funding from the JU and other EU funding programmes on a recurrent basis: A number of databases developed by the JU, CINEA and others (for example, the STEP seal of excellence database) list hydrogen-related projects which have received EU funding. However, there is no central database listing the EU, national and regional funding received along with other details of the projects. These databases could be linked to the Clean Hydrogen Alliance or other database of EU hydrogen projects.

Exchange on potential recommendations to enable the combination of funding with key Commission services programming funding and guiding executive agencies: With negotiations on the upcoming MFF framework taking place in 2026, specific provisions enabling the combination of funding between Horizon Europe and other EU funding programmes could be adopted. This could build on the experience gathered with the provisions put in place to enable the combination of Horizon and ERDF funding in the 2021-2027 MFF.

Overall, while clear complementarities exist between the Clean Hydrogen JU and other EU funding programmes, their full synergy potential remains underexploited due to fragmented coordination, administrative complexity, and limited structured mechanisms. Strengthening cooperation with key actors, such as CINEA, the EIB, and relevant Commission services—through formal frameworks, shared monitoring, and dedicated guidance for project promoters—would help transform ad hoc coordination into a coherent, multi-programme ecosystem supporting hydrogen

[15] European Commission (2022). Synergies between Horizon Europe and ERDF programmes 2022/C 421/03

deployment across the value chain. The upcoming MFF negotiations offer a timely opportunity to embed stronger provisions for cross-programme funding synergies, amplifying the collective impact of EU investments in hydrogen technologies and advancing the Union's decarbonisation goals.

3.2.3 Synergies with other EU initiatives

This chapter covers synergies with other EU-level initiatives that do not manage or implement EU funding programmes but have a synergistic role. The Clean Hydrogen JU operates within a wider ecosystem of EU initiatives that shape research priorities, translate policy into programmes, and support deployment. Building effective synergies with the European Energy Research Alliance (EERA) and the SET Plan Hydrogen Working/Implementation Group (TWG/IWG) is essential to bring early, lower-TRL research signals into programme design, align EU-national pipelines where feasible, and accelerate replication through place-based actions such as Hydrogen Valleys. Over time, cooperation has moved beyond ad hoc exchanges towards more regular interfaces—combining upstream intelligence from EERA's research community with the Member State-anchored coordination of the SET Plan—to inform calls, sequence complementary interventions, and enable non-funding collaboration. This section discusses the key lessons from these interactions, identifies the structural and operational gaps that still constrain impact, and sets out strategic implications to make cooperation more coherent, scalable, and durable.

3.2.3.1 Key lessons learned

EERA provides wide, low-TRL foresight: EERA has provided a wide, lower-TRL consultation channel that complements Hydrogen Europe Research's higher-TRL focus, improving early visibility on research signals and national contexts without acting as a funder. This breadth has enabled structured intelligence to flow into the JU's advisory processes, including country debriefs and overlap checks that inform call design at the concept stage when engaged early.

SET Plan Hydrogen TWG operates as a bidirectional bridge: Cooperation with the SET Plan Hydrogen TWG has been regular, productive, and mutually beneficial, with the JU participating bi-monthly, contributing expert inputs, and supporting the TWG's 2024 Declaration of Intent. This relationship has functioned as a bidirectional bridge between EU-level and Member State R&I communities, improving complementarity where priorities naturally overlap across SRIA frameworks.

Replicable models are emerging from practice: Tested elements worth mainstreaming include upstream, non-confidential "theme windows" ahead of AWP drafting to capture SG/EERA signals, and targeted checkpoints with the SET Plan pipeline to pre-align national and EU programming,

particularly in Hydrogen Valleys where sequencing and complementary financing can be orchestrated for replication and scale.

3.2.3.2 Structural and operational gaps

Advisory inputs arrive too late to shape content: Stakeholder feedback indicates that advisory inputs are often sought too late – once the programme is already largely defined ("ready-cooked") – limiting their influence on strategic topic design. This timing misalignment undermines the strategic value of the intelligence function and shortens the window for addressing overlaps or capitalising on national opportunities.

Access and transparency are insufficient for structured input: The SET Plan Hydrogen TWG's capacity to inform Clean Hydrogen JU calls is constrained by its restricted access to draft materials, with indirect intelligence through third-party participation proving insufficient. A formal yet light-touch information-sharing mechanism is lacking, particularly in areas of strong complementarity such as Hydrogen Valleys, skills, and circularity.

SET Plan Hydrogen TWG transition constrains joint action: The SET Plan Hydrogen TWG's transition into an Institutional Working Group (IWG) has created short-term uncertainty that delays formal joint actions and has slowed decisions on shared tools (foresight, agenda-setting, data protocols), even as cooperation with the JU remains regular and productive. In parallel, the absence of a systematic SG–SRG interface inside the JU leaves advisory signals fragmented and late, weakening route-through to Member State coordination via the SET Plan.

The **European Clean Hydrogen Alliance – Clean Hydrogen JU interface lacks structured data sharing and cadence alignment**: There are important synergies between the European Clean Hydrogen Alliance and the Clean Hydrogen JU, especially through the Alliance's project pipeline. The Alliance's 2025 mandate refocused its role on accelerating final investment decisions and monitoring the deployment of at least 50% of its pipeline projects by 2030, organising work through the Electrolyser Partnership and three thematic roundtables, and introducing an annual survey under a JRC-based monitoring framework with a public deployment report. While this strengthens pipeline visibility (with project data integrated in the Energy & Industry Geography Lab), the Alliance's mandate does not specify a formal two-way data-sharing protocol with the JU or alignment between the survey/reporting cycle and the JU's AWP milestones—both of which would enable sharper topic design and targeted support to shovel-ready projects. The JU's role as observer on the Alliance Steering Committee underscores the link but also the need for clearer liaison points and hand-offs.

Calendar misalignment persists across levels: Despite strong strategic convergence, operational alignment remains constrained by persistent calendar mismatches between national and EU levels, as well as by legal, state-aid, and double-funding barriers. The lack of early, non-confidential foresight

prevents Member States from preparing complementary pipelines aligned with the Clean Hydrogen JU priorities.

3.2.3.3 Strategic implications and opportunities

Intelligence must shift earlier in the programme cycle: A light, pre-draft concepting process with EERA and the broader advisory ecosystem should be institutionalised, focusing on thematic windows rather than final texts. This approach would preserve confidentiality while allowing sufficient space for meaningful evidence-based input, particularly at TRLs where EERA's breadth provides high strategic value. A brief "you said / we did" feedback note for each cycle would reinforce accountability and trust.

A light but formal interface with the SET Plan Hydrogen TWG, coordinated through the SRG, is required for early signalling: Given that Member States are the key participants in the SET Plan Hydrogen TWG, the SRG can serve as the natural channel for structured exchanges between the two bodies. Cooperation between the Clean Hydrogen JU and the Hydrogen TWG is already regular and mutually beneficial, but establishing a light formal interface—anchored in SRG coordination—would strengthen early topic signalling on Hydrogen Valleys and horizontal priorities (e.g. skills, and circularity). This setup would enable Member States to relay national priorities upstream while benefiting from JU's EU-level foresight. Introducing a simple access protocol for non-sensitive materials and recurring reciprocal updates would enhance transparency, improve policy alignment, and foster systematic coordination across EU and national levels within clear institutional boundaries.

Upgrade advisory coherence at key milestones: Time-bound SG-SRG exchanges at key AWP milestones should be facilitated to consolidate intelligence from EERA and the SET Plan channels into a single, decision-oriented narrative for Programme Officers. The SRG, in particular, could act as the structured conduit for relaying Member States' inputs gathered through the SET Plan Hydrogen TWG/IWG, ensuring that national perspectives inform programme design early and coherently. This coordination should be supported by a concise contact map of liaison functions and a shared update template, reducing interface friction and reinforcing institutional connectivity across advisory bodies.

Advance non-funding collaboration as a stable backbone: Under a secure and trusted framework that respects linguistic, confidentiality, and competitiveness boundaries, the Clean Hydrogen JU could launch joint studies and data-sharing pilots with the TWG. Actionable results should be emphasised, including a shared data-access mechanism for Hydrogen Valleys analytics and skills mapping, to strengthen policy coherence and enable early alignment with FP10 priorities.

Collectively, these findings outline a pragmatic path toward more integrated coordination across the EU hydrogen ecosystem. Advancing cooperation will require shifting intelligence earlier in the programme cycle, institutionalising a light formal interface with the SET Plan—coordinated through the SRG—and piloting practical soft alignment where full synchronisation is not feasible. Hydrogen Valleys remain the ideal testbed for complementary interventions linking EU and national pipelines. Together, these measures can unlock short-term efficiency gains, strengthen the advisory interface between Member States and the Clean Hydrogen JU, and build the structural foundations for enduring synergy throughout the current programming period and into FP10 preparation.

3.2.4 Synergies with Member States and regions

The Clean Hydrogen JU operates at the intersection of European, national, and regional policy frameworks. Building effective synergies with Member States and regions is critical to translating Europe's hydrogen ambitions into territorial investment pipelines, aligning funding sources, and fostering integrated ecosystems. Over time, cooperation has evolved from discrete project-level engagements into a more structured system of governance, guided by formal mechanisms such as the States Representatives Group (SRG) and the Stakeholders Group (SG), Memoranda of Cooperation (MoCs) with Managing Authorities (MAs), and collaboration with flagship and Hydrogen Valley projects. This chapter synthesises the key lessons learned from these interactions, highlights structural and operational gaps, and draws out strategic implications for the development of a more coherent, scalable, and systemic approach to synergies.

3.2.4.1 Key lessons learned

Synergies have evolved into multi-dimensional coordination systems: Synergies between the Clean Hydrogen JU, Member States, and regions have shifted from ad hoc interactions into structured collaboration mechanisms, anchored in shared strategic priorities. The emergence of Memoranda of Cooperation (MoCs) with national and regional Managing Authorities, the operationalisation of multi-fund models through Hydrogen Valleys and flagship projects, and the progressive institutionalisation of dialogue through the SRG and SG have collectively expanded JU's territorial reach and policy coherence. Evidence from stakeholders indicates that effective synergies emerge when collaboration moves beyond project-level exchanges to encompass governance, funding alignment, and strategic foresight.

Institutionalised governance enables sustained coordination: Institutionalised governance frameworks—such as the interdepartmental (ESF+ and ERDF) hydrogen working group of the Friuli Venezia Giulia (FVG) region –which implements the MoC with the Clean Hydrogen JU– enable

durable coordination between EU, national, and regional programmes and help align complementary interventions. Joint meetings and shared progress indicators transform political commitments into operational cooperation. These mechanisms foster continuity, reduce duplication, and cultivate mutual accountability between the JU and national/regional partners. Similarly, Hydrogen Valley projects (e.g. BalticSeaH_2, TRIERES) demonstrate that structured coordination mechanisms between project consortia, national funding authorities, and the Clean Hydrogen JU—often through joint monitoring or governance participation rather than formal joint steering committees— can effectively align rules, funding scopes, and reporting practices across instruments. In these cases, JU's participation in governance or technical exchanges, combined with active case-officer support, functions as a de facto joint steering mechanism that ensures coherence, speeds implementation, and strengthens accountability across funders.

JU involvement creates credibility and investor confidence: The "credibility signal" of the Clean Hydrogen JU selection was cited by projects as a decisive factor in attracting co-funding from national programmes and additional EU sources such as the Innovation Fund and CEF Transport. Early JU engagement increases bankability and investor confidence, often serving as a quality stamp that catalyses multi-fund participation. In this sense, being awarded in a JU call goes a step beyond receiving the STEP seal (for projects which meet all quality requirements under Horizon Europe, Innovation fund calls and 3 other EU funding programmes).

Early and continuous dialogue improves programme alignment: Stakeholders repeatedly underlined that synergies can be most effective when national and regional authorities engage before strategic or programming decisions are finalised. Advanced notice of SRIA planning cycles allows Member States and regions to integrate hydrogen priorities into their operational programmes, facilitating synergy and thematic coherence

Calendar synchronisation facilitates effective co-funding: Joint programming and calendar alignment between the JU, the European Commission, and national or regional instruments emerged as a key enabler of multi-source financing. Misaligned call windows currently force project consortia to rely on fragmented or sequential applications, reducing coherence. Stakeholders agreed that synchronised programming calendars would allow projects to assemble complete financing packages within a single investment window.

Strong coordination and project leadership enable multi-source funding: Flagship and Hydrogen Valley projects reveal that successful blending of funds depends on robust governance, transparent leadership distribution and close coordination with the JU. Well-structured management models reduced administrative friction and improved responsiveness to national or regional funding opportunities. Projects led by experienced teams demonstrate better results in structuring layered financing. In less experienced regions, PDA support has proved critical in building the administrative and financial management capacity necessary for complex projects.

Layered financing architectures demonstrate scalability: Multi-source financing—when each instrument supports distinct yet complementary project components—can mobilise larger and more sustainable investments. The *TRIERES* project in Greece exemplifies this by combining JU funding, Innovation Fund, CEF, RRF, and EIB contributions under clear scope boundaries and coordinated governance. This layered structure has emerged as a model for effective blending and risk management.

Shared monitoring and interoperable reporting build efficiency: Where shared monitoring tools exist, such as in the case of flagship and Hydrogen Valleys projects, coordination efficiency improves. Streamlined templates and interoperable data platforms reduce duplication and strengthen transparency between co-funders and beneficiaries.

Regulatory and market clarity unlock co-funding potential: For both flagship projects and Hydrogen Valleys, clear interpretation of State aid rules, RFNBO certification, and permitting standards, as well as demand creation mechanisms, remain decisive for investor security and for scaling up. Without these, offtake uncertainty and delayed final investment decisions persist, limiting the effectiveness of funding synergies. Regulatory harmonisation at the EU level would help de-risk multi-source investments.

Collaborative coordination mechanisms foster agility: Experience from Hydrogen Valley projects shows that effective multi-fund governance does not require formal joint steering committees but rather structured coordination between funding authorities, the Clean Hydrogen JU, and project consortia. Proposals from several projects to establish **Joint Funder Boards**—bringing together the JU, relevant Commission services, and national authorities—illustrate how agile governance can strengthen coherence in rule interpretation, monitoring, and decision-making. Similar benefits have already been achieved through JU's participation in project governance and monitoring processes, which act as de facto coordination platforms. Scaling these practices into light, standing mechanisms would enhance responsiveness, reduce administrative friction, and improve the consistency of co-funded project implementation across programmes.

Regional knowledge networks amplify participation: The S3 Hydrogen Valleys Partnership, connecting over 60 regional and local authorities, provides an effective platform for knowledge sharing and mutual learning. Its voluntary, thematic cooperation format helps regions access best practices and engage with JU initiatives, highlighting the value of structured regional intelligence mechanisms.

Continuous interaction nurtures trust and legitimacy: Regular engagement through SRG meetings, regional workshops, and Hydrogen Valleys events reinforces a sense of joint ownership. Repeated interaction between the Clean Hydrogen JU and Member States and regions builds institutional trust—an essential enabler of synergy implementation and policy coherence.

Institutional alignment and trust build durable synergies: synergy success correlates with institutionalised governance, layered financing, effective communication, and regulatory predictability. These conditions create trust and continuity across all the hydrogen ecosystem levels.

3.2.4.2 Structural and operational gaps

Limited diffusion of structured governance mechanisms: Most Member States and regions lack permanent platforms for coordinating hydrogen investments across funding streams. Institutionalised governing bodies such as hydrogen councils/boards/steering committees and institutionalised cooperation frameworks such as the existing MoCs remain exceptions rather than the norm, leaving coordination dependent on informal exchanges.

Misaligned programming cycles hinder synergy realisation: The absence of synchronised programming and call calendars prevents the formation of integrated project pipelines. ERDF and JTF cycles often close before JU calls launch, while programme reprogramming windows remain inflexible. Many potential synergies are lost due to mismatched funding windows and eligibility periods.

Persistent disparities in administrative and technical capacity: Smaller or less experienced Managing Authorities and regions struggle to engage effectively in complex multi-fund frameworks. Without targeted support, capacity gaps risk reinforcing geographical imbalances.

Fragmented monitoring and reporting frameworks: Multiple audits and portals, incompatible reporting templates for co-funded projects, and unclear responsibility splits increase administrative costs and confusion among beneficiaries and create inefficiencies, particularly for smaller organisations or less experienced regions. Harmonised monitoring frameworks remain lacking, particularly for projects financed by multiple instruments. The lack of data interoperability complicates performance tracking and joint evaluations.

Lack of legal clarity and administrative complexity discourage blending and replication: Divergent eligibility rules, high transaction costs, and uncertainty over State aid compatibility continue to deter joint funding efforts among authorities and investors, leading to lost opportunities and even partial contract termination and project suspension in one case (HOPE flagship project).

Governance integration remains partial and reactive: Although the SRG, the S3 Hydrogen Valleys Partnership and the MoC-based cooperation with MAs provide platforms for dialogue, they are not systematically involved in **upstream programming**—before Work Programme or Operational Programmes design phases—limiting their influence on strategic alignment. This restricts early convergence of priorities between the JU, Member States and regions.

Absence of unified monitoring of synergy outcomes: The Clean Hydrogen JU currently lacks a central tool to capture, quantify, and analyse the impacts of its synergy activities, hindering evidence-based learning and adaptive management.

Systemic misalignment undermines synergy scaling: Collectively, these gaps highlight that the challenge lies not in willingness but in system design: regulatory complexity, fragmented coordination, and uneven capacity remain the main barriers to scaling synergies from pilots to systemic practice.

3.2.4.3 Strategic implications and opportunities

Synergies must evolve from experimental to systemic practice: While the JU has successfully catalysed many cooperation models, future success depends on institutionalising synergy design within governance processes, programming, and project support. Synergies should become a built-in function, not an outcome of individual initiative.

Promote replication of successful governance models: The JU should document and disseminate the most effective frameworks identified—such as the MoC-based cooperation with the national managing Authority of Bulgaria and the ERDF and ESF+ Managing Authorities of the Friuli Venezia Giulia region. These examples can serve as models for replication, encouraging similar cooperation with other national and regional MAs that view hydrogen as a strategic priority, have available funding capacity, and are committed to leveraging it in support of hydrogen development. The existing MoCs structure dialogue, guide annual hydrogen workplans, and help align funding calendars across multiple instruments, demonstrating how bilateral arrangements between the JU and the MAs can institutionalise cooperation beyond project-based interactions. Future MoCs could evolve into structured multi-annual cooperation platforms, ensuring continuity and shared accountability between the JU and regional or national partners.

Pilot Joint Funder Boards for multi-source projects: Building on the coordination practices observed in Hydrogen Valley projects—where JU participation in governance and monitoring has already acted as an informal alignment platform—the JU could pilot Joint Funder Boards bringing together the JU, relevant Commission services, and national funding authorities (notably those managing the Innovation Fund, CEF, RRF, ERDF, and JTF). These Boards would oversee co-funded projects, address eligibility or legal issues in real time, and ensure consistent interpretation of rules. Initial pilots could focus on large, multi-source projects such as flagship and Hydrogen Valleys, providing a structured proof of concept before wider roll-out.

Synchronise programming cycles through structured coordination: The JU should establish a structured Call Calendar Dialogue bringing together DG RTD, REGIO, ENER, and MOVE to coordinate programming timelines and thematic priorities. A shared digital “funding calendar” could visualise

complementarities, helping national and regional authorities align calls and plan sequential funding actions.

Develop harmonised monitoring and reporting frameworks: The JU should lead a Synergy Reporting Harmonisation Initiative with DG REGIO and CINEA to align reporting templates and systems across co-funding instruments. Interoperable platforms and shared reporting standards would reduce administrative burden for beneficiaries, enhance transparency among co-funders and enable data-driven governance across programmes.

Foster regulatory coherence and demand alignment: Working with the Commission and Member States, the JU should promote consistent interpretation of State-aid rules, RFNBO certification, and permitting procedures. Documenting and disseminating examples of regulatory alignment and demand-creation mechanisms tested in flagship and Hydrogen Valley projects would support replication and strengthen investor confidence.

Streamline and clarify co-funding practices and State aid compliance: The JU, in cooperation with DG RTD, DG REGIO, and DG COMP, could develop a harmonised set of tools and guidance to facilitate compliant and efficient co-funding. This could include blending templates, eligibility checklists, and model agreements that MAs can easily adapt to their national and regional contexts, accompanied by clear Synergy Guidance Notes clarifying State aid compatibility, double-funding safeguards and examples of compliant multi-source financing structures (e.g., from existing Hydrogen Valleys and flagship projects to provide real-world illustrations of effective blending). Complementary training modules—delivered through the Hydrogen Academy or regional workshops—would help empower MAs and project promoters, particularly in less experienced regions, to design bankable and scalable hydrogen investment portfolios.

Establish permanent feedback and coordination mechanisms with MAs: The JU should launch a biannual coordination forum with its MA-MoC partners to exchange on synergy implementation, address operational challenges, and collect feedback for future Annual Work Programmes. Open to other interested authorities, this forum would ensure continuous dialogue, shared accountability, and stronger governance of hydrogen synergies.

Leveraging regional intelligence through a Synergy Learning Network: The JU could, in cooperation with DG REGIO and the S3 Hydrogen Valleys Partnership, establish a joint Synergy Learning Network serving as a platform for structured knowledge exchange and capacity-building on practical aspects of co-funding, governance, and regulatory alignment. Building on the experience of the S3 Hydrogen Valleys Partnership Working Group on Long-term Investments in Hydrogen Projects, the JU could contribute its expertise from Memoranda of Cooperation, Hydrogen Valleys, and flagship projects to develop targeted guidance and training—potentially through the Hydrogen Academy—thereby

strengthening regional capacities, facilitating replication of successful models, and positioning itself as a key enabler of coherent hydrogen investment across Europe.

Create a "Regions Cluster" within the SRG framework: To strengthen strategic coordination with regions, the JU could establish a Regions Cluster within the SRG, serving as the institutional bridge between the JU's territorial partners and the S3 Hydrogen Valleys Partnership. The Cluster would channel regional insights—especially from S3 Hydrogen Valleys Partnership Working Groups on investment and ecosystem development—into JU's programming and policy dialogue, ensuring bottom-up intelligence informs strategic planning.

Deepen SRG-SG-MA connectivity: The JU could reinforce structured interaction between the SRG, SG, and MAs through the previously proposed Regions Cluster. This light coordination mechanism would facilitate regular exchanges on funding priorities, implementation challenges, and regulatory developments, ensuring coherence between strategic discussions at EU level and operational realities in the regions. Periodic "Synergy Exchange" sessions—linked to SRG meetings—could consolidate feedback from the SG members and MoC partners, closing information loops and supporting more integrated planning across governance levels.

Broaden non-funding collaboration channels: Beyond financial coordination, the JU should expand cooperation in areas such as skills, safety standards, permitting guidance, and investment facilitation. Collaboration with the S3 Partnership and DG GROW on thematic workstreams can ensure continuity and cross-sector alignment.

Pilot soft calendar alignment to prove feasibility: In collaboration with a few willing Member States, the JU could pilot indicative call-window synchronisation and a shared planning calendar coordinated through TWG/IWG national networks. The aim is not joint funding, but rather sequenced and complementary interventions that accelerate the deployment and replication of Hydrogen Valleys.

Launch a Synergy Dashboard for transparency and learning: The JU should introduce a Synergy Dashboard aggregating data on joint calls, co-funded projects, and regional engagement. This central tool would enable evidence-based tracking of synergy outcomes and continuous performance improvement.

Clean Hydrogen JU's dual role enables lasting impact: To unlock the full potential of synergies, the JU needs to operate as both a strategic convener —aligning policies, intelligence, and partners— and as an operational enabler - streamlining procedures and providing tools. Embedding synergy design into JU's core governance processes—linking strategy, calls, and project support- will ensure continuity and long-term strategic coherence.

The evolution of JU's cooperation with Member States, regions, and projects reveals a growing readiness to move from experimentation to institutionalisation. The lessons and gaps identified underscore that the foundation for systemic synergies is in place but requires structured reinforcement through governance, capacity, and regulatory coherence. By consolidating its role as both a convener and enabler, the JU can anchor a lasting framework for hydrogen collaboration across Europe's multilevel governance landscape.

In summary, the Clean Hydrogen JU's engagement with Member States and regions has progressed from exploratory collaboration to a mature, multi-level governance ecosystem. The next phase requires consolidating this progress through institutionalised mechanisms that align funding, policy, and governance. Replicating proven MoC models, piloting Joint Funder Boards, synchronising programming cycles, and harmonising reporting frameworks can transform cooperation into systemic practice. At the same time, leveraging the S3 Hydrogen Valleys Partnership as a vehicle for capacity building and territorial intelligence, and linking it with a dedicated Regions Cluster under the SRG, will anchor continuous dialogue and shared learning. By combining these strategic, operational, and institutional measures, the Clean Hydrogen JU can embed synergies as a core function of its governance model—ensuring coherent, scalable, and place-based hydrogen deployment across Europe's territories.

3.2.5 International synergies

As a European Partnership with a mandate to accelerate the development and deployment of clean hydrogen technologies across the EU, the Clean Hydrogen JU recognises international cooperation as a strategic enabler for cost-effective innovation, harmonised market access, and the coordinated development of hydrogen value chains. Two global flagship initiatives have been central to JU's international engagement: the Clean Hydrogen Mission (CHM) under Mission Innovation and the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE). While distinct in scope and operating model, both have contributed practical insights and tested mechanisms that can inform JU's future international positioning.

3.2.5.1 Key lessons learned

Hydrogen Valleys show how visibility and scale drive impact: CHM's structure, built around innovation, demonstration, and enabling environments, has proven effective in aligning national and industry action around common goals. Its global Hydrogen Valleys initiative, co-developed with the Clean Hydrogen JU, has enabled cross-country demonstration clustering and shared visibility. The Hydrogen Valley platform (H2V.eu), co-managed by the JU and CHM, is an operational success that supports replication and aligns closely with the JU's SRIA Pillar and Annual Work Programmes.

Global R&I coordination complements EU project pipelines: Another CHM success has been its soft coordination of global research and innovation priorities, notably through annual action plans and multilateral working groups. While not linked to centralised funding, these mechanisms have succeeded in mapping gaps, consolidating global ambitions, and promoting early convergence on non-technological barriers such as permitting, safety, and certification. Such convergence supports JU's SRIA by framing long-term R&I roadmaps within an internationally relevant context, helping avoid duplication and facilitating the uptake of JU-funded technologies.

Trusted policy platforms inform deployment conditions: IPHE operates as a policy-focused, government-to-government partnership with a mature ecosystem of task forces addressing regulatory and systemic enablers. Its long-standing Steering Committee and technical working structures (e.g. on certification mechanisms, trade rules, permitting) have enabled cross-country peer learning and regulatory intelligence sharing. Though IPHE does not fund projects or implement technologies, its outputs are widely regarded as credible references, and its governance model is lean, agile, and trusted—particularly valuable for anticipating regulatory friction points relevant to Clean Hydrogen JU-supported innovation. Its outputs are particularly relevant for JU's work on certification, safety, skills and permitting, which constitute key barriers to market uptake.

Clean Hydrogen JU–NEDO partnership showcases project-driven international collaboration: The formal cooperation agreement signed between the JU and Japan's New Energy and Industrial Technology Development Organisation (NEDO) in 2024 marks a new phase in international hydrogen collaboration. Centred on shared decarbonisation objectives, the JU has prioritised knowledge exchange, joint technical dialogue, and alignment on high-impact domains such as electrolysis, hydrogen refuelling infrastructure, and hydrogen/ammonia combustion. The combustion technology workshops co-organised by JU and NEDO in 2024 and 2025 have showcased European projects co-funded by the JU, enabling structured bilateral engagement with Japanese industrial and research leaders. This hands-on, project-driven cooperation model has demonstrated value in accelerating mutual learning, reinforcing industrial alignment, and anchoring synergies around specific TRL ranges. It offers a replicable template for technical topic-based cooperation and supports SRIA Pillars 2 and 4 by advancing applied research and cross-border industrial engagement.

Light-touch coordination models prove replicable: CHM's roadmaps and stakeholder summits, and IPHE's Early Career Network and inclusion initiatives, illustrate how structured but informal processes can extend cooperation beyond traditional actors. These models are scalable, foster peer learning, and contribute to building an internationally aligned hydrogen knowledge base.

Strategic synchronisation delivers more than joint funding: The effectiveness of CHM and IPHE has not stemmed from joint funding, but from synchronised direction-setting, shared knowledge platforms, and flexible governance. These characteristics are directly replicable and offer cost-

effective ways for the JU to maximise its international footprint while reinforcing the uptake of EU-funded technologies.

3.2.5.2 Structural and operational gaps

Funding asymmetries limit coordination: Both CHM and IPHE rely on voluntary national contributions, which are neither synchronised with JU's programming cycle nor linked to its grant mechanisms. This makes it difficult to coordinate or co-invest in demonstrators, pilot projects, or valley-scale infrastructure aligned with SRIA goals.

Asynchronous planning cycles weaken alignment: The JU operates under a multi-annual programming structure with defined calls and deliverables, while CHM updates its action plan on an annual basis and IPHE sets priorities through Steering Committee deliberations. This reduces opportunities for pre-alignment and weakens the potential for strategic convergence.

Lack of shared metrics weakens joint tracking: While the Hydrogen Valleys platform offers a shared infrastructure, there is no common monitoring framework or agreed-upon KPI set that spans across initiatives. This limits the ability to track collective progress, compare outcomes, or extract strategic intelligence from non-EU demonstration sites.

Bilateral agreements require clearer project-to-policy linkage: While the cooperation with NEDO is formalised and increasingly productive, it currently relies on ad hoc workshops and voluntary coordination. There are no pre-aligned project pipelines, matched calls, or shared deliverables. Differences in funding structures and industrial strategy make it difficult to translate policy-level convergence into operational joint programming. Without mechanisms to synchronise roadmaps or project cycles, the full potential of this collaboration for delivering SRIA-relevant impact risks remains underexploited.

Regulatory insights are not systematically integrated. Although IPHE has developed important technical outputs on certification, permitting, and regulation, there is no structured channel to feed these systematically into JU's regulatory, policy or exploitation frameworks. This disconnect prevents the full transfer of global regulatory learnings into the EU innovation deployment context.

3.2.5.3 Strategic implications and opportunities

Joint roadmaps can bridge programming cycles: The Clean Hydrogen JU should coordinate future Hydrogen Valleys initiatives with the Clean Hydrogen Mission through shared roadmaps and thematic scoping exercises. Such joint frameworks would enhance visibility, provide clearer investment signals, and ensure that demonstration activities are fully aligned with its SRIA.

Feed regulatory intelligence into R&I pipelines: The Clean Hydrogen JU should formalise its interface with IPHE's task forces through expert participation, document exchange, and joint guidance on certification, permitting, and regulation. This cooperation will ensure that regulatory insights systematically inform project design and exploitation, reinforcing SRIA Pillar 5 and supporting a more coherent and enabling framework for hydrogen deployment.

Shared metrics will enhance international learning: The Clean Hydrogen JU should collaborate with the Clean Hydrogen Mission and IPHE to co-design a core set of KPIs for tracking technology deployment, regional replication, and readiness levels. These indicators could be integrated into H2V.eu and connected to project-level monitoring tools, fostering consistency, comparability, and mutual learning across international hydrogen initiatives.

Voluntary co-funding alignment is an achievable next step: To overcome funding asymmetries, the JU should promote voluntary pre-alignment of funding envelopes with Member States and regions engaged in international hydrogen partnerships such as the CHM and IPHE, in the form of joint calls on priority themes such as hydrogen storage and import corridors, MoCs, or targeted co-financing schemes linked to valley-scale investments.

Structured bilateral partnerships enable targeted technical alignment: The evolving partnership with NEDO shows the value of focused bilateral cooperation grounded in real projects. The JU should deepen this collaboration by exploring joint scoping exercises in areas of mutual strength—such as combustion and hydrogen carriers—and promote the participation of Japanese partners in EU-led projects through associated mechanisms where appropriate. Greater visibility for co-presented project results and a shared reflection process on outcomes would also support alignment across SRIA Pillars 2 and 4. These strategic directions—if pursued in parallel with enhanced governance coordination and expanded data sharing—can significantly increase the value and impact of JU's international partnerships.

By building on tested governance models and deepening coordination with key international partners such as the CHM, IPHE and NEDO, the Clean Hydrogen JU can consolidate its role as a visible and strategic hub for global hydrogen collaboration. Strengthening governance interfaces, aligning cooperation frameworks, and improving data exchange will significantly enhance the impact of JU's international partnerships. These actions provide practical means to anchor global cooperation within the JU's delivery model, promote the uptake of EU-developed hydrogen technologies abroad, and reinforce Europe's leadership in the global hydrogen transition. In doing so, international synergies become not just a strategic objective but a concrete instrument for achieving its mission.

3.3 Strategic synergy priorities

To achieve the strategic objectives discussed in Chapter 2.1 of this document, the SBA requires all JUs to identify synergies with other Horizon Europe initiatives and other Union programmes and funding instruments, including other European partnerships and, in particular, other JUs. The synergy priorities presented below -structured into thematic clusters- aim to address this requirement, by building on the lessons learned, the structural and operational gaps, and the strategic opportunities identified in the previous sections of this document. They aim to reinforce the positioning of the Clean Hydrogen JU as the strategic interface for coordinated cooperation and shared intelligence across the hydrogen ecosystem, ensuring that R&I outputs flow more predictably toward demonstration, scale-up and deployment in 2026–2027 and beyond.

A. Strategic intelligence, governance and coordination of synergies

This cluster identifies priorities to strengthen internal governance, intelligence flows and coordination mechanisms to enable systematic and accountable management of synergies.

A1. Establish a structured and accountable synergy governance system. The JU should transition from informal, person-dependent coordination to a formalised governance framework for synergies. This includes:

- Clear definition of roles and responsibilities across Units, the Programme Office and Governing Board (RACI / decision-making structure).
- A **Synergy Coordination Framework** outlining process stages from idea intake to decision and follow-up.
- Integration of synergies into annual work plans, staff objectives and resource planning to ensure sustained ownership.

A2. Reinforce strategic steering through structured intelligence, foresight and regulatory insight. Synergy intelligence must systematically feed into governance decisions rather than remain fragmented. This implies:

- Consolidated strategic briefs to the Governing Board summarising intelligence from SG/SRG, MoCs, SET Plan and international cooperation.
- Positioning the Board as a forward-looking steering body — shifting from passive approval of AWPs to guiding cross-programme and territorial synergies.
- Development of synergy dashboards and key performance indicators (KPIs) to support management-level monitoring, decision-making and FP10 preparation.
- Regular foresight exercises on technology, infrastructure, skills, and supply chain resilience to guide Work Programme design.

- Early engagement with DG COMP, DG ENER and national regulators to anticipate regulatory obstacles affecting multi-source funding and market uptake.

A3. Systematise advisory body engagement (SG & SRG) as a strategic co-creation mechanism. The SG and SRG should evolve from reactive consultees to proactive co-design partners for programming and synergies. This requires:

- Earlier involvement in AWP pre-scoping; predictable annual consultation calendars.
- "You Said / We Did" mechanisms to ensure traceability and motivate meaningful inputs.
- Joint SG–SRG thematic sessions to break silos and align industrial, national and regulatory perspectives.
- Reform of the SRG annual report into a forward-looking intelligence tool with harmonised templates, future funding outlooks and MoC insights integrated.

A4. Integrate territorial intelligence and MA-MoC networks into strategic decision-making. MoCs with MAs should evolve from bilateral agreements into a structured network of territorial intelligence and co-funding coordination. This entails:

- Annual activity plans and focal points per MoC.
- Annual synthesis reports from MoCs feeding into SG/SRG/GB discussions and Work Programme design.
- A digital platform or "**community of practice**" for MoC signatories to share best practices, regulatory solutions and funding opportunities.

A5. Formalise external partnership/cooperation frameworks. To reduce reliance on informal contacts, the JU should formalise cooperation with HE Partnerships, agencies and Commission services by:

- Extending the Clean Hydrogen JU–CAJU MoU governance model to other partnerships (e.g. CETP, Europe's Rail, CINEA, EISMEA) with light cooperation frameworks defining joint priorities, liaison roles, meeting cadence and data-sharing protocols.
- Using standard templates for MoUs, joint calls and liaison structures to ensure consistency and scalability
- Leveraging existing knowledge tools (Hydrogen Observatory, Knowledge Hub, H2V.eu, Energy & Industry Geography Lab) as shared intelligence platforms.

A6. Strengthen early-stage strategic intelligence from EU initiatives (EERA, SET Plan Hydrogen TWG/IWG, Clean Hydrogen Alliance). Upstream intelligence must feed into programme design earlier and more systematically. This requires:

- Institutionalising non-confidential "theme windows" with EERA, SG and SRG during AWP pre-scoping to capture early low-TRL research signals.

- Creating a light formal interface between SRG and the SET Plan Hydrogen TWG/IWG to synchronise EU–national perspectives, especially on Hydrogen Valleys, skills and circularity.
- Aligning with the Clean Hydrogen Alliance by establishing data-sharing protocols and synchronising its annual deployment survey/report with AWP preparation timelines.

A7. Develop knowledge management systems, shared information tools and synergy dashboards. Knowledge management should evolve into a strategic backbone for synergy coordination. Key actions include:

- Creating a digital **Synergies Information Hub** mapping all ongoing and planned synergy-related projects and initiatives across partnerships, regions and EU instruments.
- Developing common templates for MoUs, project follow-up, joint call planning and liaison structures to standardise cooperation processes.
- Launching a **Synergy Dashboard** consolidating quantitative indicators (co-funded projects, joint events, MoC implementation, advisory inputs) and qualitative intelligence to support evidence-based governance.

A8. Monitor and evaluate the evolving synergy landscape. Synergies should be steered through systematic monitoring, evaluation and adaptive learning. This implies:

- Establishing a **Synergy Landscape Tracker** combining quantitative data (joint calls, shared outputs) with qualitative intelligence from EU initiatives, regions, SET Plan, MoCs and international partners.
- Embedding regular review cycles that feed into AWP design, Governing Board discussions, governance revisions and FP10 preparations.
  Involving all staff with external interfaces (Programme Officers, Synergies Officer, KM team, MoC focal points) in the monitoring process.
  Conducting periodic **synergy gap analyses** to identify unrealised potential, bottlenecks and emergent opportunities.

B. Cross-Partnership and cross-programme alignment

This cluster focuses on aligning Clean Hydrogen JU with other EU partnerships and funding instruments to create structured, scalable cooperation models and innovation-to-deployment pathways.

B1. Institutionalise and scale up flexible cooperation frameworks with key partnerships and EU programmes. The Clean Hydrogen JU should move from informal exchanges to light, structured cooperation models with key Horizon Europe Partnerships (e.g. CAJU, ZEWTP, EU-Rail, CETP, 2Zero) and relevant EU funding bodies (CINEA, EISMEA, EIC). In particular, it should**:**

- Replicate and adapt the Clean Hydrogen JU–CAJU MoU model to other strategic counterparts, defining joint priorities, coordination routines, and shared intelligence loops while keeping frameworks light and adaptable.
- Adopt a two-tier coordination system: **a programmatic tier** for strategic alignment (topics, foresight, joint studies) and an **operational tier** for data sharing, project mapping, standardisation, and dissemination.
- Use this modular approach to create scalable, easy-to-manage collaboration agreements across the ecosystem.

B2. Create a structured innovation-to-deployment funding pathway across EU programmes. To link R&I outcomes with deployment financing and scale-up, the JU should:

- Establish a coordinated pipeline across EIC → Clean Hydrogen JU → Innovation Fund/CEF.
- Jointly map hydrogen-relevant projects across HE Partnerships and EU programmes and identify those ready for transfer to Clean Hydrogen JU calls
- Coordinate with CINEA/CEF to ensure JU-funded technologies feed into infrastructure deployment (e.g. hydrogen valleys, transport corridors).
- Use hydrogen valleys and multi-source flagship projects as demonstration cases for blended funding pathways.

B3. Align programming cycles and enable joint or complementary actions. To overcome fragmented planning and unlock joint investments, the JU should lead alignment of funding cycles and thematic priorities across key actors. Key actions include:

- Mapping partner programming cycles and call timelines (CAJU, CETP, EIC, CINEA/CEF–IF etc.) to identify windows for complementary or sequential funding across the R&I–deployment chain.
- Establishing an annual synergy coordination calendar with key partners to synchronise planning
- Testing pilot joint or synchronised calls, such as the planned joint topic with ZEWTP in 2026, to demonstrate feasibility, co-brand outcomes, and build trust.

B4. Develop shared intelligence, monitoring tools and data interoperability for synergies. Current data fragmentation limits strategic decision-making and visibility. The Clean Hydrogen JU should:

- Develop or expand a **Synergies Information Tracker** mapping hydrogen projects funded by the JU, IF, CEF, RRF, MF and national funds.
- Link this to existing platforms like the Hydrogen Observatory, Knowledge Hub or the Energy and Industry Geography Lab, where possible.

- Introduce shared indicators (e.g. joint calls, co-funded projects, TRL transfers, infrastructure linkages) to inform decision-making and Governing Board oversight.

B5. Strengthen joint communication and visibility to support political positioning (optional but strategic). Synergies are reinforced when partnerships present a united strategic narrative. The JU should:

- Coordinate joint visibility with CAJU, ZEWTP, Europe's Rail, etc. at events such as Hydrogen Week, TRA, EU R&I Days.
- Co-brand key outputs and showcase concrete R&I-to-deployment success stories (e.g. Clean Hydrogen JU-supported technologies → CEF-funded hydrogen infrastructure).
- Use communication strategically to build political support for synergies in the next MFF.

C. Multi-level territorial cooperation

This cluster defines how the JU can structure coordination with national and regional authorities to support Hydrogen Valleys, blended funding and territorial replication.

C1. Strengthen and institutionalise multi-level coordination with national and regional partners. Synergies must evolve from ad hoc interactions into a structured, systemic model of territorial cooperation anchored in governance, programming and project delivery. In this regard, the Ju should

- Formalise multi-level **coordination mechanisms** by evolving MoCs with Managing Authorities into multi-annual cooperation platforms with focal points, annual work plans and reporting duties.
- **Establish Joint Funder Boards** for flagship and Hydrogen Valley projects to ensure legal compatibility, resolve State aid and eligibility issues in real time, and align monitoring across JU, Commission services (RTD, REGIO, ENER, MOVE), Innovation Fund, CEF, RRF and national/regional authorities.
- **Launch an Annual Call Calendar Dialogue** with DG RTD, REGIO, ENER and MOVE — synchronising programming cycles and signalling SRIA priorities early so Member States can align Operational Programmes.
- **Create permanent feedback fora with Managing Authorities** (linked to SRG and MoC partners) to align on evolving rules, regulatory bottlenecks and co-funding opportunities.
- Ensure this coordination architecture becomes scalable across other European Partnerships and funding instruments beyond Clean Hydrogen JU's immediate remit.

C2. Synchronise funding calendars and programming cycles to unlock co-funding. Misaligned call windows and programming cycles remain a systemic barrier to integrated funding. To tackle this challenge, the JU should:

- Develop a shared digital hydrogen funding calendar mapping national, regional and EU-level call windows and reprogramming opportunities.
- Pilot soft calendar alignment/sequenced funding windows with willing Member States for Hydrogen Valleys and strategic industrial projects.
- Use SRG and MoC platforms to provide advance SRIA/AWP signals, allowing integration in Cohesion Policy, RRF or national hydrogen strategies before calls are closed.
- Link Call Calendar Dialogue outcomes to Work Programme preparation and Governing Board briefings.

C3. Enable layered and blended financing through tools, legal clarity and joint coordination. To scale multi-source financing, practical instruments and legal certainty are required. The JU could contribute to this by:

- Developing standard blending templates, eligibility checklists, State aid guidance, and model agreements for combining HE, Innovation Fund, RRF, ERDF, JTF and CEF funding.
- Co-developing **Synergy Guidance Notes** on State aid, RFNBO rules, permitting, double-funding safeguards and regulatory alignment (DG RTD, DG REGIO, DG COMP).
- Using **Joint Funder Boards** (as per C1) as light governance structures to coordinate funding decisions, legal interpretations and monitoring for multi-source projects.
- Documenting and disseminating layered funding models (e.g. TRIERES, BalticSeaH_2) to support replication.

C4. Strengthen administrative capacity and reduce territorial disparities. Institutional asymmetries risk limiting which regions can participate in hydrogen investment pipelines. To help address this, the JU could

- Develop targeted capacity-building modules via the Hydrogen Academy and regional workshops on blending, State aid, permitting, AWP alignment and investment packaging.
- Provide technical assistance / PDA-style support for less experienced regions to develop Hydrogen Valleys and co-funded investment portfolios.
- Establish a **Synergy Learning Network** (with DG REGIO and S3 Hydrogen Valleys Partnership) to share governance models, regulatory solutions and funding strategies.
- Promote replication of successful models (e.g. Friuli Venezia Giulia interdepartmental hydrogen working group) where political commitment and funding capacity exist.

C5. Institutionalise intelligence and feedback loops across SRG, SG, MA MoCs and regional ecosystems. Territorial knowledge must inform programming decisions rather than remain fragmented or retrospective. In this regard, the JU should

- Engage SRG and SG early -in AWP pre-scoping- via structured consultation calendars and clear feedback timelines.
- Create a Regions Cluster within the SRG to link JU with S3 Hydrogen Valleys Partnership and MoC Managing Authorities to channel regional intelligence into programme design.
- Introduce "You Said / We Did" reporting for feedback accountability.
- Hold joint SG–SRG thematic sessions on valleys, skills, permitting and industrial priorities.
- Systematically connect intelligence from SRG, SG, MoCs, Hydrogen Valleys and JRC/Energy Geography Lab into Governing Board briefings and Work Programme drafting.

C6. Use Hydrogen Valleys and regional platforms as engines for replication and scaling. Hydrogen Valleys serve as testbeds for integrated funding, governance and regulatory learning. The JU should

- Position Valleys as living laboratories, extracting lessons on financing models, governance, permitting, demand creation and feed these into FP10 and regulatory innovation.
- Formalise cooperation with the S3 Hydrogen Valleys Partnership—transitioning from voluntary networking to structured alignment on investment planning, skills and ecosystem development.
- Deepen collaboration with the European Clean Hydrogen Alliance by aligning survey cycles, project pipeline data and reporting milestones with JU AWP design.
- Develop an interoperable Synergy Dashboard mapping co-funded projects, regional engagement and outcomes across programmes.
- Use Clean Hydrogen JU project selection — alongside STEP seal — as a credibility and bankability signal for national/regional financing decisions.

D. International cooperation and global leadership

This cluster outlines how the Clean Hydrogen JU should structure global partnerships, align priorities internationally and promote EU-developed technologies in global markets.

D1. Formalise strategic international alignment and shared priorities. The JU should transition from ad hoc global engagement to structured cooperation with major international hydrogen initiatives such as CHM, IPHE and like-minded global partners. This requires:

- Co-developing joint roadmaps and strategic priorities (e.g. Hydrogen Valleys, electrolysers, import corridors, certification).
- Introducing shared monitoring frameworks and thematic indicators (TRLs, replication, valley maturity) through platforms such as H2V.eu.
- Holding predictable Annual International Synergy Dialogues with CHM, IPHE and national SRG representatives to guide joint programming and avoid duplication.

D2. Expand bilateral, project-based technical cooperation models. Pragmatic collaboration should be strengthened through replicable bilateral frameworks beyond the JU–NEDO partnership. This implies:

- Establishing bilateral technical workstreams on selected topics (combustion, hydrogen carriers, refuelling infrastructure, maritime and aviation applications).
- Enabling participation of international partners in EU demonstration projects and Hydrogen Valleys where legally permissible.
- Using Hydrogen Week and other JU events as structured milestones with follow-up actions.

D3. Systematically integrate global regulatory and standards intelligence. Regulatory insights from international bodies must feed proactively into EU programming and governance. This requires:

- Active participation in IPHE task forces and structured exchanges on certification (RFNBOs), safety standards, skills and permitting frameworks.
- Channelling global regulatory intelligence into SRG/SG consultations, Governing Board briefings and AWP design.
- Producing joint guidance documents and harmonised approaches where feasible, in cooperation with DG ENER, DG MOVE and DG RTD.

D4. Develop shared global monitoring, data and replication tools. To enhance visibility, learning and international replication of EU hydrogen solutions, the JU should:

- Co-develop a small set of global KPIs with CHM/IPHE (e.g. technology readiness, cost benchmarks, valley replication, investments).
- Integrate these indicators into H2V.eu and the JU Synergy Dashboard as part of a Global Synergy Tracker.
- Use this intelligence to update the SRIA, inform future European funding R&I programmes and support joint international investment decisions.

D5. Embed international cooperation into JU governance, funding cycles and project delivery. To ensure continuity and accountability of international action, cooperation must be institutionalised. This implies:

- Integrating international objectives into AWPs, SRG/SG consultations, Governing Board discussions and the Synergies Officer's mandate.
- Encouraging voluntary alignment of national or regional funding envelopes around shared international priorities (e.g. hydrogen storage, imports, valley replication).
- Requiring major funded projects — especially Hydrogen Valleys and flagship initiatives — to include international cooperation and exploitation components.

- Exploring instruments such as Global Gateway, EIB and NDICI to enable joint EU–global co-investment models.

3.4 Synergy management

The management of synergies within the Clean Hydrogen JU is key to maximising the impact of European, national and regional investments in hydrogen technologies. Building on the Synergy governance section (section 2.4), this section explains how collaborations should be prioritised, implemented, and monitored operationally. It presents a practical and forward-looking framework for managing synergies under the 2021-2027 MFF, with flexibility for the 2028-2034 period. The aim is to evolve from an ad hoc, initiative-driven and reactive approach to a structured, proactive, and learning-oriented coordination model.

3.4.1 Management principles and operating model

Clean Hydrogen JU's future synergy management model will be guided by three overarching principles:

1. **Strategic alignment** – All synergy actions should demonstrably support one or more SRIA pillars and contribute to the JU's long-term objectives, ensuring that resources are channelled to areas with the highest technological and policy leverage.
2. **Proportionality and adaptability** – Management processes should be efficient, scalable, and proportionate to the scope and maturity of the synergy, avoiding unnecessary administrative burden.
3. **Transparency and institutional learning** – Synergy outcomes should be captured systematically, shared across teams, and feed back into programming cycles.

Building on these principles, the synergy management can be operationalised through a **Synergy Coordination Framework** (see Figure 9), consisting of the following interlinked stages:

1. **Intake**: **Identification and briefing**. Potential synergy opportunities will be identified by Project Officers (POs), advisory bodies (SG, SRG), or external partners. Each opportunity will be summarised in a *Synergy Brief* form, including information on partners, SRIA alignment, expected benefits, and preliminary feasibility. This brief will serve as a light, standardised intake tool to ensure comparability across synergy types and origins.
2. **Assessment**: **Prioritisation and preliminary evaluation**: Once the Synergy Brief is submitted, the SO, in close collaboration with the relevant PO, will conduct an assessment using the Synergy Prioritisation Framework (see Annex A.2.1). The assessment will focus on strategic relevance, resource implications, complementarity with ongoing activities, and mutual added

value. It will also help differentiate between programmatic synergies (e.g., with other HE European Partnerships) and operational synergies (e.g., with national/regional authorities or executive agencies). This stage aims to determine whether the proposed synergy represents a meaningful, feasible, and beneficial collaboration opportunity. The outcome will be summarised in an Assessment Note with a preliminary recommendation on whether the opportunity should proceed to validation.

3. **Decision**: **Approval**. The evaluated synergy proposals will proceed through one of two **decision pathways**, depending on their scope and strategic importance:

   I. Path A – Strategic or Programmatic Synergies: These synergies, which involve formal cooperation, cross-programme alignment, or budgetary implications, will be submitted to the Executive Director (ED) for endorsement. The ED's decision will follow a formal recommendation by the HoO.

   II. Path B – Operational Synergies: These synergies concern technical coordination, informal exchanges, or data-sharing and will be approved directly by the HoO, who will subsequently inform the Executive Director.

   The dual-path approach will ensure that the level of decision-making corresponds to the strategic weight of the synergy while maintaining agility for operational coordination.

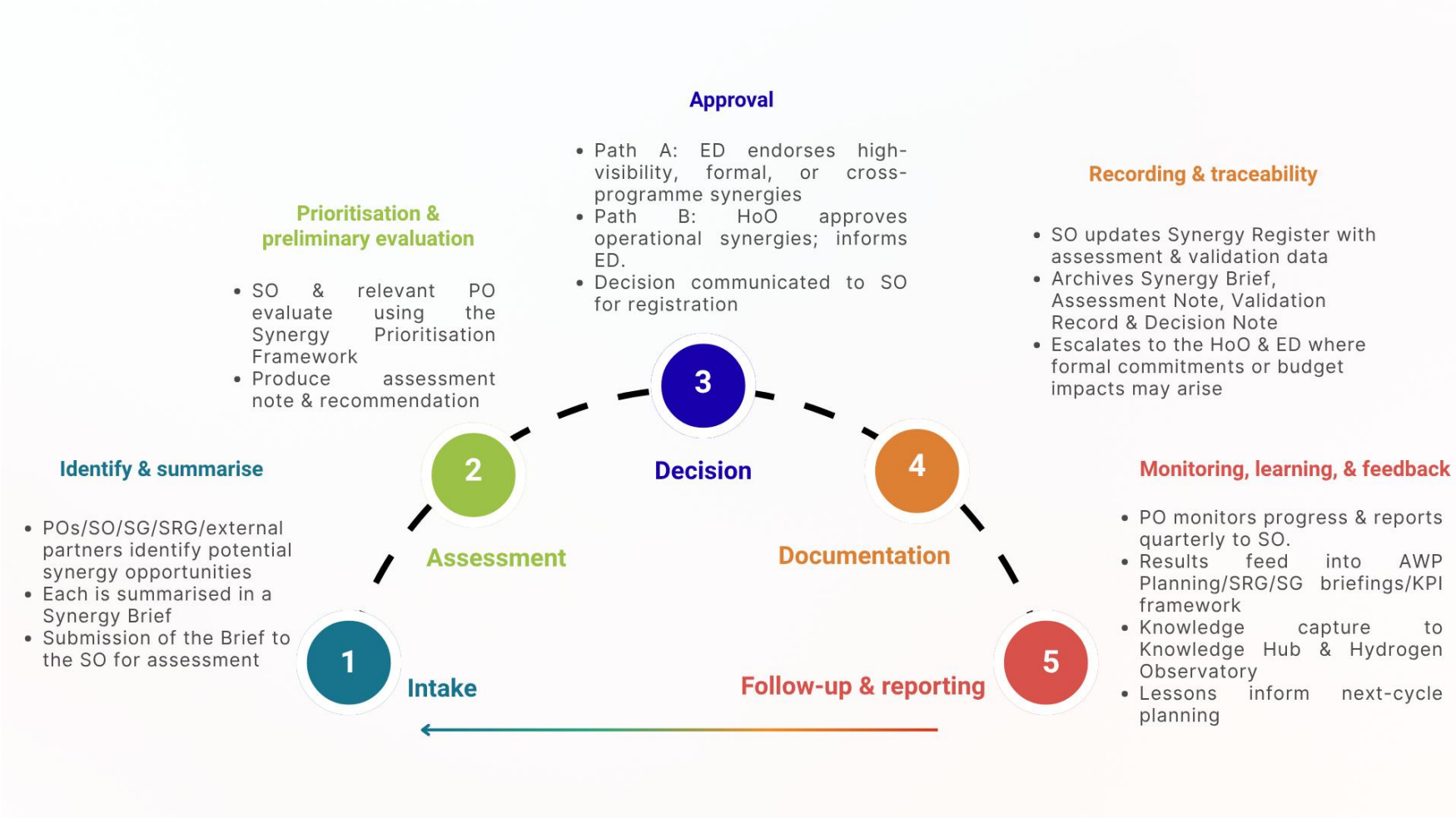
4. **Documentation: Recording and traceability.** Following approval, the Synergies Officer will ensure that all relevant materials are accurately recorded in the Synergy Register, which will serve as the central repository to classify and track all synergy initiatives, as well as escalate to the ED where needed (e.g. synergy that could lead to a formalised institutional commitment or budget implication). This repository will include the Synergy Brief, Assessment Note, Validation Record, and Decision Note. The register will enable traceability, support internal and external reporting (e.g. Annual Work Plans, Activity Reports), and provide an auditable record of the process. By maintaining consistent documentation, the Clean Hydrogen JU will ensure transparency, accountability, and institutional memory across all synergy activities.

5. **Follow-up and reporting: monitoring, learning, and feedback**. The final stage will focus on continuous monitoring and learning. The responsible POs will oversee the implementation of approved synergies using standard reporting templates and provide quarterly updates to the SO. These updates could be consolidated and integrated into the JU's Annual Work Plan (AWP), Key Performance Indicator (KPI) framework, SRG/SG briefings, and knowledge-sharing instruments such as the Knowledge Hub and the Hydrogen Observatory. This

systematic follow-up ensures that lessons learned from each synergy are captured, analysed, and fed back into the planning of future opportunities.

The process will be cyclical rather than linear. Insights gathered through monitoring and reporting will feed directly into the Intake stage, enabling the JU to identify new opportunities more proactively, refine its prioritisation criteria, and strengthen evidence-based decision-making. This feedback loop will transform synergy management from a reactive to a proactive and continuously improving process, fully aligned with JU's mission and governance model.

Figure 9: Synergy Coordination Framework



Synergy prioritisation framework

As the number and diversity of potential partners grow, the Clean Hydrogen JU will apply clear criteria to determine which synergies to pursue or deprioritise.

The Synergy Prioritisation Framework will combine strategic alignment with operational feasibility. Each opportunity will be assessed against weighted criteria as shown in Table 3 below:

Table 3: Synergy prioritisation framework - criteria

Criterion	Description	Weight (indicative)
SRIA Alignment	Consistency with SRIA pillars	25%
Mutual Benefit	Added value for both sides	25%
Implementation Feasibility	Availability of human and financial resources, timing, and administrative fit	20%
Expected Impact	Potential contribution to JU objectives and EU policy goals	20%
Strategic Visibility	Potential to raise JU's profile or strengthen cross-programme reputation	10%

More details on the interpretation of the criteria and the scoring framework are provided in the Annex A.2.1A.2.1

Synergies with high scores in alignment and mutual benefit but moderate feasibility will still be considered where external resources or complementary funding can be leveraged. Conversely, low-scoring initiatives will be revisited during the next programming cycle.

3.4.2 Roles and responsibilities

To clarify accountability and ensure seamless coordination across all stages of the Synergy Coordination Framework, the Clean Hydrogen JU could apply the RACI matrix (see Table 4). It defines who is *Responsible*, *Accountable*, *Consulted*, and *Informed* for each key task, ensuring balanced ownership and transparency in synergy management.

Table 4: RACI matrix

Process Step / Task	Executive Director (ED)	Head of Operations (HoO)	Synergies Officer (SO)	Project Officers (POs)	Knowledge Management Officer (KM)	Stakeholder Relationship Officer (SRO)	Communications Team (Comms)	SRG / SG	Governing Board (GB)
1. Identify potential synergies	I	C	R	R	C	C	I	C	I
2. Prepare Synergy Brief	I	C	R	R	S	C	I	C	I
3. Assess and score opportunities (checklist)	I	C	R	C	S	C	I	C	I
4. Validate decision (approve / reject)	A (for strategic synergies)	A/R (for operational synergies)	C	C	I	I	I	C	I
5. Formalise collaboration (MoC, MoU, etc.)	A	R	R	S	I	C	I	I	I
6. Implement and monitor synergy actions	I	R	R	R	S	C	S	C	I
7. Report quarterly progress	I	R	R	R	S	C	C	C	I
8. Update Knowledge Hub & Observatory	I	C	R	R	A	C	I	I	I

Process Step / Task	Executive Director (ED)	Head of Operations (HoO)	Synergies Officer (SO)	Project Officers (POs)	Knowledge Management Officer (KM)	Stakeholder Relationship Officer (SRO)	Communications Team (Comms)	SRG / SG	Governing Board (GB)
9. Prepare annual synergy report / KPI input	A	R	R	C	A	C	C	I	I
10. Integrate lessons learned into AWP	A	R	R	C	C	C	C	C	I
11. Disseminate results and visibility actions	I	C	C	S	C	C	A/R	C	I

(R=Responsible, A= Accountable, C= Consulted, and I=Informed)

Table 5: Interpretation of Roles in the Synergy Management Framework

Actor	Primary Function in Synergy Management	Key Responsibilities
Executive Director (ED)	Strategic oversight and final decision-maker for high-impact or inter-institutional synergies	Endorses major MoCs/MoUs; ensures alignment with SRIA and JU mandate; represents JU in formal cooperation frameworks
Head of Operations (HoO)	Operational coordinator and internal decision authority for implementation-level synergies	Oversees daily execution; approves operational synergies; ensures integration into AWP and staff planning
Synergies Officer (SO)	Central process owner and facilitator across all stages	Manages the Synergy Register; coordinates assessments and reporting; ensures methodological consistency and data capture
Project Officers (POs)	First-line identifiers and technical leads	Detect synergy opportunities; prepare Synergy Briefs; monitor and report on synergy progress within project portfolios
Knowledge Management Officer (KM)	Data integrator and analytics enabler	Maintains Knowledge Hub and Observatory inputs; develops dashboards and reports; ensures data interoperability
Stakeholder Relationship Officer (SRO)	Liaison with external actors and advisory bodies	Channels intelligence from SRG, SG, and Managing Authorities; facilitates communication and follow-up actions
SRG / SG	Advisory and intelligence providers	Contribute insights on national and sectoral initiatives; validate relevance of synergies; provide early input to programming
Governing Board (GB)	Strategic monitor and validator	Informed of major synergies; reviews annual results; validates integration of synergy activities in JU's Synergies Strategy, AWPs and SRIA
Communication Officers	Visibility, dissemination, and outreach support for synergy results	Ensures consistent communication of synergy outcomes; prepares visibility materials; organises dissemination activities (e.g. events, web content, newsletters) in coordination with the Synergies Officer and KM

3.4.3 Resources and capacities

The effective implementation of the Synergy Coordination Framework will rely on the strategic use of existing human, financial, and technical resources within the Clean Hydrogen JU. Rather than introducing new structures, the JU could optimise its current capacities, improve coordination between teams, and reinforce data-driven and communication-oriented processes.

Human resources

Synergy management will be mainstreamed across the JU's staff functions to ensure continuity, flexibility, and ownership. The current staffing level—comprising the Head of Operations, Project Officers, Synergies Officer, Stakeholder Relationship Officer, Knowledge Management Officer, and Communications Team—provides the foundation needed to implement the coordination framework.

To improve efficiency, the JU will need to:

- strengthen collaboration between the Synergies Officer, Project Officers, Stakeholder Relationship Officer and Knowledge Management and Communications Teams through structured workflows and joint review meetings
- ensure synergy-related tasks are included in staff work plans to formalise ownership
- ensure that the time dedicated to synergy activities remains proportionate to staff workload and operational priorities, allowing for flexible allocation of effort across roles as needed
- allocate temporary or part-time support (e.g. trainees or short-term assistants) for data collection or event coordination when needed

While early internal estimates suggest that synergy coordination could represent a limited share of overall staff time, exact allocations will depend on the annual work programme, call planning cycles, and the number of ongoing synergy initiatives.

Financial resources

The JU will continue to finance synergy-related activities under its administrative and operational budget, following its Financial Rules. Rather than establishing a dedicated "synergies" budget line, the synergy coordination framework will allow flexible use of available funds to:

- strengthen inter-institutional coordination (e.g. workshops, joint calls, bilateral meetings)
- support visibility and dissemination actions, including content development and event participation, and
- leverage digital and data tools that enhance knowledge sharing and collaboration (e.g. Knowledge Hub functionalities).

Budgetary planning for synergy activities will be integrated into the Annual Work Programme (AWP) and yearly budget cycle, with adjustments overseen by the Head of Operations to ensure proportionality between ambition and available resources.

Technical and digital capacities

The JU will rely on digital systems to coordinate and monitor synergies efficiently, building on existing platforms:

- The Clean Hydrogen Knowledge Hub will serve as the internal workspace for coordination and access to synergy-related materials
- The European Hydrogen Observatory will function as the public-facing platform for visualising synergy outputs
- The Communications Team will work with the Knowledge Management function to ensure outputs are presented in a coherent and accessible way.

All synergy-related data will comply with the JU's Data Protection and Privacy Policy, ensuring secure handling and controlled access.

Capacity-building, communication and internal learning

To ensure that synergy management becomes a sustained and collective practice, the JU will foster an internal culture of collaboration, continuous learning, and transparent communication. Capacity building will not only focus on technical know-how but also on creating shared understanding and coordination habits across teams and governance levels.

Internal capacity-building and collaboration mechanisms will include:

- **Quarterly "Synergy Roundtables"** for joint progress reviews of synergy activities
- **Training sessions** on synergy tools, data, and communication practices, and
- **Peer learning** among staff to strengthen identification, coordination, and reporting skills
- **A "You Said / We Did" feedback mechanism** will be maintained to communicate to SG and SRG how their inputs were reflected in JU's actions, strengthening trust and accountability.

Communication and external engagement will be embedded as part of this collaborative approach, rather than treated as a downstream dissemination activity.

- The **Communications Team**, in close cooperation with the Synergies Officer and Knowledge Management Officer, will translate synergy outcomes into coherent, accessible, and visually engaging materials.
- Events such as the **European Hydrogen Week**, **Hydrogen Valleys Days**, and the **European Partnership Stakeholder Forum** will continue to serve as high-level opportunities for showcasing results, fostering dialogue, and enhancing visibility of joint achievements.

3.4.4 Management tools and processes

The Clean Hydrogen JU will employ a mix of formal and operational tools to ensure consistency, traceability, and scalability in synergy management.

Formal cooperation instruments

Formal cooperation instruments will remain central to structuring strategic and inter-institutional synergies. They establish clarity on objectives, roles, and expected outcomes while providing legal and procedural stability.

MoCs will continue to structure cooperation with national and regional Managing Authorities, aligning Cohesion and R&I investments. The existing MoC template will serve as the basis for future agreements, but minor adaptations may be introduced to:

- better link MoC focus areas to the SRIA pillars and the typology of synergies (programmatic vs implementation-level)
- include performance indicators and milestones for follow-up and
- ensure alignment with the new Synergy Coordination Framework and reporting templates.

MoUs will be used to structure and formalise cooperation with other European Partnerships and Executive Agencies. Based on successful examples such as the Clean Hydrogen JU-CAJU MoU, these documents should specify the scope of cooperation, division of responsibilities, information-sharing modalities, and the expected added value for each partner.

Both will be managed by the Synergies Officer in coordination with the Legal and Operations Units and recorded in the Synergy Register for traceability.

Operational templates and tools

To ensure consistency, traceability and comparability across synergy activities, the JU will use a set of structured templates that align with each stage of the synergy coordination framework:

- **Synergy Brief:** a one-page intake form capturing essential information on the potential partner, SRIA alignment, expected benefits, and resource implications.
- **Synergy Prioritisation Checklist:** a semi-quantitative tool to be used by the Synergies Officer and Project Officers to assess relevance, feasibility, and alignment with JU priorities. It will support decision-making by the Head of Operations or Executive Director.
- **Synergy Register:** a living database consolidating all synergy opportunities, formal collaborations, and ongoing actions. It will include metadata such as partnership type, expected outputs, start and end dates, and responsible officers.

- **Synergy Progress Template:** a concise quarterly report used by Project Officers to monitor progress, identify challenges, and propose corrective measures.
- **Annual Synergies Highlights Report:** a short document consolidating annual results, feeding into JU's KPI framework and annual reporting process.
- **Synergy Presentation Template (PPT)**: a standardised format for reporting synergy progress and results to the Governing Board (GB), States Representatives Group (SRG), and Stakeholders Group (SG), ensuring coherent visual communication and comparability across reporting cycles.

The above tools could be complemented by lightweight digital solutions enabling real-time intelligence-sharing and coordinated action, such as the following:

- **Synergies Information Hub**: an online platform integrating the Synergy Register, MoC updates, funding calendar, advisory inputs (SG/SRG), Hydrogen Valleys data and key knowledge platforms (Hydrogen Observatory, H2V.eu, Knowledge Hub).
- **Synergy Dashboard & Landscape Tracker**: a visual interface showing quantitative (joint calls, co-funded projects, TRL transfers) and qualitative (MoC insights, advisory feedback, regional intelligence) indicators, supporting evidence-based decision-making and preparation of future European R&I funding programmes.
- **Joint Funding Calendar Tool**: a continuously updated overview of national, regional and EU call schedules (HE Partnerships, CEF, Innovation Fund, RRF), used during Call Calendar Dialogues to **synchronise programming cycles**.
- **MAs Community Space**: a shared workspace for MAs to submit annual progress reports, exchange good practices, regulatory solutions and co-funding opportunities.
- **Global Synergy Tracker** – an extension of the dashboard to monitor cooperation with CHM, IPHE and bilateral partners, capturing joint roadmaps, international KPIs and replication outcomes.

Together, these tools will establish a clear management trail for all synergy activities, reduce duplication of effort, and support internal learning by allowing systematic aggregation and analysis of data across programmes and years.

The proposed Synergy Management model provides the Clean Hydrogen JU with a coherent and forward-looking operational framework to translate strategic ambitions into measurable, sustained collaboration outcomes. By combining clear governance principles with proportionate resource allocation and structured management tools, the JU will be equipped to identify, prioritise, and manage synergies in a systematic and transparent way. The integration of data-driven knowledge management, internal coordination mechanisms, and formalised reporting processes will ensure that each synergy contributes meaningfully to JU's mission and the broader EU policy landscape.

Ultimately, this framework establishes the foundation for an adaptive and learning-based approach to cooperation—one capable of evolving with the next Multiannual Financial Framework and supporting the continued growth and impact of Europe's hydrogen ecosystem.

3.5 Monitoring, reporting, and continuous improvement

3.5.1 KPI Framework

A robust Key Performance Indicator (KPI) framework is central to the Clean Hydrogen JU's capacity to monitor, assess, and communicate progress in implementing its Synergies Strategy. As the JU evolves within the Horizon Europe framework (2021-2027) and prepares for future programming periods, the need to better measure the performance and impact of synergies has become critical.

The current KPI architecture, shared across all Horizon Europe Joint Undertakings, includes both **common indicators** (e.g. KPI-2, KPI-8, KPI-9, KPI-10) and Clean Hydrogen JU**-specific indicators** (e.g. KPI-9 "Research and Innovation Synergies" and KPI-13 "Promoting cross-sectoral solutions"). While this framework provides a foundation for measuring cooperation, it has under-captured the qualitative, knowledge-based, and governance dimensions of synergies. Building on lessons learned, the improved framework aims to strengthen the link between data, performance, and learning—ensuring that synergies are both measurable and strategically managed.

3.5.1.1 Current KPI framework and areas for improvement

The Clean Hydrogen JU's existing KPI framework, as implemented through the SRIA, already includes indicators that indirectly capture synergy performance. KPI-2 measures *additional investments triggered by the EU contribution*, covering both quantitative and qualitative leverage effects. KPI-8, KPI-9, and KPI-10 address *coherence and synergies*, tracking the number and type of joint activities with other partnerships and initiatives, as well as complementary funding mobilised from other EU and national instruments. The JU's own KPI-9 measures *research and innovation synergies* with external programmes, while KPI-13 focuses on *cross-sectoral solutions*.

Lessons learned from recent reporting cycles and stakeholder consultations highlight both progress and persistent gaps:

- **Fragmented data landscape**: Information on synergy activities and outcomes is dispersed across project reports, tenders, and knowledge management outputs, including external platforms. The lack of a centralised synergy database prevents longitudinal analysis and consistency.
- **Informal coordination**: Collaboration across JU units and with external partners often relies on individual initiative rather than institutional workflows or shared tools.

- **Limited knowledge capture & qualitative underrepresentation**: Current KPIs measure activity counts and co-funding amounts but overlook the *depth, quality* and *impact* of knowledge exchanges, policy alignment, and interoperability outcomes.
- **Reactive knowledge management**: Data exchange and reporting often occur in response to external demands (e.g. from DG RTD or JRC), rather than as part of a proactive monitoring cycle.

3.5.1.2 Synergies KPI framework – potential refinements

Building on existing Horizon Europe indicators and recent methodological updates, a refined KPI framework is proposed to strengthen the monitoring of synergy activities and impacts. The framework retains alignment with Horizon Europe's common KPIs but introduces targeted **synergy-specific dimensions** and **qualitative indicators**. It also establishes a clearer link between inputs, processes, and outcomes within the JU's broader monitoring logic.

Proposed synergy-related KPIs

(The following KPIs are illustrative and adaptable to future implementation guidelines)

Inputs and Processes

- **KPI-S1:** Number and type of formal cooperation mechanisms established (e.g. MoC/MoU, Letters of intent, joint work programmes, shared governance or data protocols).
- **KPI-S2:** Proportion of annual JU budget aligned or co-programmed with other EU or national instruments (e.g. ERDF, RRF, Innovation Fund).
- **KPI-S3:** Number and type of structured coordination activities (e.g. joint steering meetings, knowledge-exchange workshops).

Outputs and Outcomes

- **KPI-S4:** Number and type of joint or coordinated funding actions launched per year (calls, tenders, or studies).
- **KPI-S5:** Volume of complementary or cumulative funding mobilised from other programmes (as % of JU operational budget).
- **KPI-S6:** Number of co-funded or sequentially funded projects reaching higher TRL levels through synergy mechanisms.
- **KPI-S7:** Stakeholder perception of synergy effectiveness and added value (survey-based or interview-based index).

Together, these indicators will allow the JU to monitor both the **breadth** (number and coverage) and the **depth** (quality and outcome) of its synergy activities, strengthening the link between operational collaboration, knowledge management, and systemic outcomes. They will also allow the JU to assess the maturity of its synergy ecosystem—from ad hoc cooperation to institutionalised coordination supported by data-driven governance.

3.5.1.3 Implementation and outlook

To operationalise the revised KPI framework, the Clean Hydrogen JU should establish an integrated **Synergies Monitoring Module** within its Knowledge Management System. This would consolidate datasets from programme, communication, and stakeholder engagement units, and include a **"CRM for synergies"**—a registry of partner organisations, cooperation activities, and results, allowing for consistent tagging, reporting, and visualisation of synergy activities.

Governance-wise, a cross-unit **Synergy Coordination Cell**, led by the **Synergies Officer** and supported by the **Knowledge Management Officer**, should oversee data integrity, reporting coherence, and KPI updates. Standardised metadata, reporting templates, and dashboards—aligned with the JRC's monitoring protocols and Horizon Europe evaluation standards—should enable real-time tracking of synergies.

In the next programming period, synergy-related KPIs should be embedded from the **design phase of Annual Work Programmes and project reporting templates**, ensuring that projects systematically report on synergy outcomes and enabling longitudinal tracking. The framework should also remain flexible to incorporate emerging policy priorities—such as hydrogen's role in **strategic autonomy, industrial resilience, and the clean-tech manufacturing base**. Over time, this will transform JU's monitoring culture—from reactive compliance to proactive learning.

Ultimately, this improved KPI framework will help the Clean Hydrogen JU not only **demonstrate accountability and performance** but also **learn strategically from its partnerships**—turning synergies from ad hoc cooperation into a measurable driver of innovation, investment, and systemic impact.

3.5.2 Feedback and review mechanisms

The effectiveness and long-term relevance of the Synergies Strategy will depend on the capacity of the Clean Hydrogen JU to monitor its implementation, integrate feedback from its internal and external partners, and adapt to evolving priorities and contexts. This section outlines the mechanisms through which the JU will systematically gather, assess, and act upon feedback from its internal bodies and key external stakeholders. These mechanisms aim to strengthen the

coherence, efficiency, and transparency of synergy-related activities across the JU, while ensuring that lessons learned are continuously translated into strategic and operational improvements.

The feedback and review framework proposed here builds on existing internal practices and governance arrangements, including triannual JU advisory body meetings, the JU's Annual Activity Report (AAR) cycle, and regular coordination among Units. The introduction of an improved KPI framework will further strengthen this system, linking performance data with qualitative learning to enable evidence-based management.

3.5.2.1 Strategy review cycle

The Strategy Review Cycle provides the overarching rhythm through which the Synergies Strategy is evaluated, updated, and aligned with the JU's evolving strategic priorities and broader EU policy developments. It ensures that the Strategy remains a living framework—periodically refined considering experience, stakeholder input, and contextual changes in the hydrogen ecosystem.

The review cycle will operate at three complementary levels.

A. **Continuous and informal reviews** will take place through regular coordination within and across Units, where synergies are discussed as part of ongoing portfolio management. These sessions provide real-time opportunities to assess progress, identify emerging opportunities or bottlenecks, and adjust ongoing activities as needed.
B. **An annual structured review** will summarise progress and lessons learned in a concise internal Annual Synergies Highlights Report. This document, coordinated by the SO and the responsible officers, will draw on inputs from the Synergies Register, internal coordination meetings, and feedback from the SG and SRG. It will inform both the AAR and upcoming Work Programmes. It will also integrate KPI-based evidence from JU's monitoring system, connecting quantitative performance with qualitative insights from stakeholder feedback.
C. **A multi-annual review** will occur in alignment with key milestones of the Multiannual Work Programme and the SRIA, helping prepare for the next strategic cycle beyond 2027. This higher-level review will allow the JU to assess the aggregate impact of its synergies activities, validate the relevance of its strategic focus areas, and identify new opportunities for collaboration across programmes and policy domains.

Together, these three levels form a coherent review continuum—combining flexibility and institutional accountability—ensuring that synergies remain strategically managed, aligned with the JU's mandate, and responsive to changing external environments.

3.5.2.2 Feedback mechanisms and learning loops

Internal feedback mechanisms

The Clean Hydrogen JU will establish a set of complementary feedback channels connecting day-to-day learning with strategic reflection. These mechanisms will combine staff experience, advisory input, and structured intelligence from Member States to ensure that insights are systematically captured and used to inform decision-making.

At the **operational level**, existing coordination practices—such as Unit briefings, portfolio discussions, and cross-team exchanges—will be strengthened and formalised through simple shared tools. Short templates or dashboards hosted on SharePoint or Teams will be used to record progress, lessons, and cooperation outcomes. POs and the HoO will periodically review this information, using it to guide planning and coordination. Over time, selected insights will be integrated into the Clean Hydrogen Knowledge Hub, supporting institutional learning and knowledge continuity.

At the **strategic level**, the SG and SRG will provide structured advice and feedback to the JU on the implementation of the Synergies Strategy. Their biannual meetings will serve as high-level reflection points, allowing the JU to align activities with stakeholder expectations, national policy developments, and emerging cooperation opportunities. Their inputs will be summarised in concise feedback notes, shared internally and integrated into the Annual Synergies Highlights Report.

A key element of this process will be the **SRG Annual Report on National and Regional Policies for Hydrogen**, which compiles updates on hydrogen strategies, funding schemes, and national priorities. The JU will work with the SRG to **transform this report into a forward-looking programming tool** that informs the preparation of Annual Work Programmes. Earlier data collection and a harmonised reporting format—structured around policy developments, funding instruments, emerging priorities, and synergy opportunities—will enable timely and comparable inputs. The introduction of a concise mid-year update and a short executive summary highlighting key trends and opportunities will further strengthen the report's value for Governing Board discussions and strategic planning.

Through this integrated feedback system—combining operational learning, advisory input, and national intelligence—the JU will ensure that information flows efficiently across levels, supporting evidence-based decision-making while keeping the process lean, proportionate, and strategically focused.

External partner feedback integration

In addition to internal governance mechanisms, the JU will rely on structured exchanges with external partners to identify alignment opportunities, monitor cooperation effectiveness, and suggest improvements to strategic orientation. This will include cooperation with national and regional **MAs** that have signed or are considering Memoranda of Cooperation, **flagship and Hydrogen Valley projects**, and institutional counterparts such as **other European Partnerships and EC executive agencies**.

Feedback from these actors will be collected through existing coordination channels, notably during the implementation of Memoranda of Cooperation and participation in synergy-related events. Biannual or thematic exchanges will allow partners to share updates on policy alignment, regional innovation priorities, and implementation progress. In addition, targeted consultations or short online surveys will be used to gather feedback in the lead-up to major strategic updates or the development of new initiatives.

All feedback will be captured through concise, structured formats, ensuring that inputs are actionable and can be easily integrated into JU's internal review cycles. Over time, a digital feedback feature integrated into the **Clean Hydrogen Knowledge Hub** or the **European Hydrogen Observatory** will facilitate systematic data collection, enabling real-time synthesis of stakeholder insights and strengthening transparency across the JU's cooperation network. These qualitative inputs will complement quantitative KPI data, ensuring a balanced assessment of synergy performance across both operational and strategic dimensions.

3.5.2.3 Annual synergies reporting model

Systematic reporting plays a vital role in consolidating feedback, assessing performance, and ensuring institutional learning. The JU's annual reporting model for synergies will be designed to complement existing obligations and workflows, drawing on the structure of the Annual Activity Report and on established internal monitoring practices.

Each year, the JU will produce a concise **Annual Synergies Highlights Report**, which will synthesise key developments, results, and lessons from synergy-related activities. This report could form either a distinct subsection of the Annual Activity Report or a short standalone annex shared with the Governing Board and the Commission. It will include:

- A narrative overview of synergy initiatives implemented during the year
- Highlights of cooperation with regions, European Partnerships, and EU bodies
- Qualitative insights from stakeholder feedback (SG, SRG, MAs, projects)
- Key findings from the SRG Annual Report on National and Regional Policies for Hydrogen

- Quantitative evidence drawn from the KPI framework, assessing both the breadth (number and scope) and the depth (quality and outcome) of its synergy activities
- Key challenges and planned mitigation measures
- Forward-looking recommendations for the next planning cycle

Where relevant, the summary will refer to performance indicators described in the **Monitoring and KPI framework**. The structure will remain concise and visual, favouring clarity and accessibility.

To enhance efficiency, reporting inputs will largely draw from existing internal tools and meeting outputs—such as internal feedback templates, and minutes from stakeholder consultations—avoiding any duplication of effort. This synthesis will feed into the Governing Board's annual discussions, ensuring that feedback directly informs the next planning cycle. Over time, these reporting elements could feed into the Knowledge Hub or the Hydrogen Observatory, allowing broader dissemination of good practices and success stories, while maintaining confidentiality where required

3.5.2.4 Continuous improvement and adaptive management

The Synergies Strategy will embed a principle of continuous improvement and adaptive management, ensuring that insights from feedback and reviews translate into concrete strategic and operational adjustments.

At the strategic level, findings from annual and multi-annual reviews—consolidated through the Annual Synergies Highlights Report—will inform discussions within the JU's executive and advisory bodies. These reflections will be supported by data from the KPI framework, enabling evidence-based adjustments to priorities, focus areas, and resource allocation. This adaptive process will keep the Clean Hydrogen JU's synergies approach aligned with evolving EU policies and responsive to new partnership opportunities.

At the operational level, adaptive management will be supported by a suite of structured **templates and tools**—including the *Synergy Brief*, *Synergy Prioritisation Checklist*, *Synergy Register*, and *Synergy Progress Template*. These instruments will enable systematic tracking, comparability, and aggregation of information across activities, facilitating evidence-based decision-making and continuous learning.

The Clean Hydrogen JU will also promote a learning-by-doing culture, using feedback from implemented activities to improve subsequent initiatives. Simple practices such as short lessons-learned notes, cross-team debriefs, or reflection sessions will support institutional learning, complemented by light tools like internal peer reviews or dashboards tracking cooperation trends.

By capitalising on existing structures and digital platforms, the JU will maintain a lean, adaptive feedback system that strengthens the impact, agility, and sustainability of its synergies activities.

4 Conclusions

The Clean Hydrogen JU has established a solid foundation for fostering synergies across the research and innovation landscape at European, national, and regional levels, positioning itself as a **strategic focal point in the European hydrogen ecosystem**. Through its institutionalised status under Horizon Europe, it has demonstrated its capacity to cooperate with a wide range of actors, including other institutionalised, co-programmed and co-funded HE European Partnerships, EC executive agencies, EU initiatives, regional and national authorities and international organisations. The implementation of flagship initiatives such as Hydrogen Valleys and the engagement of Managing Authorities through MoCs represent tangible evidence of progress in promoting multi-level collaboration and territorial deployment of hydrogen solutions. These efforts confirm that **synergies are not just complementary activities but a strategic enabler for achieving the Clean Hydrogen JU's objectives** as well as those of its private and public members, enhancing competitiveness, accelerating market deployment and supporting the Union's climate targets.

At the same time, the assessment undertaken through this Strategy highlights that **the overall synergies ecosystem in which the Clean Hydrogen JU operates remains fragmented, unevenly developed and only partially institutionalised**. Integration of funding instruments across programmes and governance levels is still at an early stage and operational coordination mechanisms are inconsistently applied. In most cases, synergies continue to materialise through project-specific or bilateral collaborations, with systemic or institutional embedding limited to certain structured initiatives, such as the MoCs with national and regional Managing Authorities, collaboration with other Joint Undertakings (e.g. CAJU, ZEWTP), or structured multi-level initiatives like Hydrogen Valleys. This indicates that, although the Clean Hydrogen JU's contribution to the European hydrogen value chain is substantial, the full potential of multi-level, cross-programme synergies – particularly those involving national and regional authorities and combining different funding sources – has yet to be fully realised.

The current situation can therefore be characterised by both progress and opportunity. On the one hand, the Clean Hydrogen JU has developed valuable experiences, processes, and partnerships—especially in aligning its activities with other Horizon Europe Partnerships and in bridging research and deployment through instruments such as the EIC programmes (e.g. EIC Pathfinder and Transition funding programmes), Innovation Fund, and Cohesion Policy funds. On the other hand, several structural and procedural gaps persist, particularly regarding systematic identification and prioritisation of synergy opportunities, cross-programme monitoring, and the establishment of formal coordination mechanisms with EU, national and regional counterparts. To meet the obligations of the **Single Basic Act** which requires all Joint Undertakings to "seek and maximise synergies" with other EU, national and regional initiatives to optimise impact, efficiency, and

coherence of public investment and to fully deliver on its **Strategic Research and Innovation Agenda 2021-2027**, the Clean Hydrogen JU must evolve from ad hoc collaboration to an integrated and proactive synergy management approach.

Moving forward, the JU should consolidate its role as the **central orchestrator of hydrogen-related synergies** in Europe. This requires embedding a **structured synergy management system** within its governance and operational architecture. Clear roles, responsibilities and processes for identifying, assessing, prioritising and monitoring synergies should be established, ensuring that collaboration becomes a systematic function rather than an opportunistic endeavour. Synergies should be integrated into annual work programme preparation, strategic planning, reporting cycles and performance monitoring under the KPI framework. This will enhance accountability, avoid duplication of efforts and ensure alignment with wider EU policy objectives and funding mechanisms.

Replicating and scaling successful cooperation models will be essential to accelerate progress. The MoC framework with Managing Authorities, the multi-level collaboration within Hydrogen Valleys, and the cooperation with other Joint Undertakings provide replicable templates for structured coordination, shared funding and alignment of strategic priorities. These models should be adapted and extended to new regions and actors, supported by a knowledge repository of good practices, case studies and practical guidance. In doing so, the JU can support territorial deployment while strengthening its network of committed partners.

To ensure the sustainability and credibility of its synergy agenda, the Clean Hydrogen JU must also develop a **robust monitoring, learning and adaptation system**. A dedicated mechanism to track synergy activities, measure added value and inform future adjustments should be closely linked to evaluation cycles and performance indicators. Periodic reviews, aligned with Work Programme updates, should assess which collaborations deliver strategic impact and which require reorientation. Feedback loops involving partners and stakeholders will create a culture of continuous improvement and ensure responsiveness to evolving technological, regulatory and market dynamics.

Looking ahead, **strategic alignment with evolving European policies and funding frameworks** will be crucial. The Clean Hydrogen JU should proactively engage in cross-programme initiatives related to REPowerEU, the Green Deal Industrial Plan, the Net-Zero Industry Act and preparations for the next Multiannual Financial Framework (2028–2034). Strengthening its communication and visibility on synergies will further consolidate its position as a catalyst for coordination across the hydrogen value chain. Internally, future updates of the SRIA and strategic evaluations should reflect synergy priorities, ensuring they remain at the core of the JU's mission.

This **Synergies Strategy** should be treated as a **living framework** that evolves alongside the European R&I and industrial landscape. In the short term, priority should be given to operationalising the synergy management framework, expanding structured partnerships and embedding monitoring into regular processes. In the medium to long term, the JU should explore deeper institutional cooperation mechanisms with other JUs and executive agencies, including joint actions, shared governance models or co-funded initiatives where appropriate. By systematically embedding synergies into governance, operations and strategic foresight, the Clean Hydrogen JU will not only comply with its legal mandate but also enhance its strategic relevance and impact in Europe's clean energy transition.

By consolidating its position as **Europe's coordination and knowledge hub for hydrogen synergies**, and by shifting from fragmented initiatives to an integrated, proactive and learning-oriented approach, the Clean Hydrogen JU can unlock the full value of multi-level collaboration. This will enable it to drive innovation, strengthen competitiveness, and support a coherent, efficient and territorially inclusive hydrogen ecosystem for the years to come.

5 Roadmap

This roadmap translates the synergy priorities identified in Section 3.3 (Strategic synergy priorities) into concrete, implementable actions for the Clean Hydrogen JU. It provides a structured plan to move from ad hoc cooperation to a systematic, measurable approach to synergies. Actions are organised across four clusters (in line with those identified in Section 3.3) and specify for each priority the objective, timeframe, action, key actors and expected impact. The roadmap serves as a practical implementation tool to embed synergies into JU governance, programming and project delivery, while positioning it as a strategic hub for hydrogen cooperation in Europe and globally.

A. Strategic intelligence, governance & coordination of synergies

The following table translates Cluster A priorities into concrete actions to formalise synergy governance, improve strategic steering and embed structured intelligence across the JU's operations

Table 6: Actions to strengthen Clean Hydrogen JU synergy governance & intelligence

Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
Establish formal governance of synergies	A1. Structured and accountable synergy governance system	Short-term	Approve and operationalise the Synergy Coordination Framework (intake–assessment–decision–follow-up)	Executive Director, Head of Operations, Synergies Officer, Project Officers, Stakeholder Relationships Officer, Knowledge Management Officer	Clear process and accountability for managing synergies
		Short-term	Implement RACI structure defining roles across Programme Office, Advisory Bodies, GB	Head of Operations, Synergies Officer, Project Officers, Stakeholder, Knowledge Management Officer,	Reduced person-dependency; institutional clarity

Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
				Communications Officers	
		Short-term	Embed synergy objectives in Annual Work Programmes, staff objectives and resource allocation	Head of Operations, Synergies Officer, Project Officers, Stakeholder, Knowledge Management Officer	Institutional continuity; sustained ownership and resource allocation
Strategic steering via intelligence & foresight	A2. Strategic intelligence, foresight & regulatory insight	Short-term	Develop and deliver consolidated synergy intelligence briefs to GB, summarising SG/SRG/MoC/other EU initiatives/international partner intelligence	Executive Director, Head of Operations	GB becomes proactive steering body; evidence-based decisions on AWP and synergies
		Long-term	Institutionalise foresight exercises on technology trends, supply chains, infrastructure, skills	SG, SRG, External experts[16]	Forward-looking Work Programme design
		Short-term	Launch structured dialogues with DG COMP, DG ENER and national regulators on state aid & multi-source funding barriers	Executive Director, Head of Operations, Synergies Officer, DG COMP, DG ENER, SRG	Reduced regulatory uncertainty, better funding uptake
	A3. Systematise SG & SRG engagement	Short-term	Introduce early SRG/SG involvement in AWP pre-	Stakeholder Relationships Officer,	Shift from reactive to co-design participation

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Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
Make advisory bodies strategic co-creators			scoping via annual consultation calendar	Synergies Officer, Head of Operations	
		Short-term	Implement "You Said / We Did" feedback mechanism for feedback accountability	SRG, SG, Stakeholder Relationships Officer, Synergies Officer, Head of Operations	Greater trust and accountability
		Short-term	Organise joint SG–SRG thematic sessions (e.g. on hydrogen valleys)	SG, SRG, Stakeholder Relationships Officer, Synergies Officer, Head of Operations	Integrated industrial-national perspectives
		Short-term	Redesign SRG Annual Report as a forward-looking territorial intelligence tool	SRG (secretariat)	National/regional insights directly inform programming
Embed territorial intelligence into governance	A4. Integrate MA–MoC networks	Short-term	Introduce annual MoC work plans and focal points for each MA	Stakeholder Relationships Officer, Synergies Officer, Knowledge Management Officer, MAs (MoC Partners)	Structured implementation of MoCs
		Short-term	Introduce annual MoC synthesis reports, feeding SG/SRG/GB discussions and work	Stakeholder Relationships Officer, Synergies Officer, MAs (MoC Partners)	Territorial intelligence informs AWP
		Long-term	Create a digital "MA-MoC Community of Practice" platform for shared practices	Stakeholder Relationships Officer, Knowledge Management Officer, Communications Officers, MAs (MoC	Continuous knowledge-sharing across regions and coordination

Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
				Partners), External experts[17]	
	A5. External cooperation frameworks	Short-term	Develop flexible templates for MoUs and joint calls with key partners, as well as for follow-up reporting	Legal Officer, Synergies Officer, Head of Operations	Consistency and faster replication of the cooperation setup
Enhance early-stage intelligence flows	A6. Upstream intelligence	Short-term	Create "theme windows" for early inputs from EERA, SG, SRG in AWP pre-scoping	SG, SRG, EERA, Stakeholder Relationships Officer, Synergies Officer	Early capture of low-TRL research trends to inform JU call design
		Short-term	Formalise SRG–SET Plan TWG/IWG interface on Valleys, skills, circularity	SRG, Stakeholder Relationships Officer, Synergies Officer, Head of Operations, SET Plan	National–EU alignment on hydrogen priorities
		Short-term	Align the timing of the European Clean Hydrogen Alliance's annual survey with the JU AWP preparation cycle so that industry pipeline data can inform topic selection	European Clean Hydrogen Alliance, Synergies Officer, Head of Operations	AWP topics better reflect industry needs and market reality, improving relevance and uptake of JU calls
Build data backbone & shared tools	A7. Knowledge systems & dashboards	Short-term	Use Hydrogen Observatory, Knowledge Hub, H2V.eu as shared intelligence tools	Knowledge Management Officer, Communications Officers, External experts[18]	Increased data interoperability & shared learning

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Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
		Long-term	Develop digital Synergies Information Hub mapping ongoing/planned synergies	Knowledge Management Officer, Communications Officers, Synergies Officer, External experts[19]	Centralised repository for synergy activities, facilitating traceability and transparency
		Long-term	Launch Synergy Dashboard (KPIs, MoC performance, advisory body inputs, co-funded projects) for synergy management, monitoring and preparation for the next EU R&I Funding Programme	Knowledge Management Officer, Communications Officers, Synergies Officer, External experts[20]	Real-time visibility of synergies; data-driven decisions and progress tracking
Enable evidence-based adaptation	A8. Monitor & evaluate synergy landscape	Long-term	Launch Synergy Landscape Tracker (quantitative + qualitative intelligence)	Synergies Officer, Project Officers, Stakeholder Relationships Officer, Knowledge Management Officer, External experts[21]	Full visibility of evolving synergy ecosystem
		Long-term	Establish annual and mid-term synergy strategy review cycles, feeding AWP & EU R&I Funding Programme preparations	Head of Operations, Synergies Officer, Project Officers, SG, Stakeholder Relationships Officer, Knowledge	Adaptive governance and continuous improvement

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[21] Given the current resource capacity of the Clean Hydrogen JU, it may be necessary to have this work or parts of this work executed by external experts or contractors

Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
				Management Officer, SRG, External experts[22]	
		Long-term	Conduct periodic gap analyses to identify missed opportunities	Head of Operations, Synergies Officer, External Experts[23]	Proactive identification of new synergy areas

B. Cross-Partnership & Cross-Programme Alignment

The actions below operationalise Cluster B priorities by strengthening structured cooperation with other partnerships and funding programmes, aligning programming cycles and creating innovation-to-deployment funding pathways.

Table 7: Actions for cross-Partnership and cross-Programme alignment

Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
Institutionalise light, flexible cooperation	B1. Cooperation frameworks with HE Partnerships & EU programmes	Short-term	Replicate the Clean Hydrogen JU–CAJU MoU model with key partners such as EU-Rail, CETP, 2Zero, CINEA and EISMEA; define joint priorities, liaison roles, cadence, and data protocols.	Executive Director, Head of Operations, Legal Officer, Synergies Officer, EU-Rail, CETP, 2Zero, CINEA, EISMEA	Formalised, scalable cooperation; predictability beyond person-to-person links.

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Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
		Short-term	Stand up two-tier coordination with each strategic counterpart: Programmatic tier (biannual alignment on topics/foresight/studies) + Operational tier (PO-level data sharing, project mapping, standardisation & comms).	Head of Operations, Synergies Officer, Project Officers, Partner Project Officers	Continuous alignment at strategy and delivery levels; faster issue resolution.
		Short-term	Use a modular MoU/MoC template (light annexes per partner) to ease replication and updates.	Legal Officer, Synergies Officer	Reduced setup time; consistent quality.
		Long-term	Annual review of each cooperation framework/mechanism's effectiveness (agenda delivery, actions closed, outcomes/impact).	Head of Operations, Synergies Officer, Project Officers, Knowledge Management Officer, External experts[24]	Scale decisions based on evidence.
Create a structured innovation-to-deployment pipeline	B2. EIC → Clean Hydrogen JU → IF/CEF pathway	Short-term	With EIC/EISMEA, jointly map hydrogen-relevant EIC projects; nominate transfer candidates to upcoming Clean Hydrogen JU calls	Synergies Officer, EIC/EISMEA, DG GROW, Project Officers	Visible pipeline of innovations ready for higher-TRL funding.
		Long-term	With CINEA/CEF design handoff guidance for JU projects to deployment (TEN-T corridors, ports, valleys); publish a 2–3-page playbook.	Executive Director, Head of Operations, Synergies Officers, CINEA programme teams	Clear route from R&I results to infrastructure investment.

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Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
		Short-term	Use Hydrogen Valleys & multi-source flagships as demonstrators of blended funding; document 3–5 cases per year.	Project Officers, Valley coordinators, S3 Hydrogen Valleys Partnership	Replicable models; increased co-funded investments.
		Long-term	Establish a standing transfer check in AWP cycles (EIC→Clean Hydrogen JU→CEF/IF) with shared milestones and points of contact.	Head of Operations, Synergies Officer, Project Officers EIC/EISMEA, CINEA programme teams	Institutionalised pipeline continuity.
Align programming cycles & enable joint/complementary actions	B3. Programming cycle alignment & pilots	Short-term	Map partner programming cycles & call windows (CAJU, CETP, EIC, CINEA/CEF–IF) to identify complementary/sequenced funding slots.	Executive Director, Head of Operations, Synergies Officer, Project Officers, CAJU, CETP, EIC/EISMEA, CINEA programme teams	Shared view of timing opportunities; fewer missed alignments.
		Long-term	Launch Annual Call Calendar Dialogue with DG RTD, DG REGIO, DG ENER, DG MOVE to synchronise programming cycles and early SRIA signalling.	Executive Director, Head of Operations, Synergies Officer, DG RTD, DG REGIO, DG ENER, DG MOVE, GB, SRG	Earlier alignment of EU funding programmes; fewer missed co-funding windows.
		Short-term	Pilot synchronised/joint actions (e.g., Clean Hydrogen JU–ZEWTP 2026 co-topic): joint scoping note, shared progress reviews, co-branding.	Project Officers, Synergies Officer, Legal Officer, Knowledge Management Officer, Communications Officers, Partner JUs	Proof of feasibility; trust and habits built.

Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
		Long-term	Scale pilots to 2–3 regular coordinated actions/year where added value is proven.	Executive Director, Head of Operations, Synergies Officer, Project Officers Partners' officers	Portfolio-level complementarity and leverage.
Build shared intelligence & interoperability	B4. Shared tools, indicators & data links	Long-term	Launch/expand a Synergies Information Tracker covering hydrogen-related projects supported by IF, CEF, RRF, MF, national/regional funds	Synergies Officer, Knowledge Management Officer, Project Officers, External experts[25]	Single view of EU hydrogen investments for gap/overlap analysis.
		Long-term	Link the Synergy Information Tracker with the Hydrogen Observatory and Knowledge Hub	Knowledge Management Officer, Synergies Officer, Communications Officers, External experts[26]	Better analytics; reduced duplication.
		Long-term	Agree shared indicators with partners (joint calls, co-funded projects, TRL transfers, infrastructure linkages) and display on a Synergy Dashboard.	Knowledge Management Officer, Synergies Officer, Communications Officers	Comparable performance; GB oversight enabled.
		Long-term	Introduce light data-sharing protocols to sustain interoperability.	Knowledge Management Officer, Legal Officer, Synergies Officer, Partners	Durable data flows; lower admin friction.
Strengthen joint communication &	B5. Joint visibility & political positioning	Short-term	Co-brand sessions with CAJU, ZEWTP, EU-Rail at Hydrogen	Communications Officers, Partner's	Unified EU narrative; higher policy salience.

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Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
visibility (strategic, optional)			Week, TRA, EU R&I Days to showcase end-to-end pathways.	communications teams	
		Short-term	Publish short success dossiers (Clean Hydrogen JU-supported projects → CEF infrastructure) with 1-page visuals; align press and social media kits.	Communications Officers, Project officers, CINEA communications team and project officers	Tangible proof of impact; stakeholder buy-in.
		Short-term	Use visibility to support next-MFF discussions for synergy instruments and coordinated calls.	Executive Director, GB	Political backing for sustained synergy funding/design.

C. Multi-level Territorial Cooperation

The following table turns Cluster C priorities into actions to institutionalise multi-level territorial coordination, enable blended funding and strengthen regional capacity and intelligence flows.

Table 8: Actions to enhance multi-level territorial cooperation

Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
Institutionalise multi-level coordination with MS/regions	C1. Strengthen & institutionalise coordination	Short-term	Formalise MoCs into multi-annual cooperation platforms with focal points, annual work plans and reporting duties.	Synergies Officer, Stakeholder Relationships Officer, MAs	Stable, accountable cooperation architecture with clear responsibilities.

Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
		Long-term	Establish Joint Funder Boards for Valleys/flagships to resolve State aid/eligibility in real time and align monitoring across EU/national programmes.	Synergies Officer, Project Officers, DG RTD, DG REGIO, DG ENER, DG MOVE, CINEA, MAs	Faster legal clarity; coordinated co-funding decisions and oversight.
		Short-term	Create permanent feedback mechanisms with MAs (linked to MoCs and SRG reporting) on regulatory bottlenecks and co-funding opportunities.	Synergies Officer, Stakeholder Relationships Officer, MAs, SRG	Continuous two-way feedback; quicker issue resolution.
Synchronise funding calendars & programming	C2. Calendar & cycle synchronisation	Long-term	Develop a digital hydrogen funding calendar, mapping EU/national/regional calls and reprogramming windows.	Knowledge Management Officer, Synergies Officer, Project Officers, Stakeholder Relationships Officer, External experts[27]	System-wide visibility; easier planning of blended pipelines.
		Short-term	Pilot soft calendar alignment/sequenced calls with willing Member States for Valleys/strategic industrial projects.	Synergies Officer, Project Officers, Stakeholder Relationships Officer, SRG, selected MS	First operational proofs of synchronised funding.
		Short-term	Use SRG/MoC platforms to pre-signal SRIA/AWP priorities before national calls are fixed.	Synergies Officer, Stakeholder Relationships Officer SRG, MAs	Integration of hydrogen into OPs/national and regional strategies/policies.

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Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
		Long-term	Feed Calendar Dialogue outputs into GB briefings and AWP preparation.	Head of Operations, Synergies Officer, GB, Executive Director	Strategic planning informed by coordinated timelines.
Enable layered & blended financing	C3. Tools, legal clarity & joint coordination	Long-term	Publish standard blending templates, eligibility checklists, and State aid guidance for combining HE, IF, CEF, ERDF, JTF, RRF.	Synergies Officer, Project Officers, Legal Officer, DG COMP, CINEA & parent DGs (DG REGIO, DG ENER, DG ENV, DG MARE, DG MOVE, DG REGIO, DG RTD)	Reduced admin burden; compliant, scalable blending.
		Long-term	Co-develop Synergy Guidance Notes on State aid, RFNBOs, permitting, double-funding safeguards.	Synergies Officer, Project Officers, Legal Officer, DG RTD, DG REGIO, DG COMP, External experts[28]	Shared reference; consistent practice across territories.
		Long-term	Use Joint Funder Boards to coordinate legal interpretations and joint monitoring of multi-source projects.	Synergies Officer, Project Officers, Legal Officer, MAs, DG REGIO, CINEA & parent DGs (DG REGIO, DG ENER, DG ENV, DG MARE, DG MOVE, DG REGIO, DG RTD)	Faster approvals; harmonised oversight.

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Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
		Short-term	Document & disseminate layered funding models (e.g., TRIERES, BalticSeaH_2) for replication.	Synergies Officer, Project Officers, Knowledge Management Officer, Communications Officers, coordinators of hydrogen valley projects	Replicable investment architectures; increased uptake.
Build administrative capacity & reduce disparities	C4. Capacity building & support	Long-term	Launch Hydrogen Academy territorial modules (blending, State aid, permitting).	Synergies Officer, Project Officers, Knowledge Management Officer, DG REGIO, Hydrogen Academy coordinator, External experts[29]	Up-skilled authorities; better project pipelines.
		Short-term	Provide PDA-style technical assistance to less-experienced regions for Valley design and co-funded portfolios.	Synergies Officer, Project Officers, MAs, External experts[30]	More bankable Valley proposals across EU.
		Long-term	Promote replication of high-performing regional models (e.g., FVG interdepartmental WG).	Communications Officers, Stakeholder Relationships Officer, SRG, MAs	Faster institutionalisation of good practices.
Institutionalise territorial intelligence & feedback	C5. Intelligence & feedback loops	Short-term	Create an SRG Regions Cluster linking SRG, MoC-MAs and S3 Hydrogen Valleys Partnership.	Stakeholder Relationships Officer, SRG, MAs, S3 Hydrogen Valleys Partnership	Dedicated channel for regional input into programming.

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Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
Use Hydrogen Valleys as replication engines	C6. Valleys & regional platforms	Short-term	Treat Valleys as living labs; capture lessons on financing, governance, permitting, demand; feed into FP10/regulatory innovation.	Synergies Officer, Project Officers, Knowledge Management Officer, Communication Officers, MAs, SRG	Evidence-based policy/regulatory adjustments.
		Long-term	Establish a Synergy Learning Network with DG REGIO & S3 Hydrogen Valleys Partnership.	Synergies Officer, Project Officers, DG REGIO, S3 H2V Partnership, External experts[31]	Peer learning; diffusion of effective governance models and good practices.
		Short-term	Use JU funding award/STEP Seal as a credibility signal for national/regional co-funding.	Synergies Officer, Project Officers, Knowledge Management Officer, Communication Officers, MAs, SRG	Increased investor/public authority confidence.

D. International Cooperation and Global Synergies

The actions below implement Cluster D priorities by formalising global partnerships, advancing bilateral technical cooperation and embedding international intelligence and governance within JU processes.

Table 9: Actions to strengthen international cooperation

[31] Given the current resource capacity of the Clean Hydrogen JU, it may be necessary to have this work or parts of this work executed by external experts or contractors

Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
Formalise structured international cooperation and avoid fragmented bilateral engagement	D1. Formalise strategic international alignment and shared priorities	Short-term	Co-develop joint international roadmaps (e.g. on Hydrogen Valleys, electrolysis, import corridors) with CHM/IPHE	Synergies Officer, Project Officers, Knowledge Management Officer, SG, SRG, CHM, IPHE, DG RTD, DG ENER, External experts[32]	Clear joint priorities and reduced duplication
		Short-term	Launch Annual International Synergy Dialogue (Clean Hydrogen JU–CHM–IPHE) to guide programming, update priorities and monitor progress	Executive Director, Head of Operations, Synergies Officer, Knowledge Management Officer, SRG, CHM, IPHE	Predictable platform for coordination and joint planning
		Long-term	Introduce shared global indicators (TRL maturity, Hydrogen Valley replication, infrastructure readiness) integrated into H2V.eu and JU dashboards	Head of Operations, Synergies Officer, Knowledge Management Officer, IPHE, CHM, JRC	Common metrics for monitoring and global benchmarking
Expand bilateral technical cooperation and international demonstrators	D2. Expand bilateral, project-based technical cooperation models	Short-term	Extend NEDO-style bilateral frameworks to new partners (e.g. Korea, Australia, Canada) with defined technical workstreams	Executive Director, Head of Operations, Synergies Officer, Legal Officer, Knowledge Management Officer, DG RTD, DG ENER, DG INTPA	Scalable and repeatable bilateral cooperation formats

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Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
		Long-term	Enable participation of non-EU partners in Hydrogen Valleys/demonstrators where legally feasible; include in call conditions or partnership clauses	DG RTD, DG ENER, DG INTPA, project coordinators	Increased global visibility and technical co-development in real projects
		Short-term	Use Hydrogen Week and thematic workshops as structured cooperation checkpoints with clear agendas, bilateral meetings and follow-up actions	Executive Director, Head of Operations, Synergies Officer, Communications Officers, NEDO, global partners	Hydrogen Week evolves from showcase to operational milestone for global cooperation
Integrate global regulatory and standards intelligence into EU programming	D3. Systematically integrate global regulatory and standards intelligence	Short-term	Assign JU focal points to IPHE task forces; establish biannual regulatory intelligence notes covering certification, safety, skills, permitting	Synergies Officer, Stakeholder Relationships Officer, SG & SRG (Heads), IPHE, DG ENER, DG MOVE	Global regulatory knowledge directly informs EU Work Programmes and avoids duplication
		Long-term	Develop joint guidance with IPHE/DG ENER on certification (RFNBO), safety requirements, permitting and skills alignment	Synergies Officer, Project Officers, Stakeholder Relationships Officer, SRG & SG, IPHE, DG ENER, DG MOVE	Shared guidance accelerates regulatory convergence and project implementation
Build global monitoring tools and ensure EU visibility	D4. Develop shared global monitoring, data and replication tools	Short-term	Co-design a Global Synergy Tracker: combine global KPIs (CHM/IPHE)	Knowledge Management Officer, Synergies Officer, IPHE, CHM, JRC, External experts[33]	Single reference tool for global replication and tracking of EU hydrogen leadership

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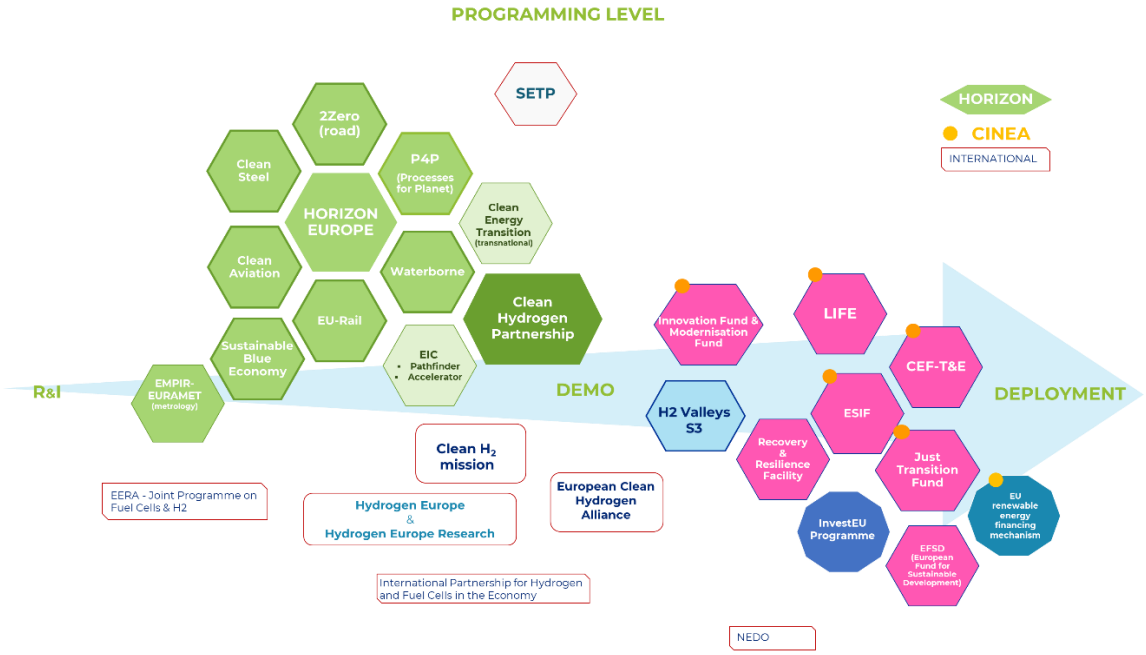
Strategic Objective	Synergy Priority (Section 3.3)	Timeframe	Action / Recommendation	Key Actors	Expected Outcome / Impact
			into H2V.eu and Synergy Dashboard		
		Long-term	Use global data to update SRIA, inform future European R&I Funding Programmes and international co-investment decisions	GB, Executive Director, Head of Operations, Synergies Officer, Project Officers, DG RTD, DG ENER, CHM, IPHE	Intelligence-driven future programming and strategic positioning of EU technologies
Embed international cooperation in governance and funding cycles	D5. Embed international cooperation into JU governance, funding cycles and project delivery	Short-term	Integrate international objectives and KPIs into AWPs, SRG/SG consultations and Governing Board updates	GB, Executive Director, Head of Operations, Synergies Officer, Stakeholder Relationships Officer, Knowledge Management Officer, SG, SRG	Institutionalisation prevents loss of momentum and ensures accountability
		Long-term	Require major projects (e.g. Hydrogen Valleys, flagship calls) to include international exploitation and knowledge transfer elements	Synergies Officer, Project Officers, Hydrogen Valley & flagship project consortia, DG RTD, DG ENER	Projects generate global spillovers, increasing EU influence and replication
		Long-term	Explore Global Gateway, EIB and NDICI funding for EU–third country co-investments in hydrogen corridors and Valleys	Executive Director, Head of Operations, Synergies Officer, SRG, DG RTD, DG ENER, DG MOVE, DG INTPA, EIB	Unlocks joint funding and positions EU as a global hydrogen investor

ANNEXES

A.1 Annex – Synergy mapping (extended version)



A.2 Annex – Synergy Management Tools

A.2.1 Synergy prioritisation framework

Table 10: Synergy prioritisation checklist template

Criterion		Guiding Questions	Scoring (1–5)	Weight	Weighted Score
1	**SRIA Alignment**	• Does the synergy directly support one or more SRIA pillars (Hydrogen Production, Storage & Distribution, End Use)? • Does it contribute to horizontal activities (e.g. Hydrogen Valleys, Hydrogen supply chains cross-cutting objectives such as safety, skills, or sustainability or strategic research challenges)?	**1 – Very Low:** No or marginal relevance to SRIA pillars. **2 – Low:** Indirect link; only partially related to current priorities. **3 – Moderate:** Clearly contributes to a SRIA pillar but not among key priorities. **4 – High:** Strong alignment with one or more SRIA pillars and JU work programme topics. **5 – Very High:** Fully aligned with SRIA priorities	25%	(Score × 0.25)
2	**Mutual Benefit**	• Is there clear added value for both the JU and the partner (e.g. programme/policy alignment, complementary/joint funding, visibility, project clustering, data exchange)? • Are both sides committed to follow-up actions?	**1 – Very Low:** Benefits only one side; unclear commitment. **2 – Low:** Minimal complementarity; limited mutual gain. **3 – Moderate:** Some reciprocal benefits identified; potential to scale up. **4 – High:** Clear, balanced value proposition for both parties. **5 – Very High:** Strong, strategic two-way benefits and long-term cooperation potential.	25%	(Score × 0.25)

3	**Implementation Feasibility**	• Are sufficient human and financial resources available (from both sides)? • Is the timing compatible with ongoing activities or AWP planning? • Are administrative processes compatible allowing practical implementation (e.g. timing of calls, co-funding rules, confidentiality, data-sharing procedures, or procurement/granting mechanisms)?	**1 – Very Low:** Not feasible; incompatible procedures or no resources. **2 – Low:** Major barriers in timing, funding, or governance. **3 – Moderate:** Feasible with adjustments; limited staff or timing constraints. **4 – High:** Operationally realistic with existing resources and procedures. **5 – Very High:** Readily implementable; strong procedural fit and resource availability.	20%	(Score × 0.20)
4	**Expected Impact**	• Will this synergy likely lead to measurable outcomes (e.g. co-funded projects, shared data, policy uptake)? • Does it contribute to EU objectives such as REPowerEU or EU Hydrogen Strategy?	**1 – Very Low:** Minimal or localised effects; unclear outputs. **2 – Low:** Limited impact on JU or EU objectives. **3 – Moderate:** Contributes to incremental improvements or small-scale collaboration. **4 – High:** Tangible benefits expected for JU objectives or policy initiatives. **5 – Very High:** Significant strategic or systemic impact with EU-wide visibility.	20%	(Score × 0.20)
5	**Strategic Visibility**	• Will the synergy enhance JU's reputation or cross-programme positioning? • Will it feature in key EC or stakeholder communications?	**1 – Very Low:** No external visibility or reputational value. **2 – Low:** Internal or niche visibility only. **3 – Moderate:** Some communication potential or stakeholder visibility.	10%	(Score × 0.10)

			4 – High: Notable visibility within the hydrogen ecosystem or EC fora. **5 – Very High:** High-profile partnership contributing to JU branding and strategic recognition.		

Table 11: Interpretation of scoring results

Score Range	Priority Level	Recommended Action
≥ 4.0	**High Priority**	Prepare formalisation document (MoC/MoU) and submit to Head of Operations/ED for validation.
3.0–3.9	**Medium Priority**	Pursue if resources allow; implement as pilot or informal cooperation.
< 3.0	**Low Priority**	Log in Synergy Register for future review; no immediate action required.

Operational Notes

- To be completed jointly by the **Project Officer** and **Synergies Officer** during the *Assessment* stage.
- Evidence must be cited for each criterion (SRIA references, past collaborations, stakeholder feedback).
- Store finalised checklist in the **Knowledge Hub (Synergies Workspace)** as part of the *Synergy Brief*.
- The **Head of Operations** reviews all "High Priority" synergies quarterly to ensure consistency and workload balance.