

Clean Energy Transition Partnership

From Innovation to Impact: Project Chaining for Scaling CETPartnership Results

How CETPartnership Projects Can Navigate Funding, Readiness, and Market Uptake

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List of Abbreviations

HEU Horizon Europe

H2020 Horizon2020

TRI Transition Initiative

1 Introduction

The CETPartnership aims to accelerate Europe's clean energy transition by funding transnational RDI projects that develop scalable and integrated energy solutions. These projects often operate at low to mid technology readiness levels (TRLs) and involve cross-border collaboration across sectors, disciplines, and innovation ecosystems.

Bringing such innovations from lab to market involves several challenges. These include ensuring continuity of funding across TRL stages, aligning technological development with stakeholder needs and market demands, and supporting the exploitation and scaling of project results.

This concept paper outlines a project chaining framework that integrates funding instruments, stakeholder engagement, and technology and business development support to enable successful and accelerated market uptake of CETPartnership-funded innovations. While the primary focus is on EU-level mechanisms, selected national instruments are also highlighted to illustrate their complementary role. Countries such as Austria, Germany, Italy, the Nordic countries, and Spain are used as examples due to their strong participation in CETPartnership projects and active national funding ecosystems.

2 Objectives of Project Chaining

- **Facilitate Funding Continuity:** Identify and map funding opportunities to support CETPartnership-funded projects as they transition from research to validation, demonstration, and market readiness.
- **Support Market and Societal Alignment:** Ensure that project outputs are developed with a clear path toward market and societal integration, taking into account stakeholder needs, infrastructure, regulation, and business models, as required by the funding instruments and investors of the next step.
- **Accelerate Uptake and Scaling:** Foster conditions for embedding CETPartnership innovations into existing systems or supporting the emergence of new solutions, with mechanisms that enable scaling and commercialization.
- **Leverage CETPartnership Tools and Activities:** Utilize the CETPartnership's Impact Library and Impact Network, training modules, exploitation support, and peer-learning formats to strengthen exploitation potential, stakeholder engagement, and systemic impact.

3 Project Chaining Framework

This framework outlines the key stages in transitioning innovations and solutions from early-stage research towards market and societal adoption. The document provides an analysis of each stage and concludes with recommendations to support the successful continuation of CETPartnership projects across these stages.

3.1 Early TRL (3–5): Advancing Research

At this stage, project teams focus on further developing technologies and preparing for future funding opportunities. The Impact Library and Exploitation Guidelines are resources that help teams engage with various stakeholders, align innovations with stakeholder needs, and identify appropriate funding sources. The Impact Network is a collection of key organisations along the path from lab to market, based on a comprehensive landscape analysis of the clean energy sector. For instance, the living labs and test beds listed there can play a role in validating technologies (TRL 4–5), testing their feasibility, and ensuring alignment with regional policies and market conditions. Similarly, standardisation bodies and industry associations can help clarify regulatory expectations and emerging requirements early on, supporting smoother progression toward demonstration stages.

3.2 Mid-TRL Demonstration (6–8): Bridging Research and Market

In this phase, the focus shifts to scaling technologies and testing them in real-world settings. Technologies at TRL 6–7 are typically tested through partnerships with private companies via commissioned research agreements or in Horizon Europe Innovation Actions (HEU IAs). Also CETPartnership often funds this stage. EU and national programmes such as ERDF and Interreg provide funding support for large-scale demonstrations and pilot projects, and small-scale Innovation Fund calls and private investors—including venture capital and corporate VC—become relevant at this stage for company-led innovations with strong market potential. At this stage, projects are also expected to start crystallising business models and preparing technology transfer pathways to ensure that demonstration efforts lead toward market entry and exploitation.

3.3 High TRL and Market Adoption (8–9): Reaching Commercial Readiness

At this stage, the technology has already been transferred to a commercial entity—typically a company capable of bringing the solution to market. Only businesses can carry out the necessary investments, take on market risk, and scale innovations toward adoption. The focus now is on ensuring that the technologies are commercialized and meet the necessary criteria for large-scale deployment. Seed funding from private investors, loans and grants from regional and national funders, and EU-level instruments such as the EIC Accelerator, EIT InnoEnergy, and the Innovation Fund support technologies in scaling and reaching market-ready solutions. This stage requires comprehensive business planning, validation of value chains, and alignment with commercial markets to enable wide-spread integration.

This framework serves as a descriptive guide for how technologies can progress through the different TRL stages and what else is necessary to move them from lab to market and to societal adoption. The following sections of the document will analyze these stages in greater detail, leading to a set of recommendations to help facilitate smooth transitions and ensure successful market adoption.

4 Project Chaining Pathways: From Project Outputs to Societal and Market Adoption

Projects under the CETPartnership program typically end at TRL 4–6, delivering prototypes, concepts, and subsystems that require further validation, demonstration, and commercialization to achieve impact.

The following pathways illustrate how innovations can transition through mid- and high-TRL stages to achieve market readiness, utilizing a combination of EU-level funding instruments and national funding opportunities to support each phase (for summary, see Table 1). For clarity, this document highlights only a small number of national examples, although CETPartnership spans over 20 member countries.

4.1 Early-to-Mid TRL (1–5): Advancing Research

CETPartnership projects often conclude with outputs at TRL 4–6, necessitating additional research to refine technology readiness, optimize solutions, and address regional or system specificity. Early-to-Mid stage funding focuses on research, innovation, and validation, creating a foundation for subsequent demonstration efforts.

4.1.1 Horizon Europe – Research and Innovation Actions (RIA)

- **Objective:** Support collaborative research to develop new knowledge and enhance technologies.
- **Target TRL:** 1–5.
- **Funding Form:** Grants covering 100% of eligible costs.
- **Beneficiaries:** Research organizations, companies, and consortiums.
- **Project Size and Duration:** Typically €500,000–€5 million; project duration of 2–4 years.
- **Consortium Requirements:** At least 3 partners from 3 different EU or associated countries.

4.1.2 National Research Funds

- **Examples:**
 - **Austria's FFG** (*Forschungsförderungsgesellschaft*): Applied research and technology development.
 - **Germany's DFG** (*Deutsche Forschungsgemeinschaft*): High-quality basic research.
 - **Business Finland:** Supports innovation and the development of technology to promote sustainable growth.
- **Target TRL:** 1–6.
- **Funding Form:** Typically grants for research organizations and companies.
- **Beneficiaries:** Typically research organizations, companies

4.1.3 Nordic Energy Research (NER)

- **Objective:** Promote cross-border collaboration in energy innovation among Nordic countries.
 - **Target TRL:** 3–6.
 - **Funding Form:** Grants.
 - **Beneficiaries:** Research organizations, companies
 - **Consortium size:** Typically 2–5 partners from Nordic countries
 - **Project duration:** 2–4 years
 - **Project size:** €500,000–€2 million
-

4.2 Mid-to-High-TRL Demonstration (6–8): Bridging Research and Market

Projects aiming for real-world demonstration and stakeholder-driven implementation transition to mid- and high-TRL funding. At this stage, Innovation Actions (IAs) and Commercial Commissioned Research are critical, along with regional and national programs, of which this chapter shows a few representative examples.

4.2.1 Horizon Europe – Innovation Actions (IA)

- **Objective:** Support demonstration, deployment, and scaling of innovative technologies and integrated solutions at higher TRLs (6–8).
- **Beneficiaries:** Research organizations, companies, consortia of at least 3 partners from 3 EU/associated countries.
- **Project Size and Duration:** Typically €5–20+ million, lasting 3–5 years. Larger projects often aim for significant regional or industrial-scale demonstrations.
- **Funding Form:** Grants covering 70% of eligible costs for companies; 100% for non-profits.
- **Criteria:** Degree of innovation, TRL progress, market and environmental impact, and robust business plans.

4.2.2 Commercial Commissioned Research

- **Objective:** Enable companies to adapt and integrate innovations into market-ready products by collaborating with research organisations and other partners.
- **Target TRL:** 4–8.
- **Funding Form:** Industry-funded research contracts, often co-financed by public incentives.
- **Relevance:** Commercial commissioned research plays a crucial role in advancing innovations from prototype to market-ready solutions. Through these contracts, companies can work closely with research organisations to further develop, customise, and validate technologies in operational settings. This model allows academic and RTO-led projects to transfer results into real-world applications, even before a full technology transfer occurs. For research-driven consortia, commissioned research provides a practical pathway to engage with market actors, align innovations with specific needs, and demonstrate relevance in industry-led contexts.
- **Example:** An energy system control algorithm developed in a research project could be further refined through a commissioned research agreement with a grid operator or technology supplier, ensuring compatibility with real-world infrastructure and compliance with sector-specific requirements.

4.2.3 National and Regional Funding Opportunities

Nordic Countries

1. **Business Finland (Finland):** Supports RDI all the way to pilot projects with loans and grants.
2. **Swedish Energy Agency (Sweden):** Offers grants and conditional loans for demonstration projects.
3. **Innovation Norway (Norway):** Provides grants, loans, and equity investments for pilot projects.
4. **Innovation Fund Denmark (Denmark):** Risk-sharing loans and grants for large-scale demonstrations.

Italy

1. **PNRR (National Recovery and Resilience Plan):** Focuses on green energy demonstrations with grants and loan guarantees.
2. **Regional Innovation Funds:** Supports regional energy projects in Lombardy and Emilia-Romagna.

Spain

1. **CDTI:** Provides soft loans and grants for applied energy research.
2. **Regional Funds:** Co-financing schemes in Andalusia and Catalonia for energy transition projects.

4.2.4 EIC Transition

- **Objective:** Support projects transitioning from promising research results (TRL 5–6) to validation and preparation for market maturity (TRL 8).
- **Target TRL:** 5–8.
- **Funding Form:** Grants up to €2.5 million for prototyping, validation, demonstration in operational environments, and business development.
- **Beneficiaries:** Single SMEs, spin-offs, or small consortia (up to five partners) that have demonstrated proof of concept from prior EU or national R&I projects.
- **Relevance to CETPartnership projects:** EIC Transition is a natural follow-up for companies or spin-offs advancing integrated solutions originating from CETPartnership-funded research, providing funding to validate technologies and business models for market deployment.
- **Example:** A company or spin-off further developing a renewable energy flexibility platform, preparing it for operational demonstration and commercial readiness.
- **Example:** Advancing integrated solutions, such as coupling renewable energy sources with smart grid technology, into a validated platform ready for large-scale demonstration.

4.2.5 Venture Capital and Corporate Venture Capital

- **Objective:** Provide risk capital to scale promising innovations with strong commercial potential and accelerate time-to-market through equity investment and strategic support.
- **Target TRL:** 6–9
- **Funding Form:** Equity investments, convertible loans, or hybrid models, typically ranging from seed to Series B stages.
- **Beneficiaries:** Start-ups, spin-offs, and SMEs with a clear business model, market traction, and a scalable technology or solution.

- **Relevance to CETPartnership projects:** Venture capital (VC) and corporate venture capital (CVC) can play a strategic role in supporting CETPartnership-originated innovations during the demonstration and business validation phase. At TRL 6–8, private investors may engage to help spin-offs or start-ups build commercial pilots, test business models, and prepare for market entry. While public programmes typically fund technical validation, VC and CVC investors bring complementary value through early business development support, strategic guidance, and access to sector-specific networks. This combination helps teams strengthen their execution capacity and de-risk the path toward full-scale commercial deployment.
- **Example:** A spin-off emerging from a CETPartnership project secures seed funding from a cleantech VC fund to build a pilot installation, validate its business model with early customers, and strengthen its core team for upcoming market entry.

4.2.6 European Regional Development Fund (ERDF)

- **Objective:** Promote regional economic growth, innovation, and reduce disparities within the EU, focusing on SMEs, competitiveness, and sustainable development.
- **Target TRL:** If applicable, typically mid-TRL levels (4–7), focusing on demonstration, validation, and early deployment.
- **Beneficiaries:** Companies, research organizations, and public entities.
- **Consortium Size:** Individual entities or regional consortia; regional partnerships are prioritized over international collaborations.
- **Project Duration:** 1–3 years.
- **Project Size:** €100,000–€5 million, depending on regional priorities and project scale.
- **Criteria:** Projects require a clear plan, budget, and for company projects, a business plan. Evaluations emphasize innovation, cost-effectiveness, market impact, environmental sustainability, and knowledge sharing.
- **Relevance:** ERDF is well-suited for projects seeking to **deploy integrated energy systems** at a regional scale.
- **Example:** Solutions such as integrating solar energy with local energy storage systems or developing regional energy hubs that combine renewable generation, energy management, and demand-side flexibility can leverage ERDF funding for deployment in specific regions, ensuring alignment with local energy needs and sustainability goals.

4.2.7 Interreg

- **Objective:** Facilitate cross-border cooperation for regional development and innovation projects.
- **Target TRL:** N/A, focus is on implementing regionally impactful solutions and collaboration.
- **Funding Form:** Grants requiring co-financing, tailored to regional contexts.
- **Beneficiaries:** Research organizations, companies, and public-private partnerships supporting cross-border collaboration.
- **Project Scope:** Typically 3–6 partners from different regional actors across countries.
- **Project Size and Duration:** €300,000 to €3 million; 2–3 years.
- **Criteria:** Strong regional impact, clear project plan, and demonstrated innovation.
- **Relevance to CETPartnership projects:** Interreg provides an ideal funding mechanism for projects focused on scaling integrated energy systems across borders, fostering cooperation between regions with shared challenges and opportunities.
- **Example:** a project developing a replicable energy system model in one region could use Interreg to adapt and demonstrate the solution in a neighboring region, facilitating knowledge

transfer, local stakeholder engagement, and cross-border synergies critical for scaling solutions across Europe.

4.2.8 State-Level Programs in Germany and Austria

- **Bavaria's Innovation Fund** and **Austria's Klima- und Energiefonds** enable demonstration and early-stage market validation.

4.3 High TRL and Market Adoption (8–9): Reaching Commercial Readiness

At the final stage, innovations transition to commercial-scale deployment, leveraging instruments tailored for scaling and market entry.

4.3.1 EIC Accelerator

- **Objective:** Support high-risk, high-potential innovations to scale to full market readiness and commercialization.
- **Target TRL:** 6–9, bridging the gap between demonstration and full market adoption.
- **Funding Form:** Blended finance, including:
- **Grants:** Up to €2.5 million for demonstration activities.
- **Equity Investments:** Up to €15 million for scaling and commercialization.
- **Beneficiaries:** Startups, SMEs, and innovative companies with market-ready solutions.
- **Relevance to CETPartnership projects:** Start-ups and SMEs can apply for EIC Accelerator funding to scale high-potential innovations that are close to market. The instrument is designed for companies that need support for final demonstration, market entry, and early commercial growth. Applicants must demonstrate technological excellence, a clear business case, and strong scaling potential.
- **Example:** A start-up founded to commercialise a hydrogen storage control system—validated during a CETPartnership project—applies for EIC Accelerator funding to bring the solution to market in off-grid mobility applications.

4.3.2 EIT InnoEnergy

- **Objective:** Support the scaling, commercialization, and market adoption of innovative energy technologies, particularly within start-ups and scale-ups.
- **Target TRL:** 6–9.
- **Funding Form:** Combination of grants, equity investments, and business acceleration services tailored to market needs.
- **Beneficiaries:** Start-ups, scale-ups, and companies with near-market-ready energy innovations.
- **Relevance to CETPartnership projects:** EIT InnoEnergy can support companies building on CETPartnership results by helping them accelerate market readiness, access industrial partners, and expand to new markets. In addition to funding, InnoEnergy offers sector-specific business coaching, access to its extensive partner network, and support in areas such as certification, manufacturing scale-up, and go-to-market strategy.
- **Example:** A start-up developing a power electronics module for flexible grid integration—validated in a CETPartnership project—joins the EIT InnoEnergy portfolio to access industrial

manufacturing partners, refine its certification pathway, and prepare for a first commercial deployment in Southern Europe.

4.3.3 Innovation Fund

- **Objective:** Accelerate the demonstration and commercialization of innovative low-carbon technologies with significant climate impact, supporting both large- and small-scale projects.
- **Target TRL:** 6–9.
- **Beneficiaries:** Companies, consortia, and project developers, including industries, energy providers, and technology owners with mature innovations ready for demonstration or scaling.
- **Funding Form:** Grants and co-financing based on project size and readiness:
 - **Large-Scale Projects:**
 - Designed for projects with capital costs exceeding €7.5 million.
 - Typical funding levels range from tens of millions to over €100 million, depending on the project's scope, potential emissions reductions, and scalability.
 - **Small-Scale Projects:**
 - For projects with capital costs below €7.5 million.
 - Focuses on pilot-scale demonstrations, bridging the gap between validation and commercial deployment.
- **Relevance to CETPartnership projects:** The Innovation Fund can provide follow-up financing for technologies initially developed and validated in CETPartnership projects, once they reach the stage of industrial piloting or commercial-scale deployment. It is particularly suitable for process or energy system innovations that require significant investment to prove their viability at scale and deliver measurable climate impact.
- **Example – Large-Scale Project:**
A company developing a high-temperature industrial heat pump system—originally validated in a CETPartnership project—applies for Innovation Fund support to build a full-scale demo at a chemical plant, aiming to reduce fossil heat use and associated emissions by over 80%.
- **Example – Small-Scale Project:**
A power-to-hydrogen system for balancing local energy grids, refined in a CETPartnership demonstration project, is deployed in a 1 MW pilot with Innovation Fund support to validate performance, business model, and emission savings in an industrial park.

4.3.4 IA Flagship (Horizon Europe)

- **Objective:** Support large-scale, near-market demonstration projects with systemic impact, particularly those involving integration across sectors, value chains, and technologies.
- **Target TRL:** 6–8, with a focus on reaching TRL 9.
- **Funding Form:** Grants covering up to 70% of eligible costs for profit-making entities (100% for non-profits).
 - **Scale:** Typically **tens to hundreds of millions of euros**, depending on the project scope and objectives.
- **Beneficiaries:** Company-led consortia involving research organizations, public authorities, SMEs, and other stakeholders from at least three different EU or associated countries.
- **Relevance to CETPartnership projects:** IA Flagship is particularly relevant for company-led consortia seeking to demonstrate CETPartnership-originated solutions at industrial scale, in real-world environments and with system-level integration. These projects offer a logical

next step for technologies or concepts validated at mid-TRL levels (e.g. 5–7), enabling the consortium to demonstrate their viability and impact in operational settings.

- **Example:** A company-led consortium builds on a CETPartnership project that piloted a circular heat integration concept for industrial parks. With Flagship funding, they deploy a full-scale demonstration integrating heat pumps, waste heat recovery, local grid optimisation, and cross-site energy management in a multi-industry zone—engaging public authorities, SMEs, and academia to ensure replicability and policy alignment.

4.3.5 European Investment Bank (EIB)

- **Objective:** Provide financing for large-scale infrastructure projects and market-ready innovations.
- **Target TRL:** 6–9.
- **Funding Form:** Loans, guarantees, venture debt, or equity-type instruments, often as part of blended finance structures or public-private partnerships.
- **Beneficiaries:** Public and private entities, including innovative SMEs, project developers, utilities, municipalities, and industrial consortia.
- **Relevance to CETPartnership projects:**
EIB financing can support the late-stage scaling and deployment of CETPartnership-originated technologies, particularly when moving from validated pilots (TRL 6–7) to commercial deployment (TRL 8–9). While the bank does not fund R&D, it offers several tailored instruments—such as venture debt or innovation loans—for companies and consortia with strong business models and demonstrated impact potential. EIB also plays a catalytic role in blended finance arrangements by de-risking private capital involvement.
- **Example:** A company developing industrial-scale heat recovery systems, validated in a CETPartnership demonstration project, receives EIB innovation loan financing to support first market deployments across several European sites under long-term contracts.

4.3.6 Venture Capital and Corporate Venture Capital

- **Objective:** Provide growth-stage capital to accelerate market entry and commercial scale-up of high-potential innovations.
- **Target TRL:** 8–9
- **Funding Form:** Equity investments, typically in Series A or B rounds, often combined with strategic partnerships.
- **Beneficiaries:** Scale-ups and start-ups with validated technology, market demand, and a clear plan for commercial expansion.
- **Relevance to CETPartnership projects:** Once CETPartnership-originated innovations reach TRL 8–9, private investors—particularly venture capital and corporate venture capital—can provide the capital and strategic support needed to enter the market and scale operations. This includes funding for production capacity, commercial team expansion, internationalisation, or infrastructure build-out. Corporate VCs may also act as launch customers or distribution partners, accelerating market penetration.
- **Example:** A scale-up that validated its hydrogen compression technology in a CETPartnership project raises Series A funding from a corporate venture arm of an energy utility to commercialise the system across industrial sites in Northern Europe.

4.4 Infrastructure Deployment (TRL 9+): Financing Scale and Replication

Once technologies reach full commercial readiness, the focus shifts from market entry to large-scale deployment and replication. This stage involves implementing solutions as part of infrastructure systems, industrial operations, or urban services—often through capital-intensive investment projects. To realise this, companies and project developers typically rely on infrastructure funds, project finance structures, or institutional investors, which support low-carbon assets with long-term, predictable returns. These financing instruments are critical for scaling up CETPartnership-originated innovations into tangible climate impact at system level.

4.4.1 Infrastructure Funds and Project Finance

- **Objective:** Finance the deployment of mature low-carbon technologies by investing in infrastructure assets with predictable long-term returns.
- **Target TRL:** 9+
- **Funding Form:** Equity or debt investment from infrastructure funds, institutional investors, or public financial institutions, typically channelled into project-specific entities (SPVs). These are often structured as blended finance packages, combining public guarantees, long-term offtake agreements (e.g. PPAs), or leasing schemes to reduce investor risk.
- **Beneficiaries:** Project developers, technology providers, and consortia deploying commercially proven solutions into infrastructure-scale settings (e.g. energy, transport, buildings, water).
- **Relevance to CETPartnership projects:** Infrastructure funds do not finance research, development, or demonstration, but they become highly relevant once CETPartnership-originated technologies have been fully validated, commercialised, and de-risked. In this phase, companies may collaborate with infrastructure investors to scale deployment through financeable, replicable project models—especially in capital-intensive sectors such as renewable energy integration, thermal networks, energy storage, or industrial decarbonisation.
- **Example:** A company that developed and validated a modular district heating system in a CETPartnership project collaborates with a green infrastructure fund to deploy the first commercial network in a mid-sized European city, under a long-term concession model.

4.4.2 Public Finance Institutions: The Role of EIB

- **Objective:** Support the deployment of low-carbon infrastructure by de-risking investment and crowding in private capital.
- **Target TRL:** 9+
- **Funding Form:** Loans, guarantees, or participation in blended finance structures; often combined with EU financial instruments such as InvestEU (future European Competitiveness Fund).
- **Beneficiaries:** Public and private project developers implementing large-scale climate-aligned infrastructure projects.
- **Relevance to CETPartnership projects:** While EIB does not fund research or early-stage development, it can be instrumental in enabling full-scale deployment of CETPartnership-derived technologies as part of investable infrastructure projects. Its participation improves bankability and facilitates access to complementary private financing, especially for capital-intensive investments in energy, buildings, or industrial decarbonisation.

- **Example:** A municipality partners with a private developer to roll out a smart low-temperature district heating network using a CETPartnership-validated solution, with EIB providing a long-term loan as part of a blended finance structure alongside equity from a green infrastructure fund.

Funder / Instrument	Target TRL	Main Purpose in Innovation Development
Horizon Europe – RIA	1–5	Fundamental and applied research; early-stage technology development
National Research Funds	1–6	Basic and applied research; initial concept validation
Nordic Energy Research	3–6	Cross-border energy innovation collaboration and early-stage validation
Commercial Commissioned Research	4–8	Industry-driven adaptation, development and operational validation of research-based solutions
ERDF (European Regional Development Fund)	4–7	Regional-scale deployment and demonstration of integrated solutions
National & Regional Programmes	5–7	Piloting and demonstration in national or local energy transition contexts
Interreg	N/A	Cross-border scaling and regional collaboration (non-technical)
Horizon Europe – IA	6–8	Demonstration and preparation for scaling of innovative technologies
EIC Transition	5–8	Bridging validated research results to market maturity through demonstration and business design
Venture Capital & Corporate VC	6–9	Funding for commercial pilots, business model validation, scaling, and international expansion
EIC Accelerator	6–9	Market entry and early commercial scale-up for high-risk, high-potential innovations
EIT InnoEnergy	6–9	Acceleration and commercialization of energy innovations, including access to partners and markets
Innovation Fund – Small Scale	6–8	Pilot-scale demonstration of low-carbon technologies with measurable emissions reduction potential
IA Flagship (Horizon Europe)	6–8 (→9)	Large-scale, systemic demonstration of integrated solutions in real-world settings
European Investment Bank (EIB)	6–9+	Financing for late-stage demonstration, commercial deployment, and infrastructure-scale roll-out
Innovation Fund – Large Scale	8–9	Commercial-scale deployment of major low-carbon technologies with high impact potential
Infrastructure Funds & Project Finance	9+	Full-scale infrastructure deployment of de-risked, validated technologies through SPVs

Table 1. Overview of public and private funding instruments across the innovation development path.

5 Alginor: A Case Study of Project Chaining

[Alginor](#), a leading innovator in the field of bio-based solutions, has successfully navigated various stages of development, from early-stage research to large-scale industrial applications, leveraging multiple public and private funding instruments. The company's journey provides a compelling example of how CETPartnership innovations, too, can evolve through a structured series of funding mechanisms, advancing technologies from prototype to market-ready solutions. This example demonstrates the importance of aligning funding sources and leveraging various instruments to facilitate the transition from research to commercialization.

Alginor's journey began with early-stage research and prototype development, progressing through several key projects that have helped the company scale its innovations. Over the last 10 years, Alginor has participated in at least 20 publicly funded projects, which have run in parallel and overlapped, each gradually advancing different aspects of the innovation and exploring new applications and product lines (**Fig. 1**). This progression ultimately led to the [PROTEUS](#) project, a Horizon Europe IA Flagship focused on scaling Alginor's biorefinery technology to industrial level.

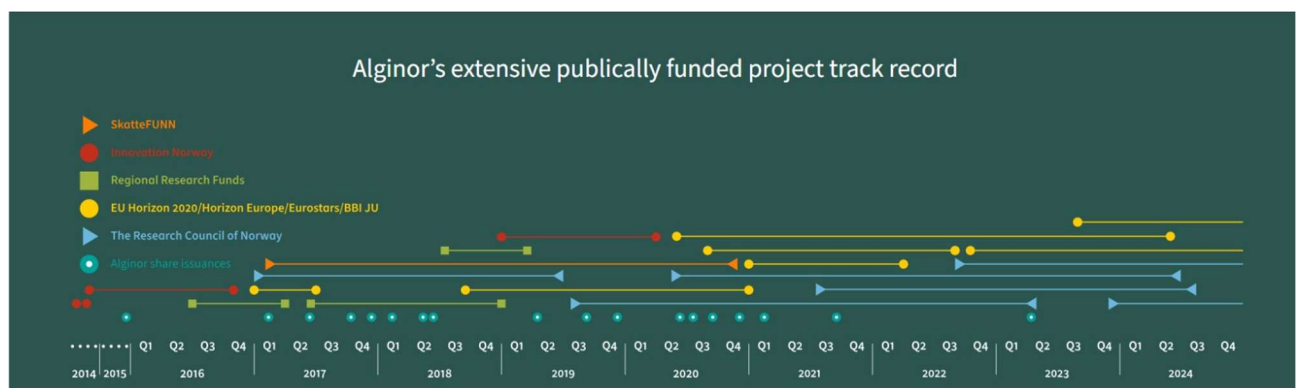


Figure 1: Alginor's publicly funded project history. Source: <https://alginor.no/facilities-projects/>

The initial phase of Alginor's innovation journey focused on developing foundational technologies, supported by funding from Horizon 2020, national research councils, and other regional sources. Early projects such as **AORTA 2 (H2020 RIA)** were essential for advancing Alginor's core biorefinery technology and building the knowledge base necessary for subsequent projects. These early-stage developments laid the groundwork for larger-scale innovations.

Figure 2 shows some of the key stages and projects in Alginor's subsequent journey from lab to market. The company started increasing the innovation's market readiness through **AORTA 2 (H2020 SME instrument)** and demonstrated the technology in **DACOTA (HEU IA funding)**. At the same time, the company engaged in multiple low-to-mid TRL projects (**CARBONOR, FUCOMED, ALGEFILM** etc) to explore possible applications and product lines.

The **DACOTA** project, funded through Horizon Europe's Innovation Action (IA), was crucial in scaling Alginor's kelp harvesting technology from prototype to commercial-scale deployment. By combining IA funding with private equity investment, the project demonstrated how public funding can support large-scale demonstrations and attract additional investment. This highlights **the role of IAs and**

other demonstration projects in advancing technologies toward market readiness, enabling their scaling through partnerships with companies that can lead the demonstration and commercialization phases. Following a CETPartnrship project, the technology can typically be taken forward by a company that can productize and demonstrate the innovation, securing the necessary funding for this phase.

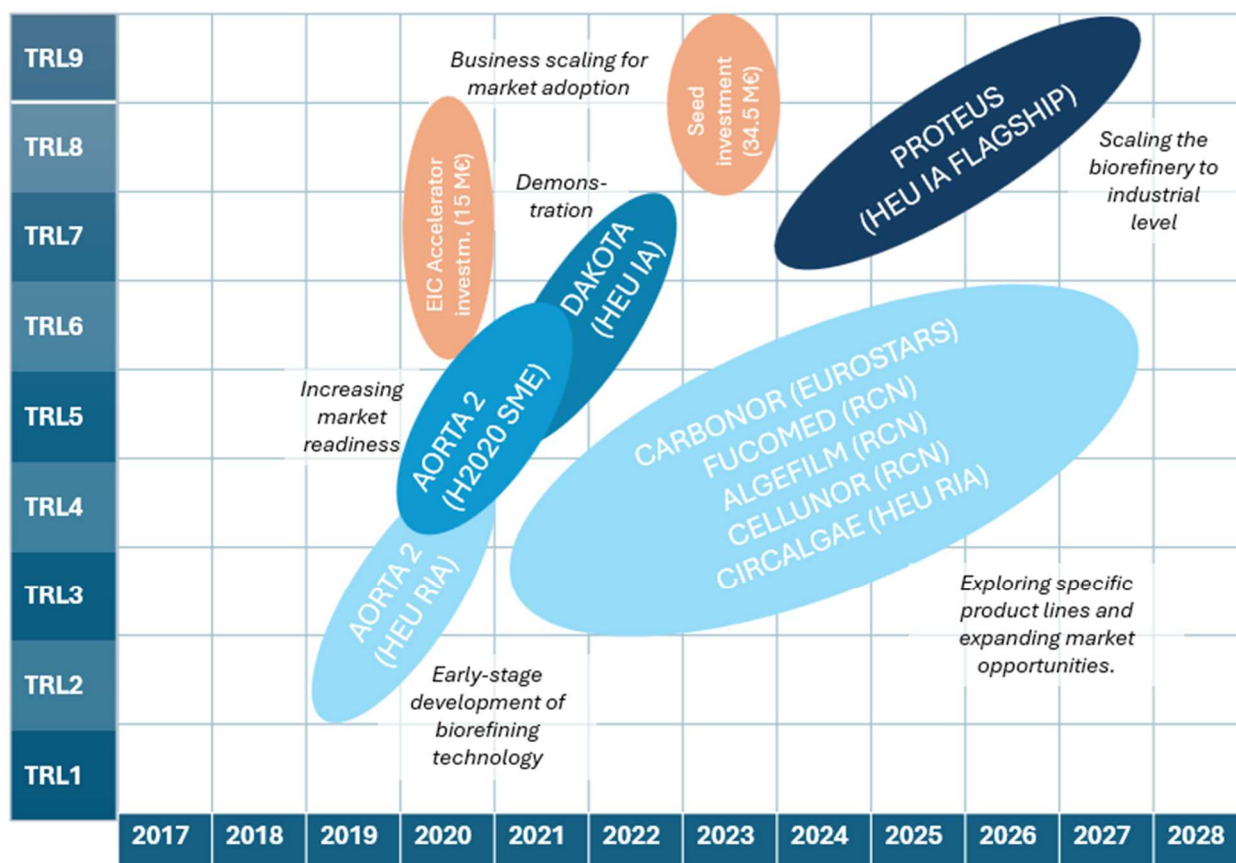


Figure 2: Part of Alginor's pathway to PROTEUS. Source: <https://alginor.no/>

By the time Alginor reached the **PROTEUS** project, the company had successfully scaled its innovations to TRL 8-9 and secured investment to facilitate commercialization and market uptake. The **PROTEUS** project, supported by Horizon Europe's IA Flagship funding, aims to deploy integrated biorefinery solutions at an industrial level, cementing Alginor's role in the European biotech sector.

This example shows how the combination of diverse funding sources, from early-stage research grants to large-scale commercialization funding, enables innovations to mature and reach the market. It also highlights the importance of strategic project chaining to move from low-TRL technology development to high-TRL market adoption and ensuring successful productization and commercialization on the way.

6 Key Challenges in Project Chaining – and How Projects Can Address Them

Successful project chaining is essential for achieving long-term impact and scaling CETPartnership-funded innovations. However, there are several critical challenges that must be addressed. This chapter outlines three key bottlenecks and proposes concrete ways to overcome them using existing CETPartnership tools and best practices from the ecosystem.

6.1 From R&D Results to Ownership: Transferring or Sharing

Challenge: Many CETPartnership projects are driven by research and technology organisations (RTOs) or academic consortia. As such, the innovations often remain within research environments unless specific actions are taken to transfer them into the hands of those who can further develop, deploy, or commercialise them. There are two principal routes:

- **Technology transfer**, where IP and ownership are transferred to a company or spin-off.
- **Open access knowledge sharing**, where the results are made available for others to adopt and implement.
- In both cases, the innovation must move to the next actor in the value chain. This transition requires clear ownership, documentation, and often re-packaging of results to make them actionable and usable.

What projects can do:

- Identify and describe **Key Exploitable Results (KERs)** clearly and early and make a sound **Exploitation plan** using the CETPartnership Impact Library tools.
- Clarify who holds ownership or licensing rights and prepare legal and technical documentation to enable transfer.
- Use matchmaking tools and pitching events to proactively seek companies, utilities, or public entities who could take the solution forward.
- Align technical deliverables with formats that are usable outside research, such as functional prototypes, API documentation, or operational manuals.

6.2 Raising Market, Commercial, and Societal Readiness

Challenge: Innovations often leave CETPartnership projects at TRL 5–6, with high technical potential but low maturity in terms of market fit, customer validation, or system integration. However, investors and funders of higher TRL stages already require clear evidence of this and without it, innovations stall at TRL 5-6.

Raising **market, commercial, and societal readiness** means preparing an innovation for use beyond the project context. As described in the **CETPartnership Exploitation Guidelines** (available via the *Impact Library*), this includes understanding user needs and use contexts, analysing market demand and product–market fit, developing viable business and financing models, ensuring regulatory compliance, and addressing issues of social acceptance and system integration.

In practice, these readiness dimensions are developed primarily through **interaction with external actors**. Engagement with potential users and customers informs market and user readiness, collaboration with commercial and value-chain partners helps validate business models and delivery capacity, and dialogue with funders, regulators, and public authorities shapes financing pathways and compliance. Readiness increases through iterative learning in real-world settings, rather than through project-internal analysis alone.

What projects can do:

- Apply structured tools from the CETPartnership **Impact Library** to work on market & commercial readiness, societal readiness, stakeholder analysis, and exploitation.
- Ensure that exploitation planning is not an afterthought, but a parallel stream of work alongside technical development with dedicated resources.
- Participate in trainings and webinars on exploitation and scaling offered by the CETPartnership and TRI-level support structures.

6.3 Immature Markets Limit Pull and Block Investment

Challenge: For transformative technologies and integrated system solutions, the main barrier is often not technical, but systemic: there is no functioning market to absorb the innovation. In sectors like decentralised energy, industrial decarbonisation, or circular materials, the supporting infrastructure, regulatory incentives, and value chains are still evolving. Without policy signals, risk-sharing mechanisms, and early adopters, private investors see limited upside and high uncertainty. This creates a paradox: innovations that are most needed may be the hardest to finance and scale. Overcoming this challenge requires deliberate market shaping—through policy co-creation, standardisation, aggregation of demand, and targeted public-private instruments.

What projects can do:

- Actively participate in CETPartnership's **Market Shaping activities**, including events like:
 - **Insight Harvest**, where experiences from projects and stakeholders are synthesised to inform programme-level learning.
 - **Policy Forums** and **Regulation Nodes**, where innovators can highlight regulatory bottlenecks or enabling conditions.
 - **Market dialogues and community feedback sessions**, where early adopters and solution developers exchange insights.
- Project-level insights are crucial for identifying **systemic bottlenecks**. These can then feed into ecosystem-level processes that help shape the enabling environment over time. Report these system and market barriers in your Annual reports for CETPartnership, so that they can be synthesised across projects and addressed through programme-level market shaping and policy activities.
- Use these platforms to voice structural barriers to market development and suggest how CETP could enable systemic change.

7 Recommendations to TRIs: Supporting Exploitation and Project Chaining

TRIs (Transition Initiatives) have a valuable opportunity to strengthen project chaining by integrating light-touch support activities into their regular operations. With limited resources and time, the most effective actions are those that enable access to existing CETPartnership tools, networks, and interfaces.

1. Enable Early Interaction Through Pitching and Matchmaking

- Organise portfolio-level **pitching and matchmaking sessions** where projects can meet potential follow-up partners: industry users, regional actors, investors, or public implementers.
- These sessions can be integrated into existing portfolio events or hosted virtually with minimal preparation by inviting a few selected external stakeholders.
- Focus especially on actors who could play a role in **adopting, scaling, or financing** validated technologies or concepts.

2. Connect Projects with CETPartnership's Common Tools and Resources

- In TRI-level events and communications, actively refer projects to CETPartnership-wide support resources:
 - **Impact Library:** Tools for exploitation planning, stakeholder mapping, market analysis, and more.
 - **Impact Network:** Ideas for partners along the lab-to-market pathway.
 - **Recorded trainings and webinars:** Training webinars on Design thinking, Living lab Essentials, Validation with End-users, Commercialization, Key Exploitable Results and Impact, Exploitation, and Demonstration and Investor Readiness are available in the Impact Library.
- Encourage project partners to participate in **CETPartnership-level training, feedback sessions, and investor days**, which are already organised centrally.

3. Collect and Forward System-Level Bottlenecks

- Use TRI events or project check-ins to gather project-level observations about **systemic barriers**—e.g. regulatory friction, market lock-ins, or standardisation gaps.
- Use these as basis for TRI or CETPartnership-level **Insight Harvest / Market Shaping sessions, Regulation Nodes** or organize events suitable for your own purpose.
- Even basic signals from the field help shape a more enabling environment and give visibility to common challenges across the portfolio.

8 Conclusions

Successful exploitation of CETPartnership project results depends not only on technological maturity but also on the ability to navigate the full innovation journey—from early research to demonstration, scale-up, and infrastructure deployment. This journey is rarely linear and requires a well-timed sequence of follow-on projects, funding applications, and strategic partnerships.

A key bottleneck for many EU-based innovations lies in the transition from mid-TRL demonstration to market entry. Too often, promising solutions become stuck at TRL 6–7 due to lack of readiness in areas that matter most to funders and investors: societal acceptance, market demand, and commercial viability. These dimensions cannot be developed in isolation. Instead, they emerge through active interaction with users, value chain actors, funders, regulators, and other stakeholders.

If project teams develop a clear understanding early on of the different funders and investors along this journey—and of what they are looking for and expecting from projects—they can better prepare for what lies ahead. This enables them to build societal, market, and commercial readiness from the start, rather than treat these as final-stage deliverables. With this foresight, projects improve their chances of securing competitive follow-on funding and of progressing toward scale, rather than stalling mid-way.

The CETPartnership offers a growing set of tools to support this path: from the Impact Library and Exploitation Guidelines to investor events, matchmaking, and policy engagement mechanisms. Used proactively, these resources help projects align their innovation efforts with the wider ecosystem and create the conditions needed for long-term impact.

9 References

Project Chaining Concept for TRI5

CETPartnership Impact Library, Impact Network, Impact events

CETPartnership Benchmarking analysis

Alginor website <https://alginor.no/>

Various European and national funding instruments