

Clean Energy Transition Partnership

EXPLOITATION GUIDELINES

To support CETPartnership Call applicants and beneficiaries



Co-funded by
the European Union

Disclaimer & Copyright

©2024, CETPARTNERSHIP

This publication has been provided by members of the CLEAN ENERGY TRANSITION Partnership (CETP). The content of the publication has been reviewed by the CETPARTNERSHIP members but does not necessarily represent the views held or expressed by any individual member of the partnership.

While the information contained in the document is believed to be accurate, CETPartnership members make no warranty of any kind regarding this material including, but not limited to the implied warranties of merchantability and fitness for a particular purpose. None of the CETPartnership members, their officers, employees, or agents shall be responsible, liable in negligence, or otherwise howsoever in respect of any inaccuracy or omission herein. Without derogating from the generality of the foregoing neither of the CETPartnership members, their officers, employees, or agents shall be liable for any direct, indirect, or consequential loss or damage caused by or arising from any information advice or inaccuracy or omission herein.

Content

1.MOTIVATION	4
2. EXPLOITATION PLAN	5
2.1 General guidelines and definitions.....	5
2.2 Support resources	6
2.3 Guidelines for the Exploitation plan.....	6
2.4 Societal and Market & Commercial Readiness.....	7
2.5 Example summary table for Key Exploitable Results	8
2.6 Stakeholder mapping and engagement plan	9
Annex 1. Societal and Market & Commercial Readiness scales with example activities	10
References	12

1. MOTIVATION

A key aim of the Clean Energy Transition Partnership is making a real impact by ensuring the innovation breakthroughs developed in the funded projects reach the market. Without broad adoption, our innovations will not transform society. To make this happen, we must embed societal, market, and commercial readiness into our exploitation strategies right from the start (Fig. 1). There is more involved than just testing; we need to understand barriers for transition and contribute to driving demand.

Even the most groundbreaking innovation can falter if a cheaper or more practical alternative already exists in the market. Success starts early in the innovation journey – by asking tough questions like, "Is society ready for this change? Is there a market demand? Can we sustain a reliable supply chain?" **Societal readiness** is crucial, not only for consumer-facing innovations; it involves building community support, addressing the societal and sustainability concerns the users and communities have, and navigating governance challenges.

Market and commercial readiness require understanding the competitive landscape and overcoming obstacles to commercialization. The economic risks of transitioning into new solutions can deter even the most motivated companies and other need-owners. Identifying challenges, from creating business models to securing a reliable supply, is key. Societal support and relevance are crucial even in such business decisions. They enhance market readiness, reduce economic uncertainties, attract funders, and make embracing new technologies easier.

These guidelines aim to help projects navigate these complexities in their exploitation strategies, encouraging a holistic approach to societal, market, and commercial readiness. You are not just innovators; you are pioneers shaping a sustainable future.

EXPLOITATION ASPECTS TO CONSIDER



Figure 1. Exploitation should consider all the aspects necessary for a successful clean energy innovation.

2. EXPLOITATION PLAN

2.1 General guidelines and definitions

Prepare a preliminary exploitation plan including a) assessment of Key Exploitable Results and their initial and target societal, market, and commercial readiness and b) an engagement plan for wider societal interaction. Table 1 describes some relevant concepts for exploitation.

Term	Definition
Exploitation	The use of results in further research and innovation activities other than those covered by the action concerned, including among other things, commercial exploitation such as developing, creating, manufacturing and marketing a product or process, creating and providing a service, or in standardization activities.
Key Exploitable Results	Pivotal outcomes or findings within the project that can be effectively utilized, commercialized, or applied to advance clean energy technologies and solutions. These results often include innovative technologies, processes, or knowledge that have the potential for economic, environmental, or societal impact in the field of clean energy.
Technological readiness	The extent to which a technology has advanced through development stages, indicating its maturity and suitability for real-world applications. It encompasses factors such as testing, validation, scalability, and demonstration, reflecting the technology's preparedness for widespread and effective use.
Societal readiness	The state of preparation within a community or society to effectively embrace, adopt, and integrate a particular change, innovation, or development. It assesses factors such as public awareness, acceptance, and the infrastructure and regulatory frameworks needed to support the successful implementation and impact of societal changes or advancements. Societal readiness addresses the legal and ethical guidelines that govern the innovation's implementation, ensuring alignment with societal values and goals while addressing potential risks and concerns.
Market and commercial readiness	The preparedness of a product, service, or innovation for successful entry and acceptance in the marketplace. Market readiness involves factors such as understanding customer needs, competitive landscape, and pricing strategies. Commercial readiness extends this concept to encompass operational aspects, supply chains, and distribution channels, ensuring that the offering is not only desired by the market but also effectively deliverable and sustainable in a business context. The later steps of commercial readiness often involve confidential internal processes within a company, encompassing aspects like proprietary production methods, quality control measures, and strategic business planning.
Commercialization	The process of transforming an idea, product, or technology into a market-ready and commercially viable solution. It involves activities such as strategic planning, market research, partnership building, manufacturing, and distribution, with the ultimate goal of bringing the innovation to market and generating revenue. Commercialization typically requires collaboration with a technology or service provider (such as Siemens, Vestas, Valmet, ABB or SMEs) or a startup company. Forming these strategic partnerships can be a time-consuming process, emphasizing the importance of identifying potential commercialization partners and end-users

	early on in the innovation path, even at low Technology Readiness Levels (TRL). For teams considering the startup pathway, building a strong team, identifying a capable CEO, and securing funding are critical steps to navigate the entrepreneurial landscape successfully.
--	---

Table 1. Terms and definitions regarding exploitation.

2.2 Support resources

To enhance the impact of exploitation and stakeholder engagement, the [CETP Impact Library](#) offers a range of tools for identifying Key Exploitable Results and SRL and MCRL levels that you can use already at proposal phase. Furthermore, the EU offers a wide range of services free of charge such as [Horizon Results Booster](#), [Horizon Results Platform](#), to assist beneficiaries in dissemination and exploitation activities and to enhance visibility of results. NYSERDA has a useful [Technology & Commercial Readiness Calculator](#).

2.3 Guidelines for the Exploitation plan

1. **Introduction and objectives:** Provide an overview of the project and its objectives, highlighting the societal, technological or business need/problem, and describe what is the added value of your research, technology, or methodology. Clearly state the specific objectives of the exploitation plan, outlining the intended utilization of project results and the desired societal, economic, or scientific impacts.
2. **Key Exploitable Results (KER) and Exploitation Strategy:** Identify the KERs: the areas of highest impact and value creation, such as new products, services, processes, or policy recommendations. Identify the partner responsible for each KER, the target groups for the KERs and the interaction strategies and actions to be taken for reaching them and ensuring effectively exploiting the project results. This may include assessing the societal acceptance/resistance/risks of the innovation, validation of the solution with stakeholders, identifying commercialization pathways and partners, technology transfer activities, demonstrations, piloting, collaborations, or licensing agreements. Determine the initial and target Technological, Societal, and Market & Commercial Readiness levels of each KER and compile a summary table (see 2.4 and Annex for assessment scales and Table 2 for example summary table).
3. **Intellectual Property Management (IP):** Identify and describe the new, tangible and intangible results generated by the project, such as data, knowledge, software, or inventions. Discuss the approach for protecting and managing IP rights, including any existing or potential patents.
4. **Collaboration and Partnerships:** Identify potential partners or collaborators for further development, exploitation, scaling up, or commercialization of the project results. Discuss the strategies for fostering collaborations and securing necessary resources.
5. **Obstacles to Exploitation, Ethical and Legal Considerations:** Show you understand the barriers to any exploitation of your results (inadequate financing, skills shortages, missing value chains, policies that make fossil-based or otherwise less sustainable alternatives more competitive, incompatibility between parts of systems (lack of standards), mismatch between market needs and the solution, user behaviour). How will you tackle them? Address any ethical, legal, or regulatory aspects associated with the exploitation of the project results. This may include compliance with data protection regulations, ethical guidelines, or environmental standards.

2.4 Societal and Market & Commercial Readiness

Striving to advance technological (TRL), societal (SRL), and market & commercial (MCRL) readiness side by side is a strategically advisable approach as it fosters a well-rounded and sustainable innovation (Fig. 2). Technological readiness ensures that the product or solution meets high standards of functionality and reliability. Concurrently addressing societal aspects allows for considerations of ethical implications, user adoption, and broader societal impacts. Simultaneously improving the market & commercial readiness of the solution ensures strategic positioning in the competitive landscape and facilitates faster market penetration. It also enhances the project's attractiveness to potential funders and commercialization partners. However, it is crucial to acknowledge that the optimal sequencing of readiness activities can vary based on the nature of the innovation. Flexibility in the approach allows for adaptability to the unique characteristics and challenges of each innovation, ensuring a balanced and effective development process.

While the scales in these guidelines provide structure in drafting an exploitation plan, in real life, the readiness journey is iterative and adaptable and the innovation rarely moves on all scales in the same step. The process often involves cyclical, dynamic loops, revisiting ideas based on feedback from customers, societal stakeholders, and validation results. TRL levels can go back down during validation of different modules or when integrating a module into a bigger system, and MCRL can depend on the development of other solutions, without which the original innovation has no market value. Societal readiness can depend on the development of incentives and favourable regulation. These scales act as guideposts in a flexible journey, allowing continuous learning and adjustments for a robust innovation trajectory.



Figure 2. Technological¹, societal² and market & commercial readiness³ assessment scales. Ideally, all three readiness scales advance approximately side by side in the innovation process. In practice, each innovation is different with a unique pathway to market, technological, and societal readiness.

*In the case of key enabling technologies¹

2.5 Example summary table for Key Exploitable Results

Provide a summary of your Key Exploitable Results (KER), their target stakeholders, exploitation strategies and of the responsible partner driving the exploitation of each KER. Include the steps or the increase in TRL, SRL and/or MCRL you are expecting to take during the project and, potentially, after the project, as in the example below (Table 2).

Key Exploitable Result	Responsible partner	Target stakeholders and need-owners	Exploitation strategy, including plans to determine & increase societal, market and commercial readiness	Expected TRL/SRL/MCRL increase
LCA guidelines for CCU	Partner 1, WP1	DG Env National env agencies	Co-creation of guidelines that fit the needs of the regulatory bodies and environmental targets	SRL 2 -> 4
CO ₂ -source to CO ₂ -use spatial mapping	Partner 2, WP2	Regional industrial hubs, Ministries of Energy & Environment, CO ₂ users (fuels, chemicals, construction), environmental NGOs, cities & municipalities	Workshop series to plan useful interactive maps to bridge industrial emissions and potential users and to discuss & validate the potential and risks of CCU with energy & environmental policy and environmental NGOs.	SRL 2 -> 4
CCU technology with 20 % increase in capture efficiency	Partner 3, WP3	Technology provider Valmet and adsorptive material supplier Novomof End-users: Finnish pulp and oil companies, e.g. StoraEnso, MetsäGroup, Neste; Societal stakeholders: NGOs, cities & municipalities Next step funders: Innovation Fund and EIB; VCs: BP Ventures, Copenhagen Infrastructure Partners	Validation with Novomof in relevant environment at Valmet large-scale test facilities with relevant end-users and societal stakeholders (MG, SE, N, cities & municipalities) Detailed market survey. Evidence supporting a solid business case and value chain. Basic understanding of competitive products and target applications. One-on-one meetings with the VCs and companies on next steps: demonstration and piloting collaboration & commercialization	TRL 4 -> 5 SRL 2-> 5 MCRL 2-> 3 (Preparation for future TRL 5->7 MCRL3 -> MCRL6)

Table 2. Example summary table for hypothetical Key Exploitable Results. The inclusion of real company names in this example is purely for illustrative purposes and does not constitute any real-life association, endorsement, or affiliation.

2.6 Stakeholder mapping and engagement plan

2.6.1 Identify the stakeholders for your project using the Penta Helix approach

- a) **Research:** Academia, research institutions, and scientists dedicated to advancing knowledge and technology in the clean energy domain and fields of socio-technical system transition, environmental sustainability and social equity. Innovation ecosystems and living labs.
- b) **Industry:** Companies and businesses involved in the development, testing, manufacturing, and commercialization of clean energy technologies, encompassing clean energy technology/service providers, end-users, and other need-owners in the value chains.
- c) **Government:** Regulatory bodies, government agencies, and policymakers responsible for creating and enforcing policies that impact the clean energy sector, including incentives, regulations, and standards.
- d) **Civil society:** Non-governmental organizations (NGOs), environmental groups, and community organizations advocating for sustainable and equitable clean energy practices, as well as representing the interests of the public.
- e) **Funding:** Financial institutions, venture capitalists, and funding agencies providing the necessary financial support for clean energy RDI projects, facilitating their development and implementation.

2.6.2 Categorize the identified stakeholders according to the influence/interest matrix and plan engagement strategies accordingly

Understanding the influence and interest levels of each stakeholder is crucial for effective project management. High-influence, high-interest stakeholders may require close collaboration and regular communication (COLLABORATE), while low-influence, low-interest stakeholders may need minimal engagement (INFORM). Some stakeholders fall between these two ends (INVOLVE, CONSULT). Tailoring engagement strategies based on such categorization ensures that resources are allocated efficiently, and stakeholders are appropriately involved throughout the project lifecycle (Table 3).

CATEGORY	Stakeholder	Areas of interest/influence	Engagement method	Timing	Frequency	Responsible partner
COLLABORATE						
INVOLVE						
CONSULT						
INFORM						

Table 3. Example summary table of a stakeholder engagement plan.

Annex 1. Societal and Market & Commercial Readiness scales with example activities

Societal readiness (SRL) assessment scale

Societal readiness level	Example description	Example activity to reach this level
SRL 1 – Identifying problem and identifying societal readiness.	Identifying a societal problem, stakeholders, and societal readiness.	Conduct a comprehensive problem analysis through literature review and/or engage with potential end-users through surveys, interviews, design processes (design thinking), or focus groups to gauge awareness and willingness to address the identified problem.
SRL 2 – Formulation of problem, proposed solution(s) and potential impact, expected societal readiness; identifying relevant stakeholders for the project.	Formulation of problem, solutions, and impact. Readiness of identified stakeholders determined	Develop a detailed proposal outlining the problem, proposed solutions, and the expected societal impact. Continue to engage with stakeholders in workshops or collaborative sessions to refine the proposal and identify relevant project stakeholders.
SRL 3 – Initial testing of proposed solution(s) together with relevant stakeholders.	Initial testing of solution concepts & scenarios with relevant stakeholders (surveys, workshops)	Initiate small-scale testing or simulations of the proposed solutions, involving key stakeholders to gather initial feedback and assess that the solution meets their needs in a controlled environment.
SRL 4 – Problem validated through pilot testing in relevant environment to substantiate proposed impact and societal readiness.	Pilot testing of prototype in relevant environment for feedback on practicality & acceptance /resistance.	Implement pilot testing in a real-world setting with the involvement of stakeholders, validating the effectiveness of the proposed solutions and confirming the societal impact in a specific environment.
SRL 5 – Proposed solution(s) validated, now by relevant stakeholders in the area.	Solution validated by relevant stakeholders in the area in various conditions.	Expand the validation to a broader group of stakeholders in the targeted area, ensuring that the proposed solutions align with local needs and garnering support from a diverse set of perspectives.
SRL 6 – Solution(s) demonstrated in relevant environment and in co-operation with relevant stakeholders to gain initial feedback on potential impact.	Demonstration in relevant environment with relevant stakeholders. Impacts, benefits.	Demonstrate the solutions in a real-world environment with active collaboration from stakeholders. Collect feedback, assess usability, and gain insights into the potential impact in a cooperative setting.
SRL 7 – Refinement of project and/or solution and, if needed, retesting in relevant environment with relevant stakeholders.	Refinement and retesting in relevant environment with relevant stakeholders.	Refine the project based on feedback received, addressing any identified shortcomings. Conduct additional testing if necessary, ensuring that the project and solutions are responsive to stakeholder needs.
SRL 8 – Proposed solution(s) as well as a plan for societal adaptation complete and qualified.	Plan for societal adoption complete, adapted to local culture and dynamics.	Finalize the proposed solutions and develop a comprehensive plan for societal adaptation. Ensure that the solutions align with the needs and expectations of stakeholders, and that the plan includes strategies for seamless integration into society.
SRL 9 – Actual project solution(s) proven in relevant environment.	Solution proven in relevant environment.	Implement the actual project solutions in the targeted environment, measuring their success and impact against predefined criteria. Gather conclusive evidence that the solutions effectively address the identified problem and contribute to societal well-being.

Market & Commercial readiness (MCRL) assessment scale

Market/commercial readiness level	Example description	Example activity to reach this level
MCRL1 - Business idea to address a specific market need with a unique solution. Determining market relevance.	Define the purpose of the innovation and show how it is different from current offer. Preliminary definition of targeted markets, estimated market size. Conduct an initial value chain analysis.	Verify the genuine impact of the problem your innovation addresses and assess whether its resolution is significant to the end user through surveys/interviews /prototype testing.
MCRL2 – Basic market, regulatory, and operating environment analysis, potential applications and competitive landscape identified. Initial business model and value proposition.	Assess market & regulatory needs and trends. Analysis of current existing solutions offered by competitors. Customer target groups and needs identified. Cost-benefit analysis: evaluate production, investment, and installation costs and quantify potential benefits of your innovation.	Interviews with potential customers. Redefine business model and value proposition based on customer feedback. Market & business workshops with experts to provide insights into market dynamics, success factors and risks for market entry, and potential partnerships.
MCRL3 - Detailed market survey. Evidence supporting a solid business case and value chain. Basic understanding of competitive products and target applications.	Customer analysis and pain points. Address customer adoption risks, ensuring compatibility and reliability. Market and customer needs translated to product requirements and initial relationships with key stakeholders across the value chain established.	Conduct a thorough market analysis, defining specific target markets and estimating market size globally and in EU. Determine if the innovation has market relevance now or in the future. Identify and map key stakeholders in the market ecosystem and value chain.
MCRL4 - Preliminary business plan: overview of income/cost generation, supply chain requirements, distribution, and target markets. Overview of investment needs.	If the innovation needs to connect with other solutions to form a business idea, identify the necessary solutions and partnerships, outlining the assumptions you make for commercial success.	Business Model Canvas workshop to outline income/cost generation, distribution, and market targeting strategies. Engage diverse stakeholders to contribute their expertise in shaping the initial business model.
MCRL5 - Regulatory compliance: Adhere to industry standards and regulations. Obtain necessary regulatory approvals and consider standardization.	Thorough review of industry regulations and standards to identify compliance requirements. If applicable, inclusive workshops with industry experts, regulators, and stakeholders to establish industry standards.	Early engagement with authorities to seek guidance and establish communication channels for smooth compliance and approval processes. Use workshops for initial overviews and targeted interactions for detailed discussions.
MCRL6 - Balanced development team with technical, business, marketing etc. experience. Vision and narrative for the innovation and a commercialization plan.	Collect the necessary people and skills into the team ready and capable to move forward towards commercialization and attracting funding and investors.	Training sessions to establish each team member's role and responsibilities. Next, craft a compelling and credible vision for the innovation. Co-design a roadmap for commercialization – typically either the startup or the licensing pathway.
MCRL7 – Hand-over to or strategic partnership with commercialization partner or start-up. Detailed business plan validated. Go-to-Market Strategy.	Financial model, supply chain, certifications, regulations. Go-to-Market Strategy. Partnerships formed across the value chain. Manufacturing process qualifications defined and in progress.	Confidential processes conducted internally within the commercializing company/start-up.
MCRL8 – Supply and demand routes, value chain, distribution, marketing, production confirmed. Certification and regulation requirements underway.	Supply agreements with suppliers and partners in place. Initial purchase orders from customers. Products pilot manufactured and sold to initial customers.	Confidential processes conducted internally within the commercializing company/start-up.

MCRL9 – Final Go-to-Market Strategy ready, certifications and regulation requirements ready. Phased launch plan ready for implementation.	Full scale manufacturing and widespread deployment of product to customers is ready to commence.	Confidential processes conducted internally within the commercializing company/start-up.
--	--	--

References

1. *"Technology readiness levels (TRL); Extract from Part 19 - Commission Decision C(2014)4995"* ec.europa.eu. 2014
2. Societal Readiness Levels (SRL). Innovation Fund Denmark 2018.
3. Adapted from e.g. New York State Energy Research & Development Authority (NYSERDA) & Horizon Europe & University Technology Transfer resources