



RIPEET OVERALL IMPACT ASSESSMENT

Deliverable No 6.3

Ingeborg Meijer i.meijer@cwts.leidenuniv.nl
Gabriele Quinti quinti@knowledge-innovation.org
Tim P. Willemse t.p.h.willemse@cwts.leidenuniv.nl



RIPEET – Responsible Energy Transition

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 101006295 - H2020-SwafS-2018-2020 / H2020-SwafS-2020-1



Executive Summary

This deliverable has been drafted within the scope of RIPEET WP6, focusing on "Monitoring, Evaluation, and Impact Assessment." It encompasses the outcomes of T6.4, which pertains to the "Overall Impact Assessment" carried out across three European regions: Extremadura, Ostrobothnia, and Outer Hebrides. RIPEET initiated various interventions and actions aimed at engaging and collaborating with stakeholders in the energy sector, with a particular emphasis on energy transition. This involved establishing 'Transition Labs' and conducting three policy experiments (pilot actions). The report begins by outlining the theoretical foundations, methodology, and analytical framework employed in this comprehensive assessment, providing context on topics such as the role of Responsible Research and Innovation (RRI) within the RIPEET framework. The assessment includes descriptions of the local research and innovation contexts in the three regions, along with details on the pilot actions conducted and the transformative changes observed. In this regard, the assessment highlighted progress in the three regions, particularly (but not exclusively) in relation to SDG7, which focuses on 'access to affordable, reliable, sustainable, and modern energy for all.' For example, notable advancements include the establishment of a more favourable environment for the growth of effective Energy Communities in Extremadura and the identification of shared solutions necessary for enabling the energy transition in the Outer Hebrides at the local level. Additionally, progress has been made in relation to SDG17, which emphasizes 'partnerships for sustainable development.' This progress is evident in all three regions, where efforts have contributed to intensifying cooperation among various stakeholders, even those who previously may have been unfamiliar with or overlooked each other, in pursuit of the energy transition. The assessment also examines specific Responsible Research and Innovation (RRI) keys, with particular emphasis on two areas.

1. **Public Engagement:** This involved engaging individuals who previously lacked a voice or channels to address energy transition issues. Notable examples include the pilot actions conducted in Extremadura and Ostrobothnia, which facilitated participation from previously marginalized groups.
2. **Research and Innovation (R&I) Governance in Energy:** For instance, in Ostrobothnia, there was a deliberate effort to incorporate citizens' perspectives into regional energy innovation discussions, with a focus on rural communities and their village associations.

Furthermore, the assessment explores the role of transdisciplinary partnerships, such as those in Ostrobothnia, which resulted in increased local interest in science and the recognition of villages as focal points for regional research and development projects. This approach also led to a deeper understanding of societal challenges related to energy and climate change issues.

Additionally, the assessment considers: (i) The strategies implemented in each region to ensure the sustainability of transition labs and funded pilot actions; (ii) Their potential applicability in other regions within the RIPEET network and beyond.

These insights are interspersed with reflections on the RIPEET process (RIPEET reflection), and the report concludes by summarizing and comparing the main results.

Deliverable Information

D6.3 – Overall Impact Assessment Report	
Deliverable number	D6.3
Responsible partner	K&I
Due date of deliverable	31.01.2024
Actual submission date	27.02.2024
Version	2.0
Authors	Ingeborg Meijer (UL), Gabriele Quinti (KI), Tim P. Willemse (UL)
Reviewers	Mario del Viejo Martínez (Fundecyt); Johanna Dahl (RCO); Mona Enell-Nilsson (UVA); Wolfgang Haider (ZSI); Tauno Kekäle (Merinova); Matthew Logan (CES); Sarah Marshall (HIE); Rachel C. Tully (AGENEX)
Work package number	WP6
Work package title	Monitoring, evaluation and impact assessment
Work package leader	K&I

Dissemination Level		
CO	Confidential, only for members of the consortium including the Commission Services	☐
PU	Public	☒
PP	Restricted to other programme participants, including the Commission Services	☐
RE	Restricted to a group specified by the consortium including the Commission Services	☐

Nature of the Deliverable		
R	Report	☒
D	Demonstrator	☐
W	Website, patent filing, etc.	☐
O	Other	☐

Partners Involved in the Deliverable

Participant No.	Name of the Organisation	Short Name	Involved
2	UNIVERSITEIT LEIDEN	UL	X
4	KNOWLEDGE & INNOVATION	K&I	X

List of Abbreviations

Abbreviation	Long Form
CES	Community Energy Scotland
CSO(s)	Civil Society Organisation(s)
DG-RTD	Directorate-General Research & Innovation
ESCo	Energy supply company
EU	European Union
GDP	Gross Domestic Expenditure
GE	Gender Equality
ICNZ	Island Centre for Net Zero
M&E	Monitoring and Evaluation
NGO(s)	Non-Governmental Organisation(s)
NPO(s)	Non-Profit Organisation(s)
OECD	Organisation for Economic Co-operation and Development
ORRI	Open and Responsible Research and Innovation
OS	Oper Science
OTC	“Oficinas para la Transformación Comunitaria”
PE	Public Engagement
R&D	Research & Development
R&I	Research & Innovation
RCO	Regional Council of Ostrobothnia
REC(s)	Renewable Energy Community(ies)
REI	Research Ethics and Integrity
RRI	Responsible, Research and Innovation
SDG(s)	Sustainable Development Goal(s)
SME(s)	Small and Medium Enterprise(s)
SSEN	Scottish and Southern Electricity Networks)
SWAFS	Science Within and For Society
SWOT	Strengths, Weaknesses, Possibilities and Threats
VASEK	Vaasanseudun Kehitys Oy – Vasaregionens Utveckling Ab
WP	Work Package

Table of contents

Executive Summary	1
Deliverable Information	2
Partners Involved in the Deliverable	3
List of Abbreviations.....	3
Table of contents.....	4
1. Institutional framework, approach and methodology	6
1.1. Two precautions.....	6
1.2. Two evaluation approaches	8
1.3. Multi-stakeholder.....	10
1.4. RRI and the Super MoRRI context.....	11
1.5. Sources of information (Data Vehicles).....	13
2. A few important related phenomena in the Global context.....	16
2.1. Energy Poverty	16
2.2. Russia-Ukraine conflict.....	16
2.3. Climate action.....	17
2.4. Citizens' participation crisis.....	17
2.5. Energy communities / broad active citizenship in the energy sector	18
3. Regional impact.....	19
3.1. Extremadura	19
Contextualisation	19
Pilot process	20
Pilot impact and RIPEET regional impact	24
3.2. Ostrobothnia	26
Contextualisation	26
Pilot process	27
Pilot impact and RIPEET regional impact	32
3.3. Outer Hebrides	35
Contextualisation	35
Pilot process	36
Pilot impact and RIPEET regional impact	40
4. RIPEET reflection	43
4.1. RIPEET's overall impact	43
4.2. RIPEET's main features.....	45
Ownership and embedding.....	46
Translation and negotiation	46
Sustained engagement.....	47
5. Sustainability	48
5.1. Extremadura	48

5.2. Ostrobothnia	50
5.3. Outer Hebrides	53
6. Beyond RIPEET	56
6.1. Transferability to Mirror regions and beyond	56
Extremadura, Andalucia, and Lithuania	57
Ostrobothnia, Egersund, and Silesia	58
Outer Hebrides, Aran Islands, and La Reunion.....	59
... and beyond	59
6.2. Spreading the RIPEET methodology	61
7. Concluding remarks.....	62
7.1. Sustainable development goals	62
7.2. MoRRI/SuperMoRRI	63
7.3. Transdisciplinary advancement.....	65
7.4. Structural Change	66
7.5. Sustainability	66
7.6. Transferability.....	67
7.7. A concluding “game”	68
8. References	70

1. Institutional framework, approach and methodology

The European project “Responsible research and Innovation Policy Experimentations for Energy Transition – RIPEET” aimed to support Responsible, Research and Innovation (RRI) policy experimentations for the energy transition in three European territories – in Extremadura (ES), Outer Hebrides in Scotland (UK) and Ostrobothnia (FI). The RIPEET project has been realised by a consortium of 11 partners under the coordination of Zentrum für Soziale Innovation GmbH (ZSI)¹. It experimented with innovative policy approaches in the energy sector in the above-mentioned European regions and contributed for up-scaling and replication across further territories (Mirror regions).

In this frame, WP6 “Monitoring, evaluation and impact assessment”, coordinated by K&I with an important involvement of the University of Leiden, aimed to accompany the RIPEET process in all the steps of the project. The WP6 specific objectives were:

- Supporting the implementation of the Transition Lab experimentation by monitoring their progress as well as the quality of the different steps
- Evaluating the three main processes ongoing in the three strands of the experimentation, i.e., policy development, stakeholder engagement, and innovation pilots
- Assessing the impacts of the Transition Labs.

The WP6 was articulated in four tasks:

- Task 6.1 – “Monitoring, evaluation and impact assessment tools and plan”
- Task 6.2 – “Periodical Monitoring of the RIPEET process”
- Task 6.3 – “Developmental evaluation”
- Task 6.4 – “Overall Impact Assessment”.

This deliverable (D6.3) reports the results of the Overall Impact Assessment. It should be noted that it was drawn up at the same time as the set-up of deliverable D6.2, which includes the first, second- and third-year assessment reports drafted for each of the three RIPEET regions. D6.2 and D6.3 should be considered as complementary in a global RIPEET assessment perspective.

D6.3 has been drafted according to the criteria specified in the section that follow.

1.1. Two precautions

Talking about the overall impact assessment of a project when it is underway, even in its terminal phase, is a bit problematic. According to the European Commission, “in an impact assessment process, the term impact describes all the changes which are expected to happen due to the implementation

¹ It should be noted that the RIPEET project has many similar institutional, structural and technical characteristics to the CHERRIES project, even though it is dedicated to different sectors (health in the case of CHERRIES and energy transition in the case of RIPEET). It follows that the characteristics adopted in the Monitoring and Evaluation have some similarities (in the choice of some features in the theoretical approaches, as well as some indicators) with that of CHERRIES (but also many differences). It should also be noted that K&I had the WP lead “Monitoring, evaluation and impact assessment” in Cherries and in RIPEET. In both projects, the University of Leiden was involved, too.

and application of a given policy option/intervention. Such impacts may occur over different timescales, affect different actors and be relevant at different scales (local, regional, national and EU). Other key methodological problems include data availability, understanding of contextual dynamics of research and innovation, causality claims (attribution and contribution), and impact trajectories. In an evaluation context, impact refers to the changes associated with a particular intervention that occur over the longer term². According to this – and many other similar definitions – the impact of a project can only be assessed, in its entirety, long after its conclusion (e.g., several months, if not a few years later).

This is not the situation we find ourselves in as, in this specific case, the assessment is carried out when RIPEET is still in progress. The on-site visits (*pars magna* of RIPEET's overall impact assessment) took place between the end of November and the end of December 2023 when the pilot actions implemented by RIPEET at the end of the Transition Labs in the three regions were “formally” ending but were, to all intents and purposes, still underway. So, the overall impact assessment in RIPEET (which is the purpose of this document) is an impact assessment “as the facts stand” (December 2023). Given this background, we will therefore be exploring both the actual impacts – consolidated or not – and the potential impacts in the near future (e.g., perceived anticipations of change).

The second precaution is linked to the complexity of the territorial contexts involved in RIPEET. These are not closed or semi-open ‘laboratories’ but territorial areas where, even if we restrict the scope to the energy sector or energy transition, thousands of actors are at work, dozens of projects are underway, dozens of policies are being implemented in a more or less advanced and coordinated fashion, etc.

It means that hundreds of external factors (in sectoral or territorial terms) that interfere should be considered. In each of its three territorial ‘areas of competence’ (Extremadura, Ostrobothnia, and Outer Hebrides), RIPEET is simply a project involving a few dozen actors within an immense complex context. Except in a few cases (where the connections are obvious), delineating the ‘proper’ impact even “as the facts stand” (first caution), i.e., to compare the current situation ‘with RIPEET’ with the still current situation ‘without RIPEET’, is therefore impossible. Taking these exceptions into account, what can be done, on the other hand, is to highlight phenomena of change (or others) that have occurred or are occurring in each of the three territories which, by logical criteria, can be traced back to RIPEET.

The following two examples (which we will deal with briefly, without considering all the complexity they would require) can be explanatory.

There is no doubt that perception and attention to energy poverty in the Outer Hebrides has increased considerably over the last three years. This is the almost unanimous opinion of all the stakeholders involved in RIPEET and is also evident from consulting the press, social media, etc. On the other hand, the theme on which RIPEET focused, in the Outer Hebrides, can be formulated in the following way: “Reducing energy poverty and inequality between the islands and the mainland in this regard”. Can

² https://commission.europa.eu/law/law-making-process/planning-and-proposing-law/better-regulation/better-regulation-guidelines-and-toolbox_en

we then say that thanks to RIPEET there is now greater attention paid to energy poverty in the Outer Hebrides? Certainly not, when we remember that these same three years were characterized, among other things, in a significant part of the world by exponential increases in the cost of energy, which has led to a notable increase in the inability of many users to pay their energy bills almost everywhere and has led various governments and authorities to introduce subsidies and price caps to overcome this crisis. The perception and attention to energy poverty have increased almost everywhere. It is possible that RIPEET, in the specific context of the Outer Hebrides, played a role, but it would be difficult to say that it was the main factor.

Ostrobothnia is one of the most advanced European regions in terms of technological innovation, including the energy sector. On the other hand, the theme on which RIPEET focused in Ostrobothnia can be formulated in the following way “valorise opportunity/policy frame for (social) sustainable decentralized (local) energy initiatives”. Can we then say that thanks to RIPEET there is now greater attention paid to decentralized energy solutions in Ostrobothnia? Here too, one might have doubts by pointing out that greater involvement of civil society and the implementation of decentralised local solutions in the energy sector is a far-reaching phenomenon (think, for example, of the Eco-villages in Germany or the Renewable Energy Communities in Spain and Italy).

Considering, however, (i) that RCO is one of the partners of RIPEET; (ii) that the “Triple-Helix approach” was and, in part, still is more than consolidated in Ostrobothnia; (iii) that the strategic scope of the two RIPEET pilot-actions towards the “quadruple helix approach” has been highlighted by multiple stakeholders, it can reasonably be said that RIPEET has had a substantial impact in this regard (although it is not the only factor that is relevant).

In dealing with these two examples, we have carried out a rough multivariate analysis³, which, of course, is not possible in relation to the various impacts we will discuss in this report. They do, however, help us to understand the inevitable level of approximation that we need to have in trying to describe the overall impact assessment of RIPEET.

1.2. Two evaluation approaches

As already stated in D6.1⁴, in RIPEET the Overall impact assessment is inspired by two evaluation approaches.

a) Summative evaluation⁵ is centred on the evaluation of the outcomes of a project, in terms of actions carried out, products (outputs), results with respect to the objectives and impacts, desired and unwanted effects. These are some of the main characteristics of a summative evaluation:

- i) Render definitive judgements of success or failure
- ii) Measure success against predetermined goals
- iii) Position the evaluator outside to assure independence and objectivity

³ Bernard S. Phillips (1972) - Metodologia della ricerca sociale, Il Mulino.

⁴ RIPEET (2021) - D6.1. Monitoring, evaluation and impact assessment - Tools and plan.

⁵ Luke, A., Cazden, C., Coopes, R., Klenowski, V., Ladwig, J., Lester, J. & Woods, A. (2013). A Summative Evaluation of the Stronger Smarter Learning Communities Project: 2013 Report-Volume 1 and Volume 2.

- iv) Design the evaluation based on linear cause-effect logic models
- v) Accountability focused on and directed to external authorities and funders
- vi) Aim to produce generalisable findings across time and space
- vii) Evaluator controls the evaluation and determines the design based on the evaluator's perspective on what is important
- viii) Evaluator engenders fear of failure.

b) Developmental (or formative) evaluation is aimed above all at assisting those who work in complex social projects (such as the 3 territorial experimentations in RIPEET) with a high innovation content (i.e., social innovation initiatives) to anticipate, recognise and deal with the problems that arise during the course of the project. Developmental evaluation is a formative approach, meant for learning and understanding, mainly oriented towards supporting social innovation processes, with a view to utilisation-focused evaluation of the results. Development evaluation is a concept first developed by Patton⁶. It involves long-term relationships between evaluators and project or programme staff. Evaluation is ongoing, which means that feedback can be provided continuously. Among the main characteristics of a developmental evaluation:

- i) Provide feedback, generate learnings, support direction or affirm changes in direction
- ii) Develop new measures and monitoring mechanisms as goals emerge and evolve
- iii) Position evaluation as an internal, team function integrated into action and ongoing interpretive processes
- iv) Design the evaluation to capture system dynamics, interdependencies, and emergent interconnections
- v) Accountability centred on the innovators' deep sense of fundamental values and commitments
- vi) Aim to produce context-specific understandings⁷ that inform ongoing innovation
- vii) Evaluator collaborates in the change effort to design a process that matches philosophically and organisationally
- viii) Evaluator supports hunger for learning.

It is quite evident that the “overall impact assessment” is a final evaluation that should “measure success against predetermined goals”, “directed to external authorities and funders” (in this case, first of all the European Commission). So, the summative approach is crucial. However, especially if we want the evaluation to be functional and assistive also to those who implement the project, formative evaluation aspects were and still are crucial⁸.

Therefore, in RIPEET, some elements of the developmental approach have been adopted to “soften” and make some characteristics of the summative approach less rigid. More specifically:

⁶ Patton, M. Q. (2006). Evaluation for the way we work. *Non-profit Quarterly*, 13(1), 28-33.

⁷ Patton, M.Q. (1996). A world larger than formative and summative. *Evaluation practice*, 17(2), 131-144.

⁸ The summative and developmental approaches characterized the whole Monitoring and Evaluation (M&E) frame of RIPEET. The former assumed a managerial procedure ensuring that the activities are aligned with the requirements of the infrastructure that the project operates in (grant agreement, timings, objectives.). The latter assumes M&E as a supporting action to identify and solve problems that the regional teams encounter and provide the space for reflexivity to account for the complexity of the regional context. It is quite evident that this last function was crucial during the RIPEET implementation.

- The RIPEET responsible partners of the assessment (K&I and University of Leiden) assumed an intermediate position as both internal and external to the experimentations' teams, establish a partnering relationship with the three project teams in the three regions (Extremadura, Outer Hebrides, Ostrobothnia)
- So, they do not “engenders fear of failure”; however, they “support hunger for learning”
- The overall impact assessment in RIPEET produces more context-specific understandings (related to the three regions) than “generalisable findings across time and space”
- Captures system dynamics, interdependencies, and emergent interconnections and does not consider (only) linear cause-effect logic model (as already shown in §1.1.).

Finally, while this overall impact assessment will contain elements to evaluate success or possible failures (summative), it will not have a judging function, but rather one of “generating learning” (formative).

1.3. Multi-stakeholder

The RIPEET environment is not only complex, but also uncertain, marked by the involvement of various diverse stakeholders that each have their own agendas, ideas of what good research and innovation is (or no idea on what R&I is), routines and world views, So, since its conception, RIPEET intended to bring together quintuple helix⁹ actors in Transition Labs in order to envisage and implement a place-based energy transition process, i.e.:

- Territorial governments' actors or their subsidiaries
- Universities and the higher education system
- Industry, SMEs, start-ups and other private companies
- Civil society and society at large; and
- “Natural environment” (such as CSOs and NPOs aiming at ecological protection and conservation).

Moreover, during its implementation¹⁰, it has been noted that the quintuple helix does not do enough justice to the societal complexity. So, in the Transition Labs setup, we go beyond the quintuple helix approach by looking at the great heterogeneity of stakeholders/actors in the three RIPEET regions, for example by distinguishing the various levels of public administration (from central to local); or considering the heterogeneity of the civil society, highlighting the significant differences between urban and rural communities or between NGOs and village groups, as it happened in Ostrobothnia. So, we can say that a multi-stakeholders (or multi-actors) approach is among the main pillars of RIPEET and is aimed at identifying/mapping all the actors involved or who could/should be involved in policies and actions (and, obviously, in the various activities of the Transition Lab), trying to understand roles, expectations, ideas, etc.

⁹ The quintuple helix approach is an enlargement of the quadruple helix approach (with the addition of the “natural environment” used (also) by the European Union to accelerate the transfer of research and innovation results to regional growth. See: European Committee of the Regions, Volpe, M., Friedl, J., Cavallini, S., et al., Using the quadruple helix approach to accelerate the transfer of research and innovation results to regional growth, Committee of the Regions, 2016, <https://data.europa.eu/doi/10.2863/0082>

¹⁰ RIPEET (2022) - D2.2 Synthesis Report on Ecosystems, Reflection and Territorial Priorities.

It follows that a multistakeholder approach is also among the main pillars of the methodology adopted in this overall impact assessment. An attempt was therefore made to implement a broad consultation of actors, as far as possible coordinated and interactive through workshops and working groups to draw the narratives under which the Transition Labs were implemented in the three regions and the effects/changes they produced (having in mind, of course, the two precautions described in §1.1.).

1.4. RRI and the Super MoRRI context

RIPEET belongs to a cluster of projects funded by the European Commission in the frame of the Horizon 2020 SWAFS (Science Within and For Society) Work Program all inspired by the Responsible Research and Innovation (RRI), and more specifically related to RRI when translating it to regional territories.

The European Commission, and more particularly the DG-RTD, has set in place RRI as an instrument to not only anticipate, include, respond to and reflect¹¹ on science and technology in the making, but also has recommended an operationalisation of the concept that urges scientists, researchers and innovators to consider the so-called ‘dimensions’, including public engagement, gender equality, science education, ethics, open access and governance in how they relate to problems and their imagined solutions¹². In relation to these various dimensions of RRI, a system of indicators called MoRRI (from 2014-2018) has been conceived which, however, applies only to the country-level and, therefore, as such, is not relevant to RIPEET.

A central project within SWAFS is Super MoRRI (2018-2023) that was funded to clear up the ambiguities around the monitoring and evaluation of RRI¹³, including the issue mentioned just above. From the get-go Super MoRRI aimed for a monitoring framework that is supportive to the organisational level, be it funders, research organisations, or other stakeholders involved. And to develop such a monitoring framework in a responsible and co-creative way together with other RRI-projects funded under SWAFS.

When RIPEET was executed, there were no Super MoRRI indicators, as promised in D6.1. Moreover, the mention of RRI as a policy in the present Horizon Europe projects (if compared to the projects of the previous Horizon 2020 program) decreased and almost disappeared in projects dealing with regional (or lower) scale. The current policy paradigm is “Open and Responsible Research and Innovation (ORRI) practices, which overlap with but are different from RRI. Therefore, it is fair to say that RRI “conceptualization (in theory) and operationalization remain ambiguous. Further, in practice, this makes its application to regional development difficult^{14”}.

Nonetheless, Super MoRRI offered two principles rather early on: responsible quantification and credible contextualization. Responsible quantification requires continuous reflexive conceptual development, staying attuned to the most recent findings in studies on the use of indicators, but also,

¹¹ Stilgoe, J., Owen, R., and Macnaghten, P. (2013). Developing a framework for responsible innovation. Res. Policy 42, 1568–1580. doi: 10.1016/j.respol.2013.05.008

¹² European Commission. (2014). Responsible research and innovation: Europe’s ability to respond to societal challenges. Publications Office. <https://data.europa.eu/doi/10.2777/95935>

¹³ A Monitoring Framework for Responsible Research and Innovation Strategic Development Plan 2020-24 <https://super-morri.eu/download/153/findings-and-deliverables/5179/d-1-2-strategic-development-plan-2020-24.pdf>

¹⁴ Responsible research and innovation: a systematic review of the literature and its applications to regional studies. Available at: <https://www.tandfonline.com/doi/full/10.1080/09654313.2019.1625871>

and perhaps most challenging, humility. Responsible quantification means acknowledging that what is deemed responsible or irresponsible is actor, context, and relation dependent. This requires coming to terms with the need for an open dialogue, especially with those being assessed, on what responsible quantification and assessment means for them. Credible contextualization requires acknowledging that concepts as contentious as RRI cannot be decontextualized and require accompanying information for users to properly contextualize their creation, use, and meaning. Both principles have been considered in this overall impact assessment and have resulted in a parsimonious quantification, favouring qualitative approaches (with a focus on the overall process and attached actors); and in the relativization of the information gathered by interpreting it, as far as possible, within their own context of reference.

Super MoRRI designed a monitoring framework that could be useful for various purposes and fulfilled different functions. A monitoring framework allows for experimentation, discrete perspectives and admits potentially high degrees of context dependence. This offers greater strategic potential than a system of indicators at a single level of analysis, such as national scoreboards, that drive toward indicator standardisation and context independent comparisons. Super MoRRI moved away from indicators and instead focuses on markers of responsibility. These are formulated as: Ethics and Integrity; Gender Equality, Public Engagement, Open Science and Third Mission which refers to the third academic task of universities (in addition to research and education) relating to entrepreneurship and knowledge transfer. For each of the markers of responsibility a Theory of Change has been formulated as to how and why this is relevant to pursue to achieve Responsible Research and Innovation.

The Theory of Change associated with Gender Equality (GE) is that more representation of diverse perspectives and gender balance in R&I teams has an intrinsic democratic value and will generate output that is more aligned to societal needs, which in turn would help alleviate inequality, and lead to more social sustainability. Thus, RRI related gender and diversity aspects in the research and innovation system focus on efforts to develop, mobilize, and leverage the talents of women and marginalized groups.

The Theory of Change for Public Engagement (PE) is that involving citizens and stakeholders in research, which already holds an intrinsic democratic value, will generate research outputs that will be more aligned with societal needs. PE can take on a variety of forms, both in the form of individual activities as well as through policy-oriented activities. PE has direct intersections with other responsibility practices, such as open science, citizen science and ‘third mission’, and hence it can be expected that PE activities have spillover effects onto other responsibility related domains. The several data collections and the cases show that pathways to this benefit are far more complex than often discussed and that there are several institutional and disciplinary hurdles to be considered.

The Theory of Change for Citizen science (CS) is closely connected to that of PE. The ideal pathway that emerges from CS is that through the process of CS, new avenues for research and research application can emerge. This has benefits that are twofold, first being that the R&I system is more aligned to society and second, citizens become more empowered, engaged, and trusting towards science.

Open Science (OS) refers to sharing knowledge and involving others to conduct research in a more open way for the benefits of science and society. The Theory of Change is similar to the one of PE, namely that OS has intrinsically better qualities because it is more aligned with the societal, economic and environmental needs of society and because it democratizes the research and innovation system. OS also refers to specific efforts to move towards more open knowledge structures, such as making research not published in English more accessible and efforts to improve the reusability of data and the reproducibility of results. The concept of OS has expanded over time, from instrumental aspects such as Open Access and Open data to include Open scientific knowledge; Open science infrastructures; Open engagement of societal actors; and Open dialogue with other knowledge systems (UNESCO, 2019 OS Recommendation). It is also assumed that OS helps lead to more efficient use of scientific resources such as software, hardware, and source code, as well as more readily sharing educational materials.

The Theory of Change associated with Research Ethics and Integrity (REI) is that consideration of issues around ethics and integrity is intrinsically imperative and of democratic and social value. The expectation is that bolstering a research and innovation system with ethical practices will generate outputs that prioritize consideration of the ethical implications of research and innovation. By REI we understand the application of ethical principles or values to various issues and fields of R&I, including ethical aspects of the design and conduct of research, whether research results may be misused, and aspects of scientific misconduct.

Although not an explicit RRI key, interventions to shift research and innovation practices towards sustainable social and environmental development is an important marker for responsibility in terms of research and innovation meeting societal needs. The Theory of Change is that RRI practices will lead to outcomes that contribute to more sustainability. However, this entails a transmission between the research community and societal users embedded within local communities. The assumption is that open and responsible practices can help move sustainability research outside of the ivory tower of academia so that it has a sustainability benefit for society and the environment. Sustainability also relates to capacity building within the research and stakeholder communities to achieve social and environmental sustainability outcomes RIPEET is revolving strongly exactly around this marker of responsibility.

1.5. Sources of information (Data Vehicles)

In view of the previous sections, this overall impact assessment had a bifocal approach to the project's activities: on the one hand, the territorial experimentations with co-creative approaches (and their actors), and on the other hand, the implications on energy transition governance, the projects' intervening potentials and strategic alignment with ongoing regional activities to maximise the projects' impacts.

This deliverable aims at describing the breadth and depth of the RIPEET activities, the learnings that emerged from them and the contextual factors that played a role during its execution. To inform these aspects, a wide array of data vehicles was employed. Each data vehicle had a different purpose, both

for the gathering of information to inform the aspect like in this report, but also towards the actors in the fields these vehicles were attached to (performative potential).

Data vehicles (or information sources) for the overall impact assessment¹⁵ are as follows.

- a) Documents – All the documents produced in the frame of RIPEET have been re-read in light of the objectives of this overall impact assessment. More specifically:
 - i) The technical deliverables¹⁶
 - ii) The first, second- and third-year assessment reports in the three RIPEET regions which will constitute the D6.2 being prepared in parallel with this deliverable
 - iii) The 40 feedback sheets of as many monitoring sessions conducted during the course of RIPEET
 - iv) The minutes of the RIPEET General Assemblies
 - v) The minutes and other documents of the RIPEET cross-regional meetings.
- b) Contextual data/information (e.g., relevant SDGs indicators/proxi indicators¹⁷).
- c) Working sessions – With reference to each of the three regions, the following working sessions (e.g., ongoing participatory moments of reflection and iterative feedback) were held:
 - i) Brainstorming with the territorial RIPEET partners (all during the RIPEET General Assembly in Rome, October 24th, 2023)
 - ii) Impact reflection session (Vaasa/Ostrobothnia, November 29th, 2023; Stornoway/Outer Hebrides, December 5th, 2023; Badajoz/Extremadura, December 18th, 2023), with the

¹⁵ It should be specified that those listed here are only the tools used for informing the overall impact assessment and not the whole M&E process during RIPEET. In this frame, further tools were used: (i) an Evaluation questionnaire filled each year by the RIPEET territorial partners in each region (3rd year included); focus-groups held each year in each region with the RIPEET territorial partners and the main stakeholders involved; further consultations with main stakeholders not able to participate in the focus group; bi-monthly monitoring sessions (starting in Month 8) with the RIPEET regional partners for each region.

¹⁶ The deliverables that have been most widely exploited are:

- D.2.1 – Territorial perspectives: R&I energy transition ecosystems in Extremadura, Ostrobothnia, and Highlands and Islands of Scotland; and D5.4 - RIPEET position paper. monitoring RIS3 through an RRI approach for drafting §3.1., 3.2., 3.3. and 4.2. in this deliverable
- D.4.1. RIPEET Territorial Transition Pathways; and D.4.2 – Selection Report on Niche Innovation Needs for drafting §3.1., 3.2. and 3.3. in this deliverable (as well as the first, second- and third-year assessment reports in the three RIPEET regions which will constitute the D6.2 - Experiment Evaluation Report and the feedback sheets of the Bi-Monthly Monitoring Sessions).

¹⁷ According to the DoA, 5 SDGs should be taken into consideration: SDG7 – Affordable energy - ensure access to affordable, reliable, sustainable and modern energy for all; SDG11 – Sustainable cities and communities - make cities and human settlements inclusive, safe, resilient and sustainable; SDG12 – Responsible consumption and production - ensure sustainable consumption and production patterns; SDG13 – Climate action - take urgent action to combat climate change and its impacts; SDG17 – Partnerships for the goals - strengthen the means of implementation and revitalise the global partnership for sustainable development. All these goals are relevant in RIPEET. However, the indicators suggested by the United Nations for measuring these goals are less relevant also because often data are not available at the territorial level in the three RIPEET regions (SDGs and the corresponding indicators have been conceived for the country-level). So, often, only a few indicators can be used and these indicators should be mainly “proxy” to the SDGs. Moreover, it is very difficult (nearly always impossible) to get data for 2020 (“before RIPEET”) and 2023 or 2024 (“at the end” or “after” RIPEET). Finally, it is quite evident that a possible change of the value of an indicator would be due to a multiplicity of factors, RIPEET being (if anything...) only one of these. So, we can say that SDGs functioned as contextualisation in the project proposal rather than actionable analytical vistas in the M&E activities that were conducted.

- participation, beyond the territorial partners of around 8/10 among the main stakeholders involved in the Transition Lab in each region
- iii) Sustainability session/workshop (Vaasa/Ostrobothnia, November 29th, 2023; Stornoway/Outer Hebrides, December 5th, 2023; Badajoz/Extremadura, December 18th, 2023) with the participation, beyond the territorial partners of around 8/10 among the main stakeholders involved in the Transition Lab and 10/15 further stakeholders interested in the RIPEET results and its follow-up in each region
 - iv) Wrap-up with the territorial RIPEET partners (Vaasa/Ostrobothnia, November 30th, 2023; Stornoway/Outer Hebrides, December 6th, 2023; Badajoz/Extremadura, December 18th, 2023).
- d) Individual “evaluative conversations” with 4/5 main important stakeholders (per region) involved in the transition labs, held during the on-site visits and the RIPEET final conference in Brussels in January 2024 or online in November/December 2023.
- e) Individual consultation of a representative for each one of the six Mirror regions (Andalucia in Spain; Lithuania; Eigersund in Norway; Silesia in Poland; La Réunion in France; and Aran Islands in Ireland) held in November/December 2023).
- f) Direct observation of meetings (co-creation meetings, community sessions, etc.) and energy transition sites during the on-site visits held along the RIPEET implementation (not only the three finals held on November 28th-30th 2023 in Ostrobothnia; December 5th-6th in Outer Hebrides; and December 18th-19th in Extremadura).

2. A few important related phenomena in the Global context

In this section, we present a description of a few major socio-political trends that unfolded between 2020 and 2024, partly heavily influencing the implementation of RIPEET. The aim of this is to identify the possible factors, beyond RIPEET, that affected the three RIPEET regions. Due to the magnitude of the issues, we focus on listing those contextual factors explicitly mentioned in the various working sessions held in the three regions in the course of this overall impact assessment. These are factors mentioned during the project that are assumed to have influenced the phenomena connected to the energy transition that RIPEET dealt with in each of the three regions. Therefore, this list is far from exhaustive, but allows us to give us an idea of the most perceived contextual factors by the RIPEET regional involved stakeholders.

2.1. Energy Poverty

The first factor that we have to take into consideration is the energy crisis, which accelerated, especially starting in the winter of 2022 with the outbreak of the conflict between Russia and Ukraine. This crisis has led to considerable increases in the cost of energy, partially controlled thanks to various types of public interventions. In many countries, however, the cost of energy has more than doubled, only gradually declining during 2023. The surge in costs, however, has put the issue of energy poverty firmly on the agenda (both in the energy sector as well as in social policy agendas in all European countries). Looking at the three RIPEET regions, what has been said has taken on even greater relevance in the Outer Hebrides mainly for two reasons: (i) the strong sensitivity on the topic in Scotland already pre-existing to the crisis¹⁸; (ii) the particularly precarious situation of the Outer Hebrides where the cost of energy is higher than in the mainland. Conversely, in Finland (and therefore in Ostrobothnia) energy (or fuel) poverty was an unknown phenomenon until 2022¹⁹ and therefore, even later, its importance is limited. Extremadura can be considered to be in an intermediate situation.

2.2. Russia-Ukraine conflict

The second factor is the conflict between Russia and Ukraine. Beyond the energy crisis, this affected and is still affecting Finland, which radically changed the bilateral relation with Russia (at any level, from politics to tourism, from economic to culture). In December 2023 Finland closed (almost entirely) its entire 1,340-kilometer (832-mile) border with Russia. The weakening, if not breakdown of economic relations between Russia and Finland has led the latter to further strengthen its energy transition policy and further push towards renewable energies. Indeed, in 2022 Finland was seen to be highly dependent on Russian imports. The main points of dependence were considered to be oil and gas in the energy sector in particular, as well as timber for the pulp industry. Russian inputs to the energy

¹⁸ The Scottish Government and Parliament have been dealing with the topic for years. In 2018, a bill was approved that renewed the criteria for determining what is a household living in fuel poverty (and in extreme fuel poverty). The Bill also proposes a new target to reduce the proportion of Scottish households living in fuel poverty to no more than 5% by 2040. See:

<http://www.parliament.scot/parliamentarybusiness/Bills/108916.aspx>

¹⁹ This topic was widely discussed during the RIPEET Community Session which was held in Vaasa on June 20th, 2023 (see the intervention of the main speaker Tapio Tuomi).

system were substantial: over 40% of the gross available energy was imported from Russia. Finland was one of the countries that was able to (almost) completely and quickly decouple from the use of Russian natural gas the energy solution that has gained increasing traction is wind power and, as a still small but increasingly important alternative, solar power²⁰. Ostrobothnia, being the most western region in Finland, was not so affected by the Finland / Russia relation cuts. Nevertheless, the further push towards renewable energies (positively) affected Ostrobothnia too. As underlined in a brainstorming with the RIPEET core team in Ostrobothnia (October 24th, 2023) *“The threat from Russia helped to think for ourselves, created the urgency to get into motion too, and to pull off the projects from transition labs to a broad range of options”*.

2.3. Climate action

Climate change remains among the top three concerns of Europeans. An overwhelming majority support action across the EU to tackle the climate crisis and make Europe the first climate-neutral continent, according to the latest Eurobarometer survey by the European Commission (April 2023). 93% have taken at least one specific action to fight climate change, such as:

- Bought an electric car from 3% (1% in April 2019)
- Installed solar panels from 9% (6% in April 2019)
- Bought a low-energy home from 4% (5% in April 2019)
- Have switched to an energy supplier which offers a greater share of energy from renewable sources than your previous one from 10% (12% in April 2019)
- Have insulated your home better to reduce your energy consumption from 17% (24% in April 2019).

In the last 6 months at least one specific action to fight climate change has been taken by 63% (60% in April 2019). Around one in three have taken action by changing their diets, specifically by buying and eating more organic food (28%) and buying and eating less meat (31%). Three quarters of respondents agree that taking action on climate change will lead to innovation that will make EU companies more competitive²¹.

2.4. Citizens’ participation crisis

This crisis of participation has been particularly important in recent years. Adopting a broader scope, there is currently a large debate at European level on citizens’ engagement and the crisis of democratic participation. This debate includes the issue we are discussing in this section. Reference can be made, in this regard, to different documents that highlights the way in which the so-called “participation crises” affects policy implementation²².

²⁰ Vadén T., Majava A., Korhonen J.M. and Eronen J.T. (2023) Energy Without Russia - The Consequences of the Ukraine war and the EU Sanctions on the Energy Sector in Europe. Friedrich-Ebert-Stiftung. Available at: <https://library.fes.de/pdf-files/bueros/budapest/20613.pdf>

²¹ European Commission (2023) Climate change. Special Eurobarometer. Available at: https://climate.ec.europa.eu/system/files/2023-07/citizen_support_report_2023_en.pdf - Scotland (and therefore Outer Hebrides) was not involved in this survey.

²² https://ec-europa-eu.libguides.com/engagement_democracy/crisis

A contextual phenomenon reported frequently by the RIPEET territorial partner in Extremadura and to a lesser extent in Outer Hebrides (rarely in Ostrobothnia) is called “citizens’ participation crisis”. In recent years, citizen participation appears to have weakened after decades of intense participation²³. Previously, significant numbers of citizens in Spain (but not only) have more or less intensively participated in instances of bottom-up governance or dialogue with local authorities (among other in the energy sector), spending time, effort, and sometimes money. In the vast majority of cases, however, they would have gained no benefit (or very little benefit) either for themselves or in general. Many, therefore, no longer believe in the importance of participation and, therefore, mostly do not participate. The Covid pandemic wasn’t helpful in this respect either. Nevertheless, according to the RIPEET core team in Extremadura, in RIPEET, citizens have shown more interest than in other types of projects. Due to its importance in recent years, there is currently a widespread European-level discourse concerning citizens’ engagement and the challenges faced by democratic participation²⁴.

2.5. Energy communities / broad active citizenship in the energy sector

In contrast to what has just been said, it should be noted that regarding the specific issue of energy production, management, and consumption, over the years of RIPEET implementation, citizen participation has increased considerably in the management (production included of energy). This was facilitated, among other factors, by the adoption of the new RED III Directive on renewable energy (Directive 2023/2413) by the European Commission. This directive amends Directive 2018/2001 and was published in the Official Journal of the European Union on 31 October 2023. Among others, RED III entails streamlined procedures for the installation of solar systems and wind farms, as well as for the modernization of existing ones. This directive further strengthens the European Commission’s push towards greater diffusion of Renewable Energy Communities/RECs (and more or less similar schemes such as Eco-Villages) which lead to the grouping on a territorial basis (mostly small or very small territories) of actors such as families /citizens, micro-small businesses, schools/universities, municipalities for the production and management of renewable energy. Throughout the implementation period of RIPEET, numerous RECs emerged in certain European countries, exemplified by Spain and Italy. These communities were established at the condominium level, or through the clustering of residences and families around educational institutions, universities, municipalities, or even micro-small businesses, potentially numbering in the dozens or even hundreds. Some of these RECs are also solidarity-based, in the sense that they also include, among their members, vulnerable families/citizens in situations of energy poverty and/or donate profits from the production of renewable energy and from the exchange of energy with the electricity grid, to social projects in favour of disadvantaged people.

²³ https://local-social-innovation.eu/fileadmin/user_upload/SMARTEES_D_3.1_social_innovation_in_action.PNG

²⁴ https://ec-europa-eu.libguides.com/engagement_democracy/crisis

3. Regional impact

The most comprehensive and insightful assessment we can provide in this overall impact evaluation has to adopt a territorial case study approach, supported by the data collection methods outlined earlier (refer to §1.5.). Additionally, by employing evaluation methodologies and concepts, the analysis should facilitate the improvement of local stakeholders' engagement, transforming it into a formative assessment. Below, we outline the territorial case studies, which contextualize descriptions per territory, presented in chronological order of pilot experiments within each territory (alongside subsequent territorial RIPEET activities in each region). This is followed by a compilation of observed changes attributed to RIPEET interventions and concludes with insights derived from both our team leading the monitoring and evaluation (M&E) efforts and our regional partners.

3.1. Extremadura

Contextualisation

Spain's energy innovation landscape faces challenges, with R&D expenditure below the OECD average and limited collaboration between research entities and industry. Extremadura, characterized by lower Gross Domestic Expenditure on R&D and GDP than the national average, grapples with a unique set of demands. While it aspires to be carbon neutral by 2030 and embraces renewable energy, there's a notable lack of awareness, particularly in rural areas.

Extremadura's policy mix displays a distinct inclination towards building and nurturing niches, emphasizing regional networking, especially at the EU level. This focus on international collaboration is evident in initiatives such as the green hydrogen round table. However, the networking spotlight tends to overlook regional innovation actors. Policies tend to lean towards regulation and legislation, with a notable emphasis on subsidies for renewable energy and energy efficiency. While this legislative focus may expedite the transition to renewable energy, it lacks sufficient provisions for democratic energy structures and citizen involvement.

The path from initial reflection to needs identification in Extremadura involved several key actors and steps. First, the Transition Lab team, consisting of staff members from regional partners FUNDECYT and AGENEX, led the Transition Lab in Extremadura. This team, formed as part of the RIPEET project, organized the backcasting workshop. The workshop, held online in May 2022, involved 12 participants, and followed a structured agenda discussing steps and actions for the short-term (2022), medium-term (2030), and long-term (2040).

The Extremadura energy vision for 2040 was outlined, including change targets such as citizens producing their own energy (change target 1) and the development of energy communities in each municipality (change target 2). The current situation for these change targets was described, indicating the need for increased commitment and support. The jointly developed transition pathways integrated actions related to awareness-raising and support, training to improve territorial capacities, and political adjustments to achieve the envisioned future. The core elements of the developed transition

pathway included awareness-raising and support, training to improve territorial capacities, and political adjustments to boost more social and sustainable solutions. These elements involved actions at various levels, including information and dissemination programs, training programs, and political adjustments to support the development of new energy projects.

The RIPEET Needs Definition Workshop brought the regional stakeholders together to identify critical gaps in Extremadura's energy innovation landscape based on the identified change targets. It highlighted the most urgent need: the establishment of more democratic energy models. Stakeholders expressed a desire for increased general knowledge on energy issues, enhanced collaboration between key actors, and the promotion of new energy solutions. A key observation was the lack of awareness, particularly in rural communities, regarding sustainable energy and concepts like energy communities and self-sufficiency.

Extremadura's energy vision extends beyond legislative measures, emphasizing the need for societal transformation. Stakeholders emphasized the importance of citizen involvement and education, echoing principles of Responsible Research & Innovation. While the policy mix showcases strengths, including regional networking, the lack of citizen-focused initiatives and collaboration with civil society remains a gap. Recognizing this, the Extremadura Circular Economy Strategy aims to involve citizens in its implementation. However, this emphasis is not pervasive in other policy documents, hindering the region's progress towards a just and sustainable energy system.

Pilot process

The main challenge identified in Extremadura at the end of the process described above has been drawn in the following way in the call for solutions issued on September 15th, 2022.

“According to the innovation needs identified, to achieve the changes desired for 2040, new spaces, tools and resources with which citizens can play a leading role in the definition of the Extremadura energy transition are needed. This, in order to facilitate the identification of the main social challenges in the field of energy and favouring the development of new, fairer and more sustainable solutions, paying special attention to the Energy Communities Models. These spaces should serve as a unique meeting point between the main stakeholders in the region, boosting collaboration between them and facilitating access to relevant information to enable the active participation of citizens in the energy transition process. The resources and information provided in the spaces must be adapted to the characteristics of the region and understandable by all target audiences. Citizens involved and committed to the energy transition process are the guarantee that structural changes²⁵ will be more effective and long lasting.”

²⁵ “Structural change” refers to profound modifications in order to pursue pervasive and definite objectives (e.g., a consolidated energy transition at the local level) thanks to a process of social change that should be (at least ideally) irreversible (e.g., cannot be easily reversed), comprehensive (e.g., comprehensive modification of the local life, affecting cultural and cognitive attitudes of citizens and local leaders, daily behaviours and practices), and inclusive (e.g., a collective effort involving all the relevant players and stakeholders within the involved territory/system, from the leaderships to the citizens, including, of course, all the vulnerable actors). To be effective, the structural change should entail an agency mobilisation of all the concerned stakeholders and players and a negotiation process among them for building a consensus on what to do, with what objectives and how. See SMARTEES-Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability-Report D3.4 (2019). Report on Five Models of Social Innovation. Available at: <https://local-social-innovation.eu/resources/deliverables/>

Based on this challenge the call-title was “Increasing general knowledge on energy issues, fostering collaboration between key actors and promoting the development of new energy solutions for the benefit of society”.

The main impact of addressing this challenge should “be the development of new socially led energy projects. Although the main target group is the general public, the other stakeholders should also play a relevant role; academia providing the necessary knowledge for the development of new solutions; industry developing these solutions and introducing them into the market; the government developing policies that favour social energy projects; and environmental experts accompanying the whole process to ensure the lowest possible environmental impact”.

Seven proposals were received in Extremadura before the deadline in relation to this call for solutions (6 from Spain and 1 from Ukraine). Six proposals were considered eligible (the 7th not eligible since they proposed activities to be implemented in Ukraine). The evaluation started at the end of November 2022 (evaluation committee having 4 people, 2 from the RIPEET core team + one “scientific” expert + one “calls” expert) and ended before Christmas 2022 with the selection of the proposal “EnLuces – Promotion of Energy Communities in Extremadura”, submitted by the EnVerde Extremadura Energy Cooperative. The other proponents, including those participating before in RIPEET activities, accepted the evaluation committee’s decision without any trouble.

EnVerde defines itself as “A cooperative citizen project that arises from the union of people who live throughout the territory of Extremadura and who are united by the conviction that another energy model is possible: a distributed, horizontal model and in the hands of people. We want to produce and consume 100% renewable energy, to regain control over this basic good and be an alternative to large electricity companies. To do this, we are going to help create energy communities throughout the territory”²⁶. As has been noted in numerous RIPEET meetings (both Bi-Monthly-Monitoring Sessions and the final “impact session”), there is an almost perfect identity between the nature of EnVerde as an entity and RIPEET’s call for solutions in Extremadura. Or, in other words, it can be said that by responding to the call for proposals, EnVerde actually contributed to implementing its goals.

EnLuces entailed the development of new spaces, tools and resources with which citizens can play a leading role in the definition of Extremadura’s energy transition, favoring the development of new, fairer and more sustainable solutions, paying special attention to the Energy Communities Models. The “solution” implemented by EnVerde was intended to (i) create a network of energy community promoters, which will serve as disseminators and referents in their immediate environment, and (ii) create a virtual space for dissemination, training, and consulting, that allows the interaction of people, the participation of all social agents and communication between institutions, companies and other regional stakeholders.

²⁶ “Un proyecto ciudadano cooperativo que surge de la unión de personas que viven por todo el territorio de Extremadura y que están unidas por la convicción de que otro modelo energético es posible: un modelo distribuido, horizontal y en manos de las personas. Queremos Producir y consumir energía 100% renovable, para recobrar el control sobre este bien básico y ser una alternativa a las grandes eléctricas. Para ello, vamos a ayudar a crear COMUNIDADES ENERGÉTICAS por todo el territorio”. Cfr. EnVerde Cooperativa Extremeña de Consumo de energía renovable – Cooperativa de consumo de energía renovable (energiaenverde.com).

In this frame, three trainings were expected:

- Training targeted to the staff of local public administrations
- Training opens to all type of citizens interested in playing a key role as “promoters” of energy communities
- Training targeted to all energy consumers focused on increasing general knowledge on energy efficiency and savings.

The “solution”, at the end of the pilot, should reach the entire region of Extremadura with at least one person involved in each territorial unit called “comarcas”.

The process of negotiation towards the grant agreement with EnVerde was relatively short, ending, substantially, with a public presentation in the Community Session held during the RIPEET General Assembly in Badajoz (January 24th, 2023). Formally, the Grant Agreement was signed in January 2023.

The Kick-Off Meeting was held on March 1st, 2023. It entailed an introduction on RIPEET and on what a co-creation process can look like; a discussion on the roles of each actor and on how to implement the selected “solution”, going in further details into the initial steps (the goal was reaching a wide consensus and then being able to start the implementation). 15 people attended; a few having already participated before in the transition lab process; and some other “new”, interested in the territorial development of the solution (people belonging to territorial administrations “mancomunidades”) for setting-up the “red de promotores de la solución” (participants knowing the people living in the territory that should/could be interested in the energy communities). The meeting was not fully satisfactory: a very interesting discussion, however too “open” and without established (agreed) milestones. Tools to get information were not well prepared for informing the design of the “solution”.

That said, activities started satisfactorily, also thanks to an intense monitoring action from the RIPEET partners, entailing frequent contacts (once a week) and with EnVerde delivering an implementation report every 15 days.

At the end of July 2023, the platform “Virtual space for dissemination, training and consulting” was set-up albeit having some issues on the contents and the operating mode that were solved later. Part of the contents of the platform were already public (general contents on energy communities, how to implement energy communities, etc.) and the platform started a network process with the aim that the involved actors get to know each other. On the other hand, the network of energy community promoters was not set-up at that time, despite the many meetings already being held in the various communities in the region. So, further meetings with local actors were held in the following weeks.

A concern was (and still is at the time this Deliverable was drafted) the political change in Extremadura (see §2.6.) bringing a new regional government less favorable to participatory projects (such as the Energy Communities) and also entailing some changes in people’s responsibilities at the local level (which generated some further difficulties in building the promoter network). Another concern was that the envisaged solution should be published at an appropriate level and with the right meaning (not done at that time – end July 2023).

At the end of September 2023, the platform was almost ready, having the first of the expected three training courses (the one addressed to Energy Communities promoters) on-line. On the other hand, the set-up of the network of Energy Community promoters was still under construction, since reaching the people in the territory proved to be something very difficult (and further complicated, due to the political change – see above). Moreover, it should be taken into account that:

- Promoters are volunteers in the sense that they will not receive money for this function nor from RIPEET, or from EnVerde and they should play this role given the work or social function (in the local territory) that they already carry out
- While it is true that Energy Communities are a rather well-known and widespread instrument in the North of Spain, conversely, in Extremadura they represent a novelty; so, it is very difficult to involve people.

Mid-December 2023, all the activities were implemented, also thanks to a weekly monitoring from the RIPEET partners and their very positive relations with EnVerde. The network of promoters had been built almost in its entirety, having its own people in almost all the “mancomunidades” of Extremadura and the platform was 100% operational with all expected online training. More specifically:

- The training opens to all type of citizens interested in playing a key role as “promoters” of energy communities, online since 25/09/2023, attended (end December 2023) by 76 people (belonging to 19 “mancomunidades”)
- The training targeted to the staff of local public administrations/city councils, online since 14/11/2023, attended (end December 2023) by 57 people from 36 localities
- The training targeted to all energy consumers focused on increasing general knowledge on energy efficiency and savings, online since 12/12/2023, attended (end December 2023) by 18 people.

It might be rightly noted that these last two trainings (particularly the last one) were put online quite late. This was due to having prioritized the quality and completeness of the contents of the training (reviewed multiple times by the RIPEET partners) over the timely release. We should also consider that the training course targeted to energy consumers (the last one to be ready) will continue to be online after the end of RIPEET. Moreover, it is expected that the platform will continue to work and to be accessible for ever (we will analyse this issue again in §5.1. on sustainability).

If only a few people attended the co-creation meetings held on August 29th, October 10th and December 12th (from 6 to 8 people per meeting), vice versa, participation in the presentation and discussion of the results and follow-up to be given to the pilot-action on 18th December 2023 in Badajoz was a real success: 26 persons, mainly representatives of territorial administrations (mancomunidades) and citizens or persons somehow connected with civil society (much less from Academia and from the Regional government²⁷), were the protagonists of a very lively discussion. This discussion, beyond the issues related to the follow-up and sustainability of the pilot-action and the RIPEET experience in general (which we will discuss in §5.1.), also dealt, more generally, on how it is possible to reach a more socially just and sustainable territorial energy transition, both environmentally and over time in Extremadura and how, in this frame, Energy Communities can be

²⁷ 1 person from the DG of Rural Development and 1 person from the DG of Cooperatives and Social Economy

relevant local energy solutions (e.g., the importance of focusing on what is done with the energy that is generated, in terms of wealth creation). Also talking about the technological solutions and institutional and management measures that would be appropriate to adopt. It has been also highlighted from a participant how the pilot-action has “reversed” the crisis of participation that has been experienced for some time in Extremadura (“The perspective of the development of a pilot has been an interesting claim to involve different actors. That the pilot is so accessible, through a web environment, has helped a lot to facilitate participation and expand the field of action”).

Pilot impact and RIPEET regional impact²⁸

The set-up of a much more favourable environment for the growing of effective Energy Communities in Extremadura is the main effect of the RIPEET pilot-action. Some (non-operational) energy communities already existed before, but now there is a routing in place, the constituent elements of which are:

- A network of trained people knowing what Energy Communities are and what to take into account to launch them (promoters)
- Public administrators at the municipal level also trained in this regard
- A few citizens more aware of energy efficiency and savings
- An information platform that should be constantly updated.

Although this routing is still in a nascent state, there are now some concrete initiatives that lead to the recognition of energy communities as a functional tool for the energy transition, but also for fighting energy poverty, given that energy communities can play an important role at this regard too (as has been stated many times during the implementation of the pilot-action, dealing with Energy Communities). More people are talking about energy communities and many more are listening. They have spread it in specific rural areas and discovered new stakeholders. Most of them are from environmental organizations, actively continuing their efforts to connect people.

We can note that all the above entailed pro-environmental behavioural changes are at the individual and family level (e.g., in saving energy, in using energy according to a more sustainable timeline) and at a collective level (e.g., in sharing information on energy efficiency).

Until now energy transition was focusing on the development of large plants, while thanks to RIPEET (without denying the importance of other factors such as the policies of the European Commission and Spain in this regard, and therefore the mobilization of further actors) the focus has been placed on the development of smaller solutions, such as the Energy Communities. This occurred by considering the perspectives of civil society and other actors and by developing skills – capacity building – in the people (promoters, public officials and citizens; so “a niche of engaged people group that can do something bottom-up together”) involved in the pilot solution.

²⁸ As far as possible, these 10 impact areas (without mention explicitly) are considered for this impact assessment: 1. Individual or collective pro-environmental behavioural change; 2. Access to affordable, reliable, sustainable and modern energy for all; 3. Communities resilience/vulnerability; 4. Public/actors engagement /Partnership; 5. Gender+/intersectional inequalities/social inclusion/equity; 6. Governance/policy commitment (energy sector / energy transition /R&I); 7. Science education/Communication; 8. Trans-disciplinary scientific advancement; 9. Trans-epistemic practices (Integration of local/traditional knowledge); 10. Stakeholders’ structural change.

If RIPEET had not existed, we would not have the structure and dynamics, the people and the processes, that we have now regarding the Energy Communities. Likely, in Extremadura, they might have been developing, but in a slower, disorganized, atomized, and uncoordinated way. RIPEET has helped integrate, articulate, accelerate and drive. In this way, RIPEET has also led to increasing attention towards the territory.

A further issue is connected to the Transition Lab, which has generated the pilot-action. The Energy Transition Lab has involved people who until now did not have a voice or who did not have communication channels to address energy transition issues. Specifically, the Transition Lab has allowed a greater outreach to citizens and social entities. The energy sector was disaggregated between companies, public administration and scientific community. RIPEET has made it possible to give citizens a voice and activate them as a dedicated actor in a quadruple helix, and even quintuple helix setting (so, an increase of citizen engagement and related responsibility).

According to the consulted stakeholders, this helps to accelerate the implementation of planned regional energy policies that had not yet been executed, and to have a more open and more inclusive energy system (so, a shift in the governance of the energy system or, in other words, a step towards a more transparent, participative and democratic energy system).

Moreover, RIPEET has significantly contributed to intensifying cooperation between actors (even if many people already knew each other before), leading many actors to talk or talk more with each other. Likely, without RIPEET, cooperation would have occurred, but in smaller numbers and in a more disorganized manner. And perhaps certain collaborations would not have taken place, such as those established between EnVerde and the University of Extremadura, between EnVerde and FUNDECYT-PCTEX or even between AGENEX and FUNDECYT-PCTEX.

Broadly speaking, in Extremadura, there was very little cooperation between energy sector actors before RIPEET. Now there is much more. The significant connections and exchanges between the actors can be considered as the third main change generated by this project. It entailed a lot of circulation of information, specifically information that was not circulating before. It ensured that much information went beyond the institutional contexts in which it was confined; it made sure that it circulated among everyone, collecting the opinions of the different actors (allowing feedback). Apparently, none of this happened before. The local communities are more resilient now that they have been (at least at an embryonic stage) equipped with methods and objectives as a result of their collaboration.

According to the RIPEET partners and the consulted stakeholders, the scientific community was not so involved (relatively intensively at the beginning, but then less and less significant). Academia disappeared when focus shifted to energy communities and related issues, so, there was no significant impact in terms of transdisciplinary²⁹ scientific advancement. Despite the creations of novel

²⁹ Considering transdisciplinarity as “a reflexive, integrative, approach aimed at the transition of societal problems, and concurrently of related scientific problems by differentiating and integrating knowledge from various scientific and societal bodies of knowledge”. Cf. Lang, D.J., Wiek, A., Bergmann, M., Stauffacher, M. & Martens, P. (2011). Transdisciplinary research

partnerships or connections between different actors from usually different sectors; these actors felt that they had and have a valid contribution to make. In general, academic actors in Extremadura need to find their role in transdisciplinary work, and not expect it to be 'business as usual'.

Whilst a change in behaviour has been initiated, no structural changes in the main energy actors can be identified. Not even in the organisations involved in RIPEET, albeit that individuals representing these organisations carry on their learnings. Nevertheless, one can still speak of an intense learning process on transition labs approach, co-creation, open calls, collaboration tools, ways of working. Moreover, raising awareness about the concepts behind RRI (although not necessarily in these words) has affected to a higher extent the organizations of the regional core team, and maybe to a smaller extent, other organizations participating in the regional transition lab, entailing effects to reinforce the importance of issues such as gender, public engagement, and responsible innovation.

3.2. Ostrobothnia

Contextualisation

Finland, committed to Sustainable Development Goals, aims for climate neutrality by 2035. While R&D investments are robust, the top-down innovation approach lacks directionality. Ostrobothnia, poised for renewable energy, mirrors this trend but faces a gap in aligning policies with local energy needs. The region does possess a strong energy innovation cluster, but this cluster focuses mostly on the global market. Ostrobothnia's policy mix leans towards building and nurturing niches, emphasizing industry-research networking and upscaling niche technologies. However, the top-down focus excludes significant engagement with citizens and civil society. The prevalent technology-centric approach, aligned with Finland's green growth paradigm, may overlook crucial non-technological innovations emerging locally.

In the Ostrobothnia Transition Lab, the backcasting exercise unfolded between 2022 and 2023, aligning with the RIPEET energy vision established through collaboration with territorial stakeholders. The Transition Lab team, comprising members from regional partners University of Vaasa, the Regional Council of Ostrobothnia RCO, and Innovation Agency Merinova, spearheaded the backcasting activities. The backcasting workshop that was facilitated online, conducted on April 7th, 2022, featured 15 participants representing diverse societal sectors, with an emphasis on civil society.

The RIPEET energy vision for Ostrobothnia in 2030 centred on decentralized energy production and consumption, emphasizing local solutions and impactful organization models. The main change target for 2030 focused on taking the organization of decentralized energy production and consumption to a new level, with a specified sub-change target of increasing the number of local solutions connected to local resources. Three interconnected core elements were identified in the vision for Ostrobothnia:

in sustainable science: practice, principles and challenges. Sustainability Science, [online]:<http://DOI10.1007/s11625-011-0149-x>. It should be added that: "To be transdisciplinary, research requires to comply with the following: (i) focusing on societal relevant problems; (ii) enabling mutual learning processes among researchers from different disciplines (from within academia and from other research institutions), as well as actors from outside academia; and (iii) aiming at creating knowledge that is solution-oriented, socially robust and transferable to both the academic and societal practice".

- Supporting citizen-led energy initiatives and local energy communities, empowering citizens in driving energy initiatives
- Supporting connections between regional actors, prioritizing knowledge-sharing, visibility, and networking among regional actors
- Policy development utilizing an RRI approach, establishing a link between local energy solutions and policy development.

The RIPEET need identification workshops in Ostrobothnia revealed a nuanced understanding of local energy needs. Stakeholders stressed the urgency for decentralized solutions to enhance self-sufficiency and alleviate energy poverty. They highlighted the limitations of current centralized policies, emphasizing the necessity of local energy initiatives to benefit from the regional energy cluster fully. During these workshops, stakeholders advocate legislative adjustments to recognize and support energy communities, enabling localized solutions. The dialogue also stressed the importance of aligning regional strategies with global socio-technical transitions, emphasizing the need for responsive and inclusive energy policies. In the end, the settled upon most urgent need was: More citizen-led energy initiatives and local energy communities in the region of Ostrobothnia, which was amended as follows to make it an appropriate title for the call for solutions: Energy solutions connecting local resources to local solutions.

While Ostrobothnia excels in fostering industry collaboration, there's a notable gap in addressing local needs in energy innovation discourses. Transformative outcomes on the national level overshadow regional ones, revealing a policy void. A focus on local implementation, aligned with societal needs, is vital for impactful innovation. Ostrobothnia's policy mix showcases strengths in fostering industry collaboration and innovation. However, a more balanced approach, inclusive networks, and a broader understanding of innovation beyond technology are essential to address local energy challenges effectively. The focus on local implementation, citizen engagement, and policy adjustments aligned with societal needs can bridge the gap between top-down policies and grassroots energy demands, creating a more resilient and responsive innovation ecosystem.

Pilot process

The Call for Solutions issued on September 15th, 2022 described the main challenge as follows.

"In the context of Ostrobothnia, the challenge of bringing in society to accelerate decentralized and local energy solutions set up by 2030 has been recognised as critical for the regional energy transition. We need innovative solutions connecting local resources to local solutions in energy production and/or energy consumption, e.g., heating, central or distributed energy production or storage, diminishing the use of energy. The journey towards carbon neutrality in Ostrobothnia, getting rid of the use of fossil fuels and basing the energy systems on green renewable energy, is connected to a need to work in new ways to engage different societal groups in finding energy solutions based on local resources."

Based on this challenge the call-title was "Energy solutions connecting local resources to local solutions".

Addressing this challenge, the solution “should succeed in enhancing citizen-led energy initiatives as well as increasing connections between stakeholders in order to develop the regional preconditions for implementing and scaling up local energy solutions based on local resources”.

Four applications were received in Ostrobothnia (all from local proponents). The evaluation started in the second half of November 2022 (evaluation committee having 4 people, 3 from the RIPEET core team + one from regional authorities) and ended early December. One proposal was rejected. Among the remaining, two got very high scores and were both funded. Both were considered functional to the policy, already pursued for over a year by the Ostrobothnia RIPEET core team, to give a voice to actors usually not included in these processes, in particular to communities in rural areas. Both have a “village approach”; while the other two (the rejected one as well as the one ranked at the third place) had an “engineering approach” and were formulated by “classical” consulting/actors working in relation to the energy sector.

More specifically, the two funded solutions are listed below.

1. “Rural Green Transition in Ostrobothnia – Case Älvbyarna”, submitted by Älvbyarna Village Association and Novia University of Applied Sciences, to be implemented in Älvbyarna (in Swedish) or Jokikylät (in Finnish), consisting of six small villages in the municipality of Korsholm. This solution is twofold: to expand the village cooperation into energy and resiliency questions, and to develop and test a calculation tool to help the villages make well-informed fact-based decisions about their energy solutions. From the tests, a handbook on village-level energy business models will be developed.
2. “Energy Village 3.0 – Ostrobothnia’s smart energy villages and communities”, submitted by Aktion Österbotten, to be implemented in Esse (In Swedish) – Ähtävä (In Finnish), a village in the municipality of Pedersöre. This solution consists in developing and piloting a new organisational model for developing strategies for smart energy villages that taps into the knowledge potential and local resources available. The model activates and enhances the capacity of villages and rural areas to deal with energy self-sufficiency and resilience.

One of the solution providers not chosen for funding complained against the decision. The complaint came after the query period ended and did not lead to any actions. At the end of the day, both other proponents accepted the evaluation committee’s decision without any further objections. It has to be said that neither of them had much involvement in previous RIPEET activities (unlike the representatives of the two funded proposals). Moreover, their proposals lacked a plan for co-creation of the solution with a broad stakeholder group.

With all the solutions’ providers the process of negotiation towards the grant agreement was relatively short, ending in January 2023 with the signature of the two grant agreements.

“Rural Green Transition in Ostrobothnia – Case Älvbyarna”

The group of villages “**Älvbyarna**” (villages of Anixor, Martois, Miekka, Staversby, Veikars and Voitby) already engaged in active cooperation in many fields, in order to keep the village life vivid (distance to

closest town Vaasa is about 30 kms). The special ingredient with the Älvbyarna is that in the villages there are existing local energy resources (hydro power, wind, and even solar power), some of them currently underused. On the other hand, Älvbyarna is one of the village associations that has a detailed Smart Village Strategy, and because of this they are chosen as a “lighthouse community” in the Finnish SmartRural27 network.

The kick-off meeting with the selected stakeholders (12 participants) was held on April 12th, 2023. The general feeling of the participants was that, as before in the Älvbyarna processes, the civil society perspective was heard and all the chosen civil society stakeholders played an active role.

The co-creation process during the first five months consisted of one meeting with solely civil society stakeholders, one seminar and lunch with a larger European reference group during the Vaasa Energy Week 2023³⁰, and, in the beginning the kick off meeting with the selected stakeholders.

It is interesting to note that the regional energy utility actor “Vaasan sähkö” joined the main stakeholder group, and an interested village citizen with deep knowledge of energy solutions in homes but who was not earlier interested in the village cooperation, joined the civil society stakeholder group. Thus, it can be assumed that the level of knowledge of civil society increased during the project. Two further co-creation meetings were held on September 26th and December 5th. Participation in all meetings was fairly satisfactory, according to the RIPEET partners (15 and 11 participants respectively) and included representatives of all the “helix”:

- Civil society representatives (Aktion Österbotten, i.e., the NGO network promoting the other pilot; Svenska Österbottens Ungdomsförbund, that is a regional umbrella organisation for youth associations; Finlands svenska hembygdsförbund, i.e., the Finno-Swedish heritage association and, of course, Älvbyarna i Östra Korsholm, i.e., the promoter of this pilot)
- The Municipality of Korsholm
- Stormossen, a local waste treatment and circular economy company that is jointly owned by six communities; and VASEK, the regional business and development company for the Vaasa region
- (of course, being the other pilot promoter) Several representatives of Novia University of Applied Sciences.

Generally, the implementation path included the co-creation process in this pilot can be summarised in the figure below. As we can see, beyond the three already mentioned co-creation meetings (including representatives of local authorities, business, Academia and civil society), there were in total 3 meetings during the implementation process, centred on civil society, and a number of informal meetings, all functional to expand the village cooperation into energy and resiliency questions (+ 3 formal presentations of the advancement/results of the pilot, during the Vaasa Energy Week in March 2023, the RIPEET General Assembly in Vaasa in June 2023; and in the “impact/reflection final session”, in November 2023 – see below). Thanks to these meetings and the many concrete discussions with experts, the pilot did provide (among others) clarity in the restrictions around full-scale energy

³⁰ <https://www.merinoa.fi/en/news/regional-news/energy-week-2023/#:~:text=The%20most%20significant%20international%20networking,%2C%20gas%2C%20and%20energy%20storage.>

communities in Finland and in what is required for societal actors to get involved in energy production in Finland as well as which form of energy production is the most feasible.

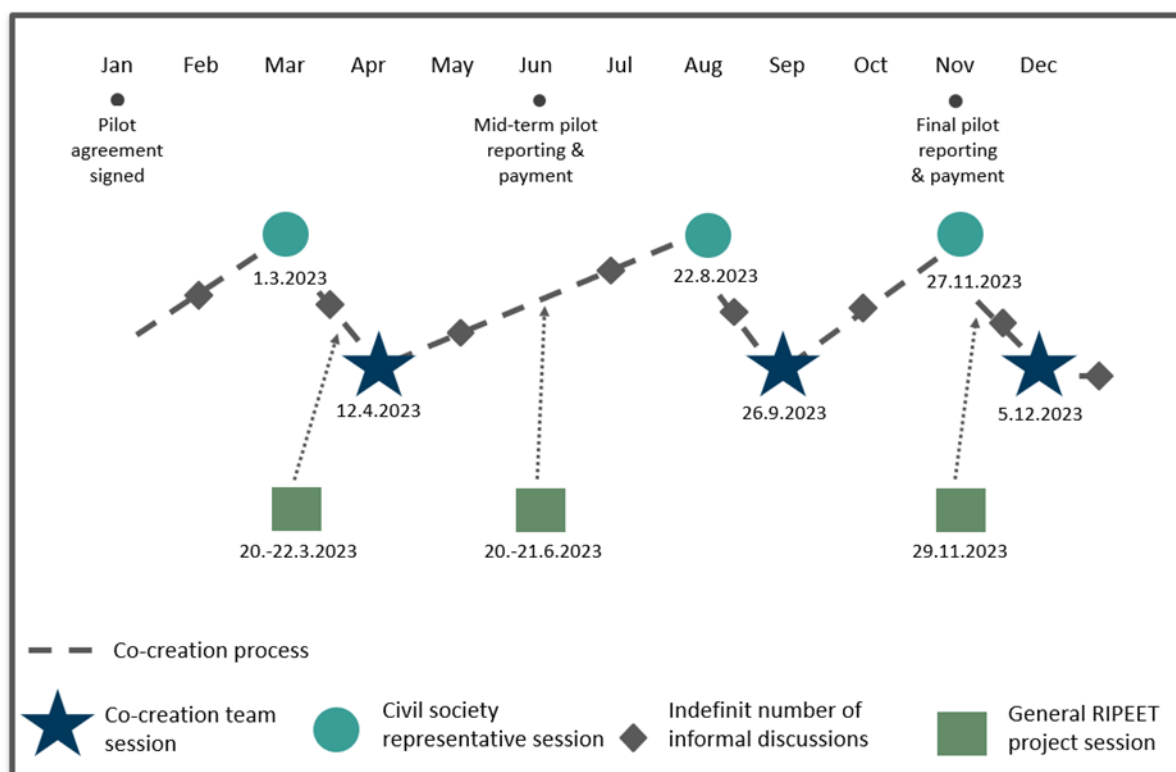


Fig 1 – The involvement of stakeholders during the implementation of the Älvbyarna case

Novia University of Applied Sciences contributed to the implementation of the pilot with the set-up of an Online calculation tool for sustainable energy systems for buildings (i.e., for costs for heating a house using different heating systems) to help the villages make well-informed fact-based decisions about their energy solutions³¹ (prepared with some delay, due to the problems at Novia University of Applied Sciences to hire personnel for the summer season) and a 15 page guide for business models for small scale energy production run by associations. It also provided some insights into sustainable heating of large houses. So, for the local community it highlighted restrictions and provided some clarity into how to optimise energy usage in large houses.

Thanks to the intense dialogue (in both qualitative and quantitative terms) between the participants in the numerous formal and informal meetings, the cooperation between the villages involved intensified significantly, and so has their capacities in managing energy solutions and therefore their social resilience has increased. The larger value of RIPEET was found in the discussions with other civil society actors on what the needs and wishes of civil society actors with large houses were as well as in rural areas around energy production. Identifying these needs and clarifying where the actual opportunities lie at this moment as well as later was important and could not have been done without RIPEET.

³¹ <https://heatingtool-prototype-367b745c73e0.herokuapp.com/?token=2e33a213-6ed8-40a6-b2f8-557a8c89a93e>

All the final results of the pilot were presented as part of a public initiative promoted jointly with the other pilot project on 10 January 2024 with 23 participants (mainly representatives of civil society and citizens).

“Energy Village 3.0 – Ostrobothnia’s smart energy villages and communities”

As already stated, the pilot-action “**Energy Village 3.0**” led to building village energy strategies that tap into the whole potential of skills and ideas in the village. The process to build the model of action collected tools and practices of villages within Ostrobothnia (so, the Ostrobothnian villages were listed and studied for best practices) and worked out an “ideal model” with one pilot village. The municipality of Pedersöre and the village of Esse/Ähtävä (distance to the closest town Pietarsaari is about 30 km) was chosen as pilot-village³². The first informative session was arranged on April 27th, 2023. The second session, the first actual co-creation workshop was arranged on June 19th, 2023 and dealt with Strengths, Weaknesses, Possibilities and Threats (SWOT) of the proposed concept. Both events were attended by 20-25 people, mostly coming from Esse and surrounding areas³³.

The further three co-creation meetings were held in:

- October 12th (Prioritization of SWOT; local people had to look and score the local strengths, weaknesses, possibilities, and threats and identify the most important combinations)
- November 8th (Inspirational visit to Spikas Kvarn³⁴)
- November 27th (discussion on perspectives and follow-up: “How to go forward from here? What do we need in the future for Esse to become a smart energy village?”, with a sketch of an action-program towards a Renewable production within the village).

A roadmap for becoming a Smart Village was drafted and is represented in the figure that follows. As reported by the solution’s provider if this pilot-action, during the on-site visit end November 2023, “we got to the 6 steps with Esse/Ähtävä, out of 9 steps”.

³² “Our first thought was to have an open call for villages to apply, quite fast we understood we were short on time. We put our heads together and talked to specialist Pekka Peura. Quite fast we understood Ähtävä (Esse) village is the best case due to the strong utility company, which is owned by the people in the village, the utility company acts at the national market”.

³³ The materials from these first workshops were uploaded into a padlet available at <https://padlet.com/pirittasyrjala3/RIPEET>.

³⁴ Spikas Kvarn (in English: Spikas Mill) is an investment project and an idea workshop for renewable energy and sustainable development at Spikas Rapid in Kronoby river.

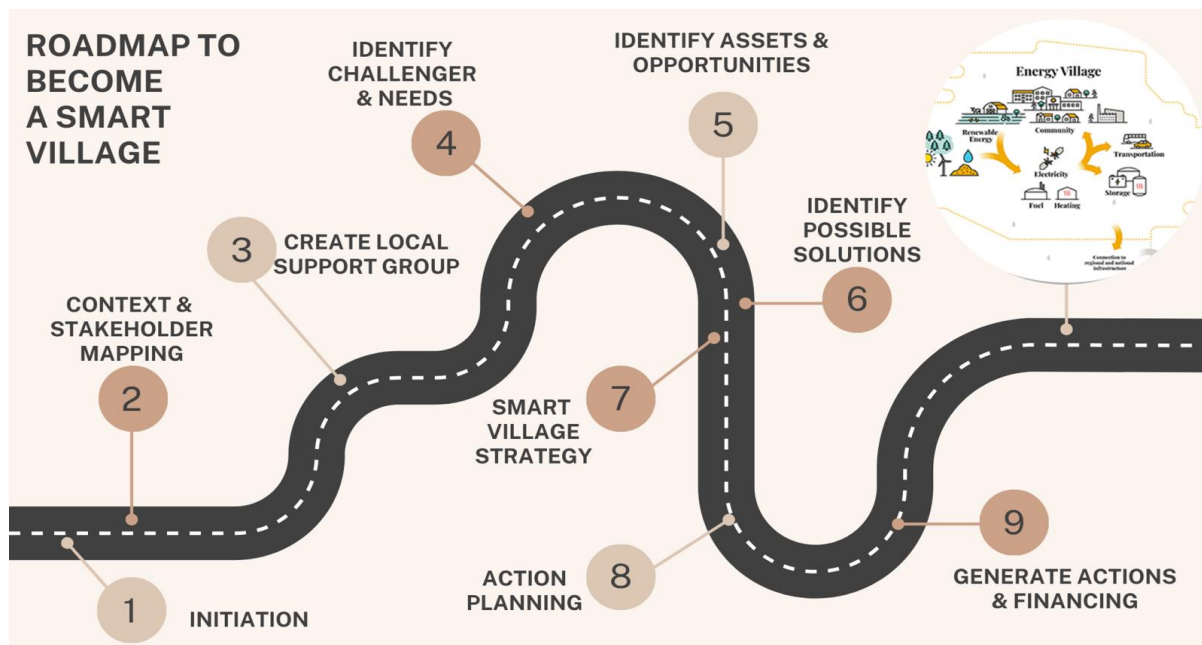


Fig. 2 – Roadmap to become a smart village.

Meetings were attended by 10/12 people. Co-creation process involved, beyond Aktion Österbotten, Esse Elektro-Kraft (Local power company³⁵), Esse Byrådet/Local Village council, Pedersöre municipality, the Regional Council of Ostrobothnia, Merinova, the University of Vaasa and the Novia University of Applied Science, and, of course, people from Esse (Ähtävä) and surrounding areas. The results did not always meet expectations, as stated by the Aktion Österbotten leader: “You must ask the wrong people to attend certain meetings to think out of the box and you might get new ideas” (as stated by the Aktion Österbotten leader). In Ähtävä/Esse village people were really interested in different solutions. They are now talking about and planning an Energy festival or exhibition.

As already stated, the results of the pilot were presented as part of a public initiative promoted jointly with the other pilot project on 10 January 2024.

Pilot impact and RIPEET regional impact

The impact of both pilot-actions (and more generally of RIPEET) in Ostrobothnia is substantial. Ostrobothnia’s starting position was relatively advanced, and therefore proved to be fertile ground to expand and build up pilot actions.

First of all, due to RIPEET, there has been a shift from a model of R&I in the energy sector (and, more generally, a model of governance) well-established in the region, based on the “triple helix” and thus on intensive cooperation between scientific research (academia), business and public authorities (e.g., regional council) to a model that tends to be increasingly focused on a “quadruple helix”, with the

³⁵ The utility company has been really interested in what has been done, having attended every meeting. Local people have a very strong belief in the local utility company, since it is owned by them, and the company is “giving money back” to the village and citizens.

inclusion of civil society and citizens³⁶. Local communities have shown a great potential to come up with sustainable energy initiatives, both in terms of needs, activities and pilots, and drive the energy transition from a societal point of view. Thus, RIPEET included society in the energy conversation that typically took place between industry, academia and the public sector.

Cooperation in the energy innovation field in Ostrobothnia has already been good for 20 years, involving the public sector, universities and companies. This was a regional strength. So, in that sense, the good conditions were already there. RIPEET adds the citizens' perspective and their main actors, civil society organisations into the energy innovation discourse and networks in the region, that now is listed in the cluster. Whilst most partners recognize the benefits of local solutions, not all understand the relevance that should not go to waste. For example, not everybody in the energy cluster already understands the benefits of the local solutions. At this time, big companies are learning the potential value of this type of interaction. By contrast, among the connections, an increased cooperation between SMEs and citizens should also be noted. Having in mind a corporate social responsibility framework, SMEs are starting to be 'speakers' on behalf of the communities. In Ostrobothnia, the role of academia was already much more supportive and committed.

It is essential to note that the relevance of civil society occurred by recognizing the importance of the people of rural areas and villages, and their (surprising) skills and potential in building local energy solutions. So, RIPEET, mainly through its pilot actions, contributed to include rural areas in the regional energy transition and helped to give a voice to people normally not listened to (despite being endowed with relevant skills and competences). As it has been highlighted by some stakeholders now, the concept of smart village works in terms of marketing. In this way, the region has demonstrated its participative, democratic, and inclusive qualities.

It is worth remembering that all the civil society actors (village associations and their networks) protagonists of the two pilot actions were not identified during the initial mapping implemented by RIPEET. Yet this mapping has had civil society as one of its pillars. These actors had escaped even a careful eye of the triple helix partners working together before, and also during the start of RIPEET, demonstrating how little they were known as possible actors of the energy transition (the initial organizational mapping was too limited including only the usual suspects since a lot of focus was put on current cooperation topics in the region at first). This is a further demonstration of the profound innovation brought about by RIPEET and its pilot actions (that should be considered as a social innovation per se).

The above development should also lead to an increased resilience of the involved communities (also thanks to activation of the learning process, local people learning that they can create local solutions together for energy needs). In this regard, it has to be underlined that thanks to the local initiatives it was possible to reach the most vulnerable people (old people, families with many children, etc.) that sometimes could have difficulties in the access to energy (essential also considering the extreme cold).

³⁶ It can be noted that, "at a smaller scale", the same shift also occurred considering the RIPEET partners in Ostrobothnia consisting of the University of Vaasa (Academia), Merinova (business), and the Regional Council of Ostrobothnia (public authorities). Aktion Österbotten was not only the promoter and executor of one of the two pilots but has in fact become a fourth regional partner of RIPEET through the stable and continuous participation of its leader not only in almost all RIPEET activities in Ostrobothnia, but also, starting from the second year, to almost all General Assemblies and other international RIPEET initiatives.

Municipalities have greater difficulties in providing essential services (and they are cutting). This is happening in health and education. Moreover, in an energy system consisting of renewable energy sources, the availability and price of energy will vary more; it could happen in energy. The two pilots went against this trend and focused on solutions for renewable energy production and solutions to address flexibility and resilience organised by the users. Thanks to these projects and what can follow, it is becoming possible to help and protect people, especially the most vulnerable, even in a climate crisis.

Both pilots provided tools for calculating economic benefits of using renewable energy resources. It is possible that the calculation tool that was created in the Älvbyarna case can help associations to lobby against financiers, so that funding opportunities will be created for associations on sustainable heating solutions. In case of such a result, it will have a significant positive impact on associations in a large area. These economic benefits will be realized through future actions in the areas.

In general, RIPEET has made it possible to bring together different stakeholder groups who would not otherwise meet to exchange ideas on how to achieve common goals (but who have different ideas on the subject). This led to an increase in trust between people, which was even more important after Covid. Several participants stated that “pilot projects represent a sort of Kick-off towards the future”.

Some people that were consulted at the end of the project felt that these developments represent an innovation in democracy, with an increase in transparency too. Indeed, the inclusion of a village perspective in the regional energy innovation discussion can be considered a democratic benefit. That also entailed innovation at the governance level. Through the experimentation, “normal people” turned into ‘owners’ of the energy transition and thereby also protagonists of R&I, with clear consequences in terms of individual and collective pro-environmental behavioural change. In Esse/Ähtävä village, e.g., local inhabitants now want to invest into more sustainable solutions they can implement together. They have started to talk about an “Ähtävä solution”, meaning that they have a strong belief in their own utility company, so if they will follow up and offer a solution about solar panels for example, the locals will buy it.

Moreover, presently, principles or RRI are being integrated in regional policy, which is becoming more inclusive with probable additional positive effects in terms of access to affordable and sustainable energy for all. This represents policy impact. Demand-driven innovation, a consumer perspective and local energy solutions are already addressed in the regional policies and the implementation of the RIPEET actions has RCO’s insights into actions needed; still, the RCO is starting a regional innovation network for participatory democracy in Ostrobothnia focusing on energy and other topics from a participatory and democratic viewpoint.

According to a few among the consulted stakeholders, there should be similar effects also at the national level, albeit limited.

Both pilot-actions, consequently, have led to an increase of competencies and skills in some rural areas of the region and so empowering rural communities. Thanks to the success achieved and having also strengthened village organisations and their networks, this effect should have repercussions in and could potentially spread to all rural areas of Ostrobothnia.

Through the pilot-actions, new connections were made (“a great way to break the silos”; “people met that normally would not meet”), which can also be highlighted as transdisciplinary experiences. This is absolutely evident in both the pilots: which one had a university (Novia University of Applied Sciences) and a village association (Älvbyarna Village Association) as its main protagonists; and the second has led to a follow-up project between University of Vaasa and Aktion Österbotten. Broadly speaking, both pilots brought together a territorial coalition or partnership for responsible innovation in energy/climate change.

The Energy Transition Lab process entailed a certain impact in terms of transdisciplinary scientific advancement, having been based on novel partnerships between different actors from different disciplines (promoting Interdisciplinarity), from different sectors, and from Academia, civil society, public authorities and even business. These partnerships led to an increased interest in science in the local communities; and an increased interest in villages as objects for regional research and development projects as well as to a better understanding of the societal challenges in energy/climate change issues for all. Moreover, the pilot-actions entailed also trans-epistemic practices through the valorization of local knowledge belonging to village people involved in co-creation. Establishing these collaborations between academia and civil society also opens a broader portfolio of funding instrument to support the energy transition from a social perspective.

Possibly, there is also a value for the local community to be represented in a European context as an actor which has something to contribute. This can be something to be proud of locally as well and it can be important both for the empowerment of local people as well promoting the area an interesting area to settle in, since these villages have shown initiative in bringing forward their development.

It is probably too early to talk about structural change among the energy sector players in Ostrobothnia. According to a few stakeholders consulted, process changes are currently more prevalent than structural changes. However, the fact that new, previously completely ignored players entered the energy innovation eco-system could generate changes that can be considered structural. In fact, particularly, the Regional Council of Ostrobothnia is now implementing a challenge-driven approach in orchestrating stakeholders and building up collaborative efforts, focusing on energy and other topics from a participatory and democratic viewpoint. It is a good sign that policy is taking up the responsibility.

3.3. Outer Hebrides

Contextualisation

In Scotland’s ambitious journey towards a 75% carbon emission reduction by 2030, the Highlands & Islands region, including the Outer Hebrides, emerges as a key player. While enterprise innovations, particularly in wind power, showcase progress, the energy transition’s scope extends beyond technology. Rural areas, such as the Outer Hebrides, demand socio-technical solutions that resonate with the unique challenges of their sparsely populated islands. The region’s policy mix reveals a predominant emphasis on building and nurturing niches. Strategic documents outlining future visions

and goals, such as the Outer Hebrides Carbon Management Plan and HIE's Strategy, take centre stage. However, while the policy focus is robust in the early stages of innovation, there's a noticeable drop in the number of measures as the innovation process advances. Expanding and mainstreaming niches, along with opening and unlocking regimes, show comparatively lower representation.

In the Outer Hebrides Transition Lab, the backcasting workshop was conducted online on April 19th, 2022. The workshop, facilitated by the Transition Lab team comprising employees from regional partners HIE and CES, focused on the years 2022–2040. Participants elaborated on the steps or changes needed to reach the change targets. Steps and changes were categorized under “Technical Changes,” “Social and Behavioural Changes,” and “Policy and Regulatory Changes”. The developed energy vision for 2040 aimed at addressing local needs, utilizing energy resources, and overcoming challenges like fuel poverty. The participants developed two change targets for the Outer Hebrides. For Change Target 1, addressing fuel poverty, the transition pathway included research on technical and economic solutions, strengthening supply chains, and creating a detailed Game Plan to coordinate efforts. For Change Target 2, addressing energy cost inequality, the transition pathway included monitoring and modelling the energy system, advocacy for policy reform supporting local energy supply, and creating a community wealth fund to resource initiatives and projects.

The needs definition discussion highlighted the key concern that, despite significant renewable energy resources, 40% of households in the region experience fuel poverty due to a disconnect between energy generation and consumption markets, primarily attributed to legislative barriers. This includes tackling challenges related to energy efficiency, costs, household income, and local energy generation. The aim is not only to meet governmental targets but also to empower island communities in combating energy poverty, echoing the Scotland Fuel Poverty Act's objectives. The most urgent need was thus formulated as: Explore options to reduce household energy bills by better utilizing locally generated energy.

The policy landscape in the Highlands & Islands showcases a commitment to green initiatives, network formation, and sustainable visions. However, the gap between aspiration and execution is apparent, with transformative measures needed to bring these plans to life. While early-stage innovations receive attention, the lack of broad contextual support for long-term sustainability raises concerns. Engaging with regime actors, shifting perspectives, and aligning interests are critical steps. The political emphasis on visions and plans for navigating regional expectations, highlights the need for contextual backing to ensure that promising innovations move beyond theoretical aspirations.

Pilot process

The main challenge identified in Outer Hebrides at the end of the process described above was, according to the call for solutions issued on September 15th, 2022, to reduce fuel poverty and to almost eliminate extreme fuel poverty (also having local energy costs on Outer Hebrides equal to those on the mainland). So, the stakeholders involved in the process, identified this most urgent step as: “Explore options for locally generated energy to be supplied and/or marketed locally and reduce household energy costs”.

This has been amended to the call title: “Explore solutions to reduce household energy costs by better utilizing locally generated energy”.

Addressing this challenge, the solution should produce results that could include:

- Advancing the innovative knowledge basis and/or technology base of the Outer Hebrides on local off-grid energy generation
- Developing a virtual model of the Outer Hebrides energy system
- Conducting research into the long-term economic impacts of fuel poverty in the Outer Hebrides
- Designing an innovative campaign for policy reform on local energy supply
- Improving the knowledge/technological basis for alternative fuel sources
- Showcasing new and improved means for insulating properties.

Five applications were received in Outer Hebrides (2 applications from local applicants; and 3 from applicants based outside of Scotland). The evaluation started in the second half of November 2022 (evaluation committee having 4 people, 32 from the RIPEET core team + one from university and one from local civil society organisations) and ended late January 2023. One proposal was rejected, since the bid submitted before the deadline was lacking in many aspects, whereas a much more complete and satisfactory text was presented a week later. The Evaluation Committee discussed the possibility to consider an extension, but at the end of the day, this possibility was rejected. There was concern from the Evaluation Committee that whilst the decision of an extension was made with the best of intentions, in extending the bid deadline to all applicants that had already submitted a bid there is the potential that the transparency of the process could be called into question.

The proposal “Outer Hebrides Local Energy Economy” was funded, submitted by a Consortium between the University of the Highlands and Islands North, West and Hebrides and Comhairle nan Eilean Siar (Outer Hebrides Local Authority). The solution aimed at identifying and overcoming barriers to developing a local energy economy; specifically selling locally generated energy directly to local consumers through existing grid infrastructure via a locally owned energy supply company (ESCo) or alternative solutions. An examination of the optimum energy efficiency solutions and domestic renewable energy mix for local houses was included in the proposal. Territorial scope of the solution was all the islands of the Outer Hebrides.

The process towards the Grant Agreement was very long and frustrating and ended only in April 2023. This was due to key staff in the solution providers’ team being off work due to illness in the early part of 2023. Input from this staff member was crucial in confirming the milestones and implementation details of the RIPEET pilot and to confirm that there was no duplication with existing regional projects. Time also had to be spent to avoid conflicts with the proposer who had submitted a complete proposal only after the deadline that was ultimately rejected.

The “solution” involved the implementation of six Work Packages, the first four by Comhairle nan Eilean Siar, while the fifth and sixth were implemented by the University of the Highlands and Islands North, West and Hebrides.

- WP1 – Project structure and regulation (Working with Ofgem³⁷, identify the extent to which regulation curtails the local energy economy, and identify how and to what extent the Outer Hebrides can disengage with the UK wholesale energy market, establishing the lowest tariff; and identify and establish the potential interventions that lead to wholesale market disengagement).
- WP2 – Energy storage (Work with existing community organizations to explore the potential of battery storage of locally generated electricity for the benefit of island communities; and to ensure no duplication of provision).
- WP3 – Networks (Gain a comprehensive understanding of local distribution networks, working with SSEN (Scottish and Southern Electricity Networks); Explore impact on regional grid of removing demand from Island consumers for electricity; and develop plans for a ‘whole-system’ approach).
- WP4 – Energy Supply Company (Develop ‘Hebrides Energy’ into licensed electricity generation company with functional local ‘back office’ and identify necessary resources; and Scope out economic benefits of locally supplied electricity and understand why Scotland-wide community energy generation plans were shelved).
- WP5 – Household renewables generation (review of household/community renewable energy options in 2023 to reduce household and community buildings bills).
- WP6 – Energy efficiency (review of household/community energy efficiency options -new build and retro-fit- in 2023 to reduce household and community buildings bills).

Although the start of operations was slow and the Kick-Off Meeting/first co-creation meeting (May 19th, 2023) was much more managed by the RIPEET partners rather than by the solution providers, the meeting was well attended by a variety of stakeholder groups. It was attended by 4 people of the pilot team and 11 stakeholders (some who already attended the previous Transition Lab meeting and some new stakeholders – people from local council, civil society, business, community sector, environment, academia). It was successful with a constructive discussion, receiving many inputs from the participants and reaching some relevant decisions for the implementation. It should be noted that, among the participants in that meeting, some had a history of tensions. Nevertheless, the atmosphere was, in that meeting, fully cooperative and productive.

The second co-creation meeting had to be rescheduled to be held on August 16th and little progress could be presented in almost all work-packages. It was preceded by a meeting between the RIPEET core team and the solution providers during which a critical analysis of the situation was carried out and measures were taken (e.g., project milestones and dates for delivering these milestones have been amended accordingly; request for additional staff; intensification of monitoring – and also support actions in implementation – by the RIPEET core team). The second co-creation meeting was well-attended (11 participants) and it represented an opportunity to discuss some changes in the milestones of the pilot-action.

In the months that followed, thanks to the additional staff and regular meetings with and assistance from the RIPEET core team, the speed at which activities were implemented increased considerably, which enabled the expected results to be almost fully achieved. The third (October 5th), fourth (November 7th) and fifth (November 24th) co-creation meetings were attended, respectively by 11, 8 and 10 people and the main findings of the implemented work were presented in Stornoway on

³⁷ The national regulator for gas and electricity markets in the UK

December 5th in a meeting with 24 participants (RIPEET partners, solution providers representing academia and local authorities, connected projects such as “Islands Centre for Net Zero” and “Carbon Neutral Islands”, and representatives from business and civil society; so, almost all the Outer Hebrides stakeholders interested in the delivery of the solution).

The discussion (partly in plenary and partly in working groups) was very rich and interactive. In addition to the issues related to the impacts produced and expected on the one hand and sustainability on the other, methodological issues and substantive issues related to the technology solution were addressed.

The methodological issues ranged from the sample size and scope³⁸ of the research on household and community renewable energy options in 2023 and energy efficiency to reduce household and community building bills, to the co-creation approach of RIPEET and the added value of Transition Labs and how they can serve in the future.

In relation to the second, issues such as:

- how solutions in energy efficiency should/could be tailor-made
- need for network modelling to determine options/parameters/limitations, routes outlined to developing a local electricity market that offers a reduced local tariff
- Outer Hebrides specific and bespoke solutions for domestic energy efficiency³⁹, heating, and energy generation.

Finally, related obstacles and opportunities (e.g., problems in the supply chain) and actors’ capacities/skills (e.g., on installation and maintenance of domestic renewable energy equipment or the issue that “assuring best community benefit will require education⁴⁰ and engagement”) were discussed.

Everyone, starting with the solution providers, has highlighted how the work carried out, beyond the interesting results, cannot be considered concluded⁴¹. Thus, future activities were discussed, that continue to build on the work done in the pilot, as well as the possibilities for project continuation (see also §5.1.) also during the sustainability workshop that was itself an opportunity for further advancement in the implementation of the pilot-action. The discussion touch upon sustainability issues related to the pilot and RIPEET in Outer Hebrides, and among others, with:

- The feasibility of the different routes outlined in the pilot to developing a local electricity market that offers a reduced local tariff⁴²

³⁸ This study was done on a broader region (than Outer Hebrides) by master students.

³⁹ What is the most popular efficiency measure on the islands? What measures are considered most (Solar PhotoVoltaic; thermal and wind)?

⁴⁰ More specifically, it was highlighted that “There is education needed for solutions that are highlighted in the research on household/community renewable energy options in 2023 and energy efficiency”.

⁴¹ In a wide meaning. In terms of accomplishments, the Evaluation Committee collectively agreed that all project milestones have been met during a meeting held on 10 January 2024 (achievements and deliverables).

⁴² Among the 4 main models (Ripple Energy, Octopus Fan Club, Energy Local Club, Urban Chain) analysed in the pilot-action, the two agreed, by the participants, to potentially be the most feasible were Ripple Energy and Energy Local Club (and various rationales for it have been provided).

- Additional approaches or initiatives (not already discussed by the pilot) that could support achieving a local electricity market that offers reduced local tariffs
- Which organizations should lead in developing a local electricity market
- Which additional research projects are needed⁴³ and which organisations should lead, be involved, carry out the research underlying the importance to have local ownership (“a local, independent board should lead this research and potential pilots”; “the organisations involved should be local because they are known and trusted by the local populations”; “working under a local coordination home energy board”; however “Energy models are quite innovative needs joining up with folk out of the region; so there is the need to tap into expertise that is out of the region”)
- The need for more local advisors and auditors with knowledge about the Western Isles appropriate to ensure good quality solutions
- Additional funding opportunities (e.g., the National Lottery was identified as a potential funder for the establishment of a new social enterprise for local domestic energy installers).

Pilot impact and RIPEET regional impact

The first effect of RIPEET was to generate a new configuration of relations between energy actors in the Outer Hebrides (in other words, a repositioning of these actors), entailing:

- An improvement of relations between these various actors, with a greater collaboration with the SEN. Cooperation between energy sector actors did exist before RIPEET but mostly on a bilateral basis, occasionally with friction. Since the kick-off meeting of the pilot action, the atmosphere has been cooperative and productive, notwithstanding some historical tensions
- The active implication of multiple previously uninvolved actors. Previously, there was mainly cooperation between commercial actors and civil society and other stakeholder groups were ignored in policymaking. RIPEET “imposed” cooperation with several other actors and, through the pilot-action, a wider variety of opinions on the necessary actions were collected
- The strengthening of regional collaboration with a greater connection between the North and South of the Outer Hebrides.

RIPEET succeeded to put people together to work towards the ultimate goal of the energy transition. As a result, stakeholders involved in the Island Centre for Net Zero (ICNZ) project, which was several months before the end of the project, had already met each other and had gathered experience in collaborating with each other.

More specifically, RIPEET allowed the involvement of people not traditionally involved in energy poverty issues (as well as in other issues also beyond energy, such as transport). In this regard, RIPEET has created a “lobbying group/special interest group” facing the main issues affecting the Outer Hebrides, which was missing but now offering a good contribution (e.g., in the framework of the on-going projects, such as ICNZ).

⁴³ e.g., looking at: to look at: Western Isles specific tailor-made solutions for domestic energy efficiency, heating, and energy generation; affordable solutions and tailor subsidy schemes; community innovative energy solutions for domestic; smart meter signals, installations, and access to families; community innovative energy solutions for domestic needs; specific and bespoke solutions for domestic energy efficiency, heating, and energy generation; suitability of applying the Ripple Energy or Energy Local Club model in the Outer Hebrides (see the previous footnote).

Having solved certain underlying tensions, RIPEET has also led to the construction of a shared vision and a roadmap. The vision of a local energy economy was not new to the island, however it is a novelty that all actors agree on the necessary steps to achieve this vision.

Consequently, the energy sector governance is now more shared among the many players in the quadruple/quintuple helix. Experiences of collaborating together has increased the recognition of opportunities and the perception that change can be achieved in collaboration with each other. In sum, according to the consulted stakeholders, RIPEET has been a catalyst for things to move forward, notably by bringing actors together.

Moreover, bringing actors together has entailed a (partial) shift from predominantly bilateral forms of communication to predominantly multilateral forms of communication; as well as an increase in partnerships among the various actors aimed at “building] experience in putting things in practice”. However, these partnerships heavily relied on a few individuals implementing the bulk of the work and maintaining the network. Academia, policy, and certainly industry was more distantly involved than sometimes wanted.

Arguably, these partnerships entailed a certain impact in terms of transdisciplinary scientific advancement through novel connections between different actors from different disciplines and sectors, at least, from academia, civil society, and local authorities (the “re-establishment” of the connection between science actors and senior stakeholders). This has increased relevant knowledge exchange among diverse experts/people of the energy sector; and these actors feel that they had and have a valid contribution to make. More specifically, the RIPEET core team and stakeholders involved in the Transition Lab and co-creation have developed a closer relationship with the University of Highlands and Islands. This has helped to raise the profile of key local issues with local academic partners. As a result of its involvement in RIPEET, the University of the Highlands and Islands has now started to offer a Master of Research in Sustainable Development, recognising the importance of the local issues raised by the Transition Lab.

According to the stakeholders consulted, all of the above have, among other things:

- Made changes possible in the way of thinking and conceiving the problem of energy (and energy poverty)
- Facilitated the circulation of information/specific knowledge and learning processes between the various actors (brought experience back to own organization)
- Allowed the identification of shared solutions to be undertaken in order to change at the local level to enable the energy transition and the fight against energy poverty (broadly, in the implementation of the wider energy agenda)
- Facilitated better direction of the policies carried out by local authorities in this regard
- Contributed to alleviate the Community-government-commercial electricity provider divide.

However, these changes are not yet consolidated as stated by several interviewees: “the transition lab and pilot has moved in the right direction, but it is fragile”; “A more systemic, holistic approach is needed”; “Not everyone accepts”. And the impact on policies has however been minimal, so far as it is normal, due the little time elapsed.

Several stakeholders also noted that RIPEET in general and the pilot-action in particular contributed to the rise of energy poverty awareness; but several others have noted that this depends largely on the international context (see §2.1.), regardless of RIPEET. Certainly, however, RIPEET helped the existing local initiatives in this regard. As stated by one stakeholder, “The policies related to energy poverty and any other development policy in Outer Hebrides were initiated only from Glasgow or from London. RIPEET has changed this”; and contributed to highlighting the energy cost discrepancy between island and mainland.

Finally, the implementation of RIPEET has provided useful experience, examples and tools to regional projects such as the ICNZ, which will continue to support demand-driven innovation and development in the Outer Hebrides. The experience of local partners in the RIPEET will directly feed into planning of ICNZ funding and project development models.

No structural changes or reorganizations have been observed in the main organisations (institutions) of the energy sector actors as of the time of writing this deliverable, including within the RIPEET partner organisations. It could happen in CES, which through his commitment to ICNZ will continue on the path embarked upon (the ICNZ project will adopt aspects of the RIPEET Methodology within its business model – see §5.3.). Nevertheless, in both (CES and HIE) there was an improvement of competences (there will be organizational reflection and then there might be more opportunity for this).

4. RIPEET reflection

4.1. RIPEET's overall impact

The main aim of the RIPEET project was to improve opportunities for (small scale) sustainable energy innovation practices (policy, stakeholder collaboration culture) in the region by interlinking Responsible Research and Innovation and territorial innovation (smart specialization) models. It did so through the implementation of three territorial Transition lab experiments in Ostrobothnia (Finland), Extremadura (Spain) and in the Outer Hebrides (UK), which fostered collaboration between actors regionally, and increased the general knowledge on how to co-create transformations.

RIPEET applied RRI principles and approaches such as cross-sectoral collaboration and co-creation in the policy and innovation process, not only contributing to more sustainable energy and transformative approaches but also to more socially desirable and inclusive participatory practices of citizens and environmental representatives. With these processes, the project aimed at contributing to more open, transparent and democratic R&I systems in the engaged territories and beyond, creating societal, democratic, environmental, economic and scientific impacts as well as tackling transformation processes of the organizations involved.

In this context, the three Transition Lab experiments, along with their pilot actions, can be viewed as participatory action-research initiatives centred on inclusively engaging territorial actors within the local energy innovation ecosystem. These endeavours also focus on societal engagement in need identification, fostering and sustaining cross-sectoral collaborations for co-creating innovative responsible solutions. Additionally, they address the transferability of a validated methodology/model to other regional settings through communities of practice. Finally, the efforts extend to co-evaluating the main results and ensuring the sustainability of both the achieved outcomes and the initiated process at the local level. In all three regions, RIPEET's impact has moved from dialogues among stakeholders in particular with civil society, via translation and common understanding, to initial and sometimes more advanced steps in governance of systemic change. However, for this to last, scaling up (both in pilots as in capacity building), resources, and (some) flexibility are needed to maintain and further expand the outcomes and impacts of RIPEET. Critical conditions for this to happen are trust and mutual empowerment.

In the previous Sections, this report comprehensively describes the main results per region, derived from the final evaluation exercises based on the feedback received by territorial stakeholders as well as concrete results obtained by the experiments and by the project as a whole. Here, the overarching findings are presented. This is structured around the following 'what and by whom' questions.

1. How has regional collaboration in the energy sector changed in the RIPEET project? What sectors collaborate more? And more specifically, how are the skills and networks built in the RIPEET project ingrained in the region?

Capacity-building: In terms of changes to skills and expertise, RIPEET contributed to an increase of collective stewardship by a relatively small group of key actors that increased the quality and intensity of the pre-existing and new relationships. This permeated to otherwise isolated local, rural communities. Initially there was a lot of bilateral communication, while thanks to RIPEET multilateral exchanges have intensified considerably. As such, while RRI required a lot of transductions from local and regional partners, the concept of co-creation was widely adopted and implemented through regional partners and adjacent networks.

Enduring connectivity: In terms of changes to relationships and trust, RIPEET has contributed to strengthening and repairing external partnership relations. The transition labs started with small-scale communication, but the need for building broader collaboration became evident quite soon. Over time, the actor networks and new connections resulted in heterogeneous, inclusive networks. In general, the regional labs gave access to relevant policy communities aiming for a more trusted engagement of policymakers, especially in Extremadura and Outer Hebrides where policy makers were hard to engage. The initial organizational mapping was too limited and included only the known actors (through documents and stakeholders), but excluded unknown actors, such as rural groups in Ostrobothnia (and their networks); broadening was needed (and done during the implementation of RIPEET) to also include these actors, in particular some relevant grassroots actors/networks. This was recognized by the regional partners in an early stage and overcome by also inviting non-usual suspects interested or impacted by the energy transition to co-creation sessions. In particular, the local energy communities benefited from the engagement. Industry and academia were difficult to reach, except in Ostrobothnia where the Triple Helix was already functional, and now has extended to a Quadruple helix network with Civil society.

Instrumental: In terms of changes to plans, behaviours, decisions and actions RIPEET has contributed to the planning of durable collaborative spaces for energy innovation deliberation with citizens and local communities. In their methodological approaches, the RRI-way of working through co-creation was widely adopted. It was commonly agreed that the pilot actions are instrumental to keep networks afloat, and to maintain them as a forum for exchanging ideas and building coalitions for change.

Culture: In terms of attitudes towards knowledge exchange and practices, RIPEET has contributed to increased access of territorial and societal stakeholders to the energy innovation ecosystem. Similarly, attitudes towards democratised innovation processes have been positively sensitized, maybe also due to the global political and energy trends. There is a positive recognition and empowerment of grassroots organizations in environmental issues as well as in issues regarding energy transition, such as through the contributions of energy communities.

2. Which stakeholder groups (quintuple helix) learned or changed practices due to the RIPEET project? And more specifically, how difficult was it to engage the different stakeholder groups in the RIPEET process?

Stakeholder analysis in the transition labs of RIPEET and in the wider region shows that change is dependent on a small core group that brings together and sustains the network. Regional policy agencies, when aligned well, are instrumental in creating participation as institutions – and not ‘individuals’, also changing policy strategy to be more inclusive. But if policy is less engaged, only listening in, it is more difficult to broaden out. Academia may be interested but this is often research oriented, and not as project leads, which is what actors in a well-functioning triple or quadruple helix would do. Lack of resources may explain this, like for companies that often have different priorities. As said, the big, globally operating energy companies, and national grids, do not allow for very local or regional industrial core activities. In general, all region’s awareness on the benefits of multistakeholder collaboration and co-creation has increased. Working in a transdisciplinary way thus requires sustained support, even when the benefits are readily recognized. There is a risk of fading interest in transition labs beyond projects’ lifetime. The needs that need to be addressed to maintain co-creation are presented in Section 4.2. in more detail, and refer to ownership, translation & trust, and sustained engagement.

The analytical power of understanding ‘alignment efforts’ between the idea of responsible research and innovation (as a policy instrument for aligning the governance of science and technology to societal needs) and its relation to ‘actions’, that is, the actual changes that have happened throughout the project, the interventions that were designed and conducted, was invaluable to the capturing of the overall impacts of the project. In short, the overall impact assessment should be seen as trying to capture transformational change in the regional energy innovation ecosystems across different aspects. It investigates how to create the conditions for going beyond a “pilot/project” logic of experimentation and triggering a deeper and broader process of change. The objective is to build collective responsibility among key territorial R&I actors and stakeholders, influencing the future direction of innovation policies and strategies in the concerned territory. This is critical for further sustainability which is described in Section 5.

4.2. RIPEET’s main features

In the RIPEET project, a Responsible Research and Innovation approach is taken to align societal values and needs with Research and Innovation practices in the context of sustainable energy. This approach builds upon a co-creation process involving a multitude of local stakeholders, representing all areas of the quintuple helix (governance, industry, academia, civil society and environment), and resulted in ten types of impacts as described in Section 3. Stakeholders’ conversations address what innovations should be pursued that contribute to societal needs and work towards sustainability targets. This democratic process does not only support in identifying local needs, but also in engaging local capabilities of executive and legislative stakeholders and in establishing new collaborations.

Co-creation is a useful method to bring local communities and policy makers closer together to develop a supportive policy environment for bottom-up sustainable energy innovations. In the RIPEET project

policy co-creation was put into practice in territorial transition labs working on sustainable energy pilots, facing different regional challenges in the implementation process. Regional partners used policy co-creation as a tool for a place-based approach to bring community engagement to their region, but also as a feedback method for various stakeholders involved in the energy transition. In this way they were able to tap into local resources and opportunities that exist and are currently underused. Moreover, it served as a voice for small initiatives and kept citizens involved in a process that they otherwise could feel disconnected from. However, it is critical that the co-creation process takes the regional context into account: local norms and customs serve the interest of local stakeholders, while they pursue a transformative vision. In addition, policy makers must give some authority to the co-creation participants and have to accept a process that does not have clearly predefined outcomes.

Whilst co-creation is a strongly supportive process, it does come with some precautions as well:

Ownership and embedding

Who takes the lead and dictates directionality in the co-creation process? How to manage this?

The Transition Lab being an open co-creative environment presents the danger of losing track of a clear collective pathway towards a common goal. It is rarely the case that the multi-stakeholder groups all have the same ideas on how to approach a societal problem, so there needs to be a lead actor in the process that can take decisions when multiple options are being discussed. In the RIPEET transition lab, at first this role was taken by the RIPEET regional partners and when the pilots were assigned, gradually handed over to the pilot operators. This organising and leading role proved to be a resource and time intensive process that is crucial to consider before engaging in the transition lab approach. Furthermore, it proved also important to clearly define who takes what role in facilitating the co-creation from the beginning to prevent miscoordination during the process. On the management of the co-creation sessions itself, the RIPEET actors found that codifying steps taken and summarising the discussions is a good practice to keep the process transparent to everyone. Clearly, ownership coincides strongly with being institutionally embedded, albeit this may change with changing moderator leads. The institutional embedding also encourages sustained activity in transition lab networks.

Translation and negotiation

How to ensure that stakeholders communicate effectively with each other and that everyone can contribute to the co-creation process?

A second challenging aspect of inviting different types of stakeholders is that not everyone understands the terminology in the same way and is used to the procedures. First of all, it proved to be beneficial to accept that this is a reality and that it is key to respect and listen to every stakeholder's contribution from their background and perspective. Secondly, it can be very helpful to organise multiple targeted sessions in which only stakeholders with a relevant background participate. In such a situation, a summary should be provided and shared with the larger stakeholder group, so that everyone stays in the loop and is fully informed on everything. In RIPEET, targeted sessions were only organised after the initial meeting(s) to ensure that everyone is heard and on the same page in an early stage. Additionally, it proved that in this early stage it is particularly important to build recognition and a common understanding with the participants in order for them to trust decision making in the

targeted sessions. Lastly, it proved to be effective to provide concrete information in advance, use simplified language in the communication with stakeholders and refrain from terminology like co-creation or RRI.

Sustained engagement

How to engage a large and diverse set of stakeholders over the co-creation period? Even when the process deviates from their main interest.

Sustaining engagement of actors with different backgrounds over a long period of time requires consistent attention and effort. From the RIPEET experience the regional partners would argue that the best way to establish this is to provide some type of value to the participants for participating in the co-creation. An appealing proposition that was created in RIPEET was for instance the showcase that RIPEET was a new concept in which locals could determine the initiatives that would be examined. The opportunity to actually change something locally was in that way a big selling point. Also it was important to keep everyone involved in the process and continuously show that progress is being made. Additionally, the RIPEET co-creation sessions were a great platform for regional actors to network and therefore discover regional activities that were unknown to them before and form new collaborations. This sentiment of a regional collaborative space that circulated interesting discussions on the local energy transition resonated in all three regions. Interestingly, RIPEET saw high interest from regional actors in the early stage, lower interest in the middle stage when the transition lab focus narrowed down and high interest again when the pilots were being deployed. Subsequently, this suggests that engaging in the collaborative space that RIPEET provided was most appealing to a wide range of regional actors when new ideas were circulating or new initiatives deployed that other actors were curious about or could relate to.

5. Sustainability

In all three regions where the RIPEET pilot-actions took place, the question of their sustainability and, more generally, of the sustainability of all the activities carried out by RIPEET was treaded with considerable attention. A “sustainability workshop” was held in the three regions between the end of November and December 2023. It was the fulcrum of the reflection on this topic, which began, however, well before its holding.

The commitments and path (or paths) to ensure the sustainability of RIPEET are quite different (each region has its own specific path). They are presented and discussed in the following three sections.

5.1. Extremadura

As already stated, the pilot funded by RIPEET in Extremadura involved activities (capacity-building, networking, IT platform...) functional to the development of Energy Communities. It was implemented by EnVerde, which has exactly this purpose. EnVerde (itself) would therefore represent the “continuity” of RIPEET and the sustainability of the pilot.

The focus on sustainability of the RIPEET pilot-action is therefore, first of all, the ability of EnVerde to continue its activities after RIPEET. Broadly speaking, sustainability is related (also) to the real possibility of creating and spreading energy communities in Extremadura as a socially led energy solution for supporting and increasing energy transition towards renewable energy.

For practicality, we formalize these two aspects separately even though they are closely related.

A – There is no doubt that EnVerde is a somewhat fragile entity in terms of human and financial resources. Nonetheless, in recent months, it has strengthened its contacts with public and private actors, both at the local and regional level, and at the national level, among others, with those carrying out similar work in other regions of Spain (in particular in those regions where energy communities are operational) and with the “Red de Comunidades Energéticas S.Coop”.

Moreover, it is the unanimous opinion of all those who participated in the sustainability workshop that EnVerde with the ENLUCES project is now known as the protagonist promoting energy communities in the region. In addition, AGENEX has promoted two EU funded projects that will sustain the development of energy communities in the region: ShareRES (Interreg Europe) and TRANSCOM EUROACE (Interreg POCTEP) and the “Oficinas para la Transformación Comunitaria” (OTC offices)⁴⁴ that have been funded at national level will be a complementary support. Beyond that, EnVerde is working on multiple fronts to find new projects for strengthening itself (among other, EU budget lines favouring the promotion/development of Energy Communities). And finally, EnVerde has already planned to put online a second edition of the three trainings on the platform in 2024, also improving their quality (e.g., adding further information) also benefiting from feedback received in the meantime.

⁴⁴ Ayudas a Oficinas de Transformación Comunitaria para la promoción y dinamización de comunidades energéticas (Programa CE OFICINAS) | Idae.

EnVerde already has the human resources necessary for this work (which should not require any material costs, as the platform is already set-up). Moreover, EnVerde has already planned to go on with the update of the platform and its support to the promoters' network.

B – The Extremadura context is not the friendliest encouraging one. for developing community-based energy transition initiatives, while in other regions of Spain, particularly in the North, energy communities are well developed. First, there are no “real” energy communities in Extremadura; the existing ones are only at the design (or launch) level. So, EnVerde with its platform with training courses and its network of promoters (while in other regions of Spain, particularly in the North, energy communities are well developed) works in almost virgin terrain (so, there is still a partial lack of awareness in this regard, in particular regarding their usefulness). Second, the political change at the regional level after the last regional election mid-2023 seems could be not particularly in favour of a policy that focuses the energy transition on renewable energy (rather than nuclear energy), on the participation and protagonism of citizens; and on the emphasis on the social issues of the energy transition (e.g., energy communities as a tool for fighting energy poverty).

Given these weaknesses, but also these strengths, some policy indications emerged in the “sustainability workshop” to take into account to ensure the durability of the EnLuces pilot.

- (i) Maintain the Extremadura Energy Transition Laboratory as a vehicle for identifying the needs of the different actors and a space for defining the necessary actions to be implemented (it should be possible thanks to the new funded projects mentioned above).
- (ii) Effectively coordinate all actions present in the territory (OTCs, Network of EnLuces promoters, etc.) This should be guaranteed by EnVerde.
- (iii) Strengthen the presence of specialists in the control and technical management of the Energy Communities (possible thanks to the strengthened relations among EnVerde and the “Red de Comunidades Energéticas S.Coop, as well as the actors of this network); and, in parallel, go ahead on strengthening local capacities (possible thanks to the existing platform that anyway, will continue to be accessible beyond the end of RIPEET).
- (iv) Assign a public figure (“energy manager”) who can comprehensively serve citizens/projects in the territory (in this regard it will be necessary to intensify – also with the support of Fundecyt – the dialogue with the new regional authorities, who are likely to accept such a proposal, especially given the policies in this regard in Europe and Spain).
- (v) Regional government should accept to exercise its arbitration function with the distributors in order to facilitate the development of the Energy Communities and avoid unnecessary obstacles (same as above).
- (vi) Reach a greater political leadership to promote Energy Communities which also translates into clearer and more flexible legislation; in this frame study the possibility to grant aid directly to a group of people (not individually) for facilitating the creation of Energy Communities (same as above).

- (vii) Involving multiple actors beyond the current ones distributed in the territory in the development of the Energy Communities (G.A.L., business organizations⁴⁵, FEMPEX, etc.).
- (viii) Leading associations and public and private educational centres to work together in the development of Energy Communities for being able to involve also disadvantaged people and vulnerable groups in general, to fight against energy poverty.
- (ix) Measuring the impact of Energy Communities in order to compare them with other initiatives (among other to focus on what is done with the energy that is generated, in terms of wealth creation).
- (x) Train from an early age to “energy citizenship”.
- (xi) Develop new funding models that do not rely solely on public aid (e.g., a guarantee fund).
- (xii) Granting aid directly for the creation of CCEE, where it is granted to a group of people, not individually.

As far as can be said today, the path to sustainability for RIPEET in Extremadura appears to be well defined and viable. Hypothetically, all the conditions to ensure durability are in place. Two of these conditions, however (e.g., the institutional and financial solidity of the main protagonist, i.e., EnVerde; and the context at the regional level) remain somewhat uncertain, although RIPEET provided strong incentives towards their stabilisation.

5.2. Ostrobothnia

In Ostrobothnia, considering the activities that have been carried out by RIPEET in the region, the issue of sustainability has to be reviewed at three levels:

- A) the follow-up of the two RIPEET funded pilot-actions
- B) how the policy related to the valorisation of the decentralised energy solutions launched by RIPEET can continue, take root and develop
- C) how the Transition Lab should be embedded in the energy-transition process in the region.

A – Contrary to the cases of Extremadura and the Outer Hebrides where the pilot-actions had a regional dimension, here in Ostrobothnia the pilot-actions had a local dimension (as already stated, they concentrated on one or a few villages).

In the case of the Esse/Ähtävä village, there is a need to take the initial ideas from the pilot further. It would be important to showcase via examples what is possible and highlight laws and regulations, which will change. Esse Elektrokraft and PK Biogas could be one example to show what can be put into practice as a part of a regional vision towards energy communities. The energy storage example under development in Esse is another example, here the business model can still be further developed as it is also connected to future energy flexibility. Esse/Ähtävä Village is thinking of applying for projects through Aktion Österbotten and Aktion Österbotten also have been granted a new project with University of Vaasa/Vebic and the local utility company (Just Transition Fund).

⁴⁵ It has been noted that the future of the Energy Communities in Extremadura also depends on the attitude that will be taken by large companies, more specifically the main ones that manage the production and distribution of electricity: whether they will allow energy communities to be a tool through which electricity reaches citizens.

Looking at the other pilot, Älvbyarna village is part of a Nordforsk application by University of Vaasa as well as the already mentioned project with Vaasan Yliopisto/Vebic through Aktion Österbotten.

Broadly speaking, thanks to the implemented pilot-actions, both villages have entered the ‘circle’ of actors that in Ostrobothnia submit proposals to the European Commission and to national/international funds, which are sometimes funded. This circle, before RIPEET included mainly actors from Academia, business and public authorities. Now it also includes citizens organizations working in the rural⁴⁶ areas (“Public funding available for new types of actors than before”). Beyond those already mentioned, specific regional projects were also identified during the Sustainability Workshop held in Vaasa end November 2023 (e.g. projects on promoting demand response solutions in Ostrobothnia).

B – One of the long-term goals outlined in the regional strategy is that the energy system is based on renewable energy as well as decentralised and smart energy solutions. RIPEET pilots-actions are, in fact, two “anticipatory experiences” of this axis of the regional strategy. Broadly speaking, the Regional Council of Ostrobothnia is now working more on participatory processes in the energy sector based (also) in the RIPEET results.

However, it is not easy to put into practice decentralised systems and it would be important to further explore. Many issues were discussed in this regard during the Sustainability workshop, as shown below.

- From a technological point of view, decentralization is possible, but it is difficult to create a financial sustainable company if less than 10 000 people are connected.
- How can a local community identify the real possibilities, how to take the first steps? Who can be the actor in which kind of systems?⁴⁷ Can this be changed? Who could be contacted in this regard? A fixed procedure would help communities to get a start. In this regard, the dissemination of good practices (e.g., the two pilots-actions and their follow-up – see A above) and results is very important, as well as looking into how different sectors can be connected and can collaborate.
- In this regard, the concept of “energy village” was discussed (dealing in this regard with the possibility to produce and use biogas in farming areas, the farmers use a large share of fossil fuels. Biogas production is also supporting the municipality low-carbon targets, at the same time it can also contribute to employment in the local community).
- The energy crisis affected individuals. So, the perspective of energy efficiency is more important (e.g., affecting consumption patterns towards saving energy is very important) and it could now be easier to “start” from the bottom (e.g., maturing ideas connected to energy communities in a local community⁴⁸).

⁴⁶ Looking at the peculiarities of these areas, the concept of “rurban areas” (rural + urban) could be applied.

⁴⁷ An interesting case, which could be analysed is the development of the fiber network in Ostrobothnia, where people were really engaged and which was affecting the region positively. Can the way of getting people engaged back then be used for the energy transition purpose? The interest was typically larger in the periphery, i.e., further away from the main streets.

⁴⁸ The question around energy communities in Finland and if and why these are not possible in Finland was extensively discussed in one of the working groups of the Sustainability Workshop. Are there any prospects of getting this changed? Should another definition of energy communities be applied in Finland? If it isn't a legal person, it can't become a contracting

- In this regard, it is crucial to highlight that “Energy is no longer just business, it is also a social service” (as underlined in the report of a working group during the workshop).
- Legal aspects need to be taken into account more thoroughly in planning of small-scale energy initiatives (how law can facilitate/hinder energy small-scale initiatives).

C – The following networks / collaboration formats were discussed as possible ways of continuing the (Transition Lab) approach started in RIPEET:

- The new innovation network for democracy, which is coordinated via the Regional Council of Ostrobothnia in cooperation with other actors
- Activities with pupils implemented in collaboration with Nuorten Suomi – Vaikuta -teemapäivä (“Youngsters’ Finland – Impact Day”), which have just been tested for the first time in Korsnäs and will be implemented in Vöyri in 2024.
- Yrityskylä (“company village”) as a possible environment for “spreading the word” (this is an established format in Vaasa where pupils can experience how society works and can take on different professions for a day when they visit the “company village”).

In continuity with what has already been done within RIPEET, its partners in Ostrobothnia (who should remain allies even after the conclusion of RIPEET, with the addition of the promoters of the two pilot-actions) intend to continue to engage people through events, such as the official Energy Week (March 2024)⁴⁹. If the arrangement of an “own” event is too time and cost consuming, there would be a possibility to push for a stronger focus on citizen-led energy initiatives as a part of the Sustainability week, which is arranged yearly in autumn in Vaasa/Ostrobothnia. Or alternatively, an “Energy Day” could be arranged, focusing on citizen-led energy initiatives.

During the sustainability workshop, multiple remarks were made on continuing to engage people as a follow-up to what was done in RIPEET.

- Different tools for engagement are needed for different groups (for example young people) in the perspective of bringing actors together across different sectors, areas and fields.
- Moreover, it is important to “popularise” the message when working with civil society, especially if the target group is children or elderly people.
- Inviting the “wrong” people to sessions in order to get away from the usual suspects and to get totally new perspectives and ideas; mixing different sectors, different topics in order to boost new ideas.
- Villages in Ostrobothnia arrange their own events in the local communities, but it can be difficult to find information about this from an outside perspective.
- It is crucial to spread knowledge between actors involved in locally driven and owned energy projects.
- Civil society actors can for sure be directly involved or even lead initiatives, but only when there are opportunities to concretely implement. The work with preparing the ground must be led by other actors such as universities or regional authorities etc.

party and so, which kind of legal organizations should be created that could become the contracting party? Cooperatives? Moreover, it has been noted that the role of the prosumer is underdeveloped in Finland, affecting the idea of energy communities. For dealing with these issues, it appears necessary to compare with other countries to learn (more specifically, Nordic countries).

⁴⁹ Energy Week 11-14 March 2024 Exhibition Seminars.

As far as it is possible to say today, the path to sustainability of RIPEET in Ostrobothnia appears well determined and viable. It is based essentially on three pillars. (i) A strong alliance among the RIPEET partners + the solution providers “representing” a quadruple helix cluster which would continue to be operational even after the conclusion of RIPEET (who are already started to plan events and activities for 2024); (ii) multiple projects/financing possibilities already identified (and some already operational) to continue the work undertaken with RIPEET; and (iii) the Regional strategy giving long-term directionality to topics of renewable energy as well as decentralized and smart energy solutions.

5.3. Outer Hebrides

The pilot-action funded in Outer Hebrides reached some very interesting results at the review stage (as described in the §3.3.). However, a solution to concretely reduce fuel poverty and eliminate or almost eliminate extreme fuel poverty is less well provided. Indeed, this was not the intended objective from the beginning, given that providing the solution, in this pilot-action, consisted of “only” in: “exploring options for locally generated energy to be supplied and/or marketed locally and reduce household energy costs”.

But during the presentation of the results of the pilot-action (Sustainability workshop, Stornoway, December 5th), further actions to be carried out have been listed. So, it represents a work to be continued (one of the core slides in the presentation was entitled “future work – key learning and next steps”). How to continue the work in what context (e.g., funded projects) and with what resources was therefore the subject of the sustainability workshop of which the main results are reported below. Moreover, since the beginning of the second year of activity, the local RIPEET core team had paid close attention to this issue.

First of all, in terms of sustainability of RIPEET, the situation appeared very favourable, thanks to the active presence of 3 other projects with whom the core team has established very fruitful relationships.

- The “ICNZ project” the Islands Growth Deal, a Regional Growth Deal funded by the UK and Scottish Government) was launched in summer 2023. The ICNZ will be delivered in the Outer Hebrides in collaboration between Comhairle nan Eilean Siar (CnES), Community Energy Scotland and the University of the Highlands and Islands, all organisation who had been involved in RIPEET through delivery of the project, participation in the Transition Lab and delivery of the pilot project. ICNZ, among others, will be catalysing what local organisations’ projects are delivering and is including an overview on the on-going projects and here there is already a first concrete link also for informing ICNZ with the RIPEET methodology and results. More specifically, ICNZ, which since its conception, has included the Transition Lab approach, has paid and is paying a lot of attention to what RIPEET has done. Last but not least, CES (one of the two Scotland partners of RIPEET) is deeply involved in the ICNZ implementation and Matthew Logan (who worked in RIPEET since its beginning) is the ICNZ Outer Hebrides Manager. So, in the sustainability workshop, ICNZ was suggested as the most well-placed initiative to facilitate the Transition Lab continuing and, more generally, ICNZ, in Outer

Hebrides, can be considered an extension and continuation of RIPEET. ICNZ could lead part of the additional research required at the end of the pilot-action.

- “Fast followers⁵⁰” (part of Innovate UK’s Net Zero Living Programme) which, according to various stakeholders present at the sustainability workshop, could take charge of the subsequent steps (see §3.3.) inherent to the follow-up of the pilot action. Fast Followers is an Innovate UK funded project which has allowed Comhairle nan Eilean Siar to recruit a Net Zero Innovation and Development Officer to support their strategy and project work around Net Zero. The officer recruited, Carolyn MacPhee, has been key to the delivery of the RIPEET Pilot and can provide further continuity between RIPEET and future energy transition projects in the Western Isles
- “Carbon Neutral islands⁵¹”, which already used the Toolkit developed in the frame of RIPEET when developing engagement resources.

Further projects/initiatives have been quoted during the sustainability workshop that could collaborate in pursuing the objectives of the pilot-action: Green Hysland⁵², Ofgem- Innovation fund⁵³, and Energy Action Scotland⁵⁴. Further entities and networks capable of carrying forward what started with the pilot action have also been identified, as well as further funding opportunities (e.g., the National Lottery).

Beyond ongoing projects and other possible funding sources, during the sustainability workshop, it has been highlighted that the Transition Lab process (coming from RIPEET) should be used on a regular (annual) basis to work through specific decarbonisation challenges leading to co-created pilot projects. So, the Transition Lab will continue in some form (e.g., in the ICNZ frame), but it should be well understood how it continues and interacts/aligns with other groups (avoiding any duplication with existing networking groups).

The Transition Lab developed under RIPEET could be a reference for energy-specific topics and coordination among relevant stakeholders in this regard, for instance, during the presentation of the pilot’s results, it was stated by the participants in the sustainability workshop: *“It can also function as a forum to get feedback and ideas/sounding board on energy solutions”*; *“the Transition Lab process should be used on a regular (annual) basis to work through specific decarbonisation challenges leading to co-created pilot projects”*. It should continue as a forum for sharing updates; and for discussing new research ideas and seeking appropriate research funding. In the frame of the ICNZ, the co-creation approach could be used to develop pilot projects as priority areas arise and are identified by local stakeholders. This would allow a responsive approach to local energy transition challenges.

Participants in the sustainability workshop suggested that upcoming community benefit funds could potentially be used to fund future Transition Labs. Generally, there was a feeling that a continuation of the Transition Lab should involve more stakeholders from the private and industrial sectors. Multiple attempts were made to include such stakeholders during the RIPEET project but for various reasons they did not engage. In this regard, participants discussed the upcoming energy developments around

⁵⁰ Fast Followers accelerate towards Net Zero - Innovate UK KTN (ktn-uk.org).

⁵¹ Carbon neutral islands - Renewable and low carbon energy - gov.scot (www.gov.scot).

⁵² Green Hysland - Deployment of a H2 Ecosystem on the Island of Mallorca.

⁵³ Ofgem- Innovation fund - Cerca (bing.com).

⁵⁴ Energy Action Scotland - EAS.

the Outer Hebrides and suggested that this may create a new opportunity and context to engage with industrial stakeholders. Their involvement in co-creation activities is considered vital in the local energy transition's wider perspective (useful for defining needs and developing new projects).

The set-up of a online information portal on local issues that could integrate appropriate decision-making tools was suggested as a useful, as well as an online platform for sharing data. This Portal could also serve to disseminate information through the community; also helping them to know where to start, independent and impartial. As potential pathways for implementing this the ICNZ project was mentioned, which is led by local trusted organisations; *"so that households take on board what is being said"*.

As far as it is possible to say today, the path to sustainability of RIPEET in Outer Hebrides appears well determined and viable and is based essentially on two pillars. On one hand, the fast-followers project providing funds and context for the follow-up of the pilot-action; on the other hand, ICNZ should be able to take the reins of the Transition Lab set-up from RIPEET and ensure the continuity of this approach, as well as the expansion of activities. Added to these pillars are the other opportunities mentioned in this section, representing further assets to ensure the RIPEET durability.

6. Beyond RIPEET

6.1. Transferability to Mirror regions and beyond

Based on the experience gained in Extremadura, Ostrobothnia, and Outer Hebrides (and also by the project as a whole) the RIPEET project supported peer-learning activities in the field of Responsible Research and Innovation policy experimentations for energy transition in 6 Mirror regions all over Europe, which are introduced below.

- Andalusia (Spain), more specifically Málaga TechPark, and members from the local and regional innovation ecosystem, together with companies, involved in a profound change of mentality and a redefinition of its strategy in terms of sustainability and circularity applied to energy, transport, building and resources, with the aim to become an urban reference in these areas.
- Lithuania, represented by “Innovation Agency Lithuania” where a wind farm with a capacity of up to 700 MW is planned to be constructed by 2030 in a Baltic Sea territory, expected to produce nearly a quarter of Lithuania’s current electricity demand.
- Aran islands (Ireland), represented by “Aran Islands Energy Co-Op” where the residents of the 3 islands, through their own energy cooperative are working towards becoming self-sufficient in locally generated renewable energy and free from dependency on oil, coal and gas “as soon as possible”⁵⁵
- La Réunion (France; “Département d’Outre-Mer” in Africa), represented by “La Réunion Region” and by “Horizon Réunion” where regional authorities have encouraged energy transition, for the last 15 years, leading to the significant growth of renewable energies, especially solar technologies.
- Egersund (Norway), represented by the “Eigersund municipality...” where almost all electricity is generated by hydro plants from the mainland with minor shares of wind and solar power; and where the existing energy system requires an upgrade, in line with high-level ambition on green alternatives for sustainable development.
- Silesia (Poland), represented by “Marshal’s Office of the Silesian Voivodeship” the largest mining region in the European Union, which has been undergoing a process of transformation for almost 30 years, having the ambitious goal is to achieve climate neutrality by 2050.

In this report, we will limit ourselves to tracing potentials of “Impact replicability/ transferability”, i.e., the ability of the territorial RIPEET activities to be replicated beyond the immediate local context of the pilot territories,⁵⁶ In other words, whether and how RIPEET’s activities, facilitated through the Peer Learning Programme and the mutual learning activities, are leading to changes (having effects) in the mirror regions (and beyond) as well.

⁵⁵ <https://www.aranislandsenergycoop.ie/>

⁵⁶ For more on the process of Mirror Territory selection, the cooperation activities and the cooperation perspectives see Deliverable 7.4 and the RIPEET webpage: <https://ripeet.eu/other/our-mirror-regions>.

Extremadura, Andalucia, and Lithuania

In Section 3.2. we have highlighted that the set-up of a much more favourable environment for the growing of effective Energy Communities in Extremadura has been the main effect of the RIPEET pilot-action. However, EnVerde, despite being an entity born, rooted and operational in Extremadura, can also work (and is starting to take an interest) in other regions of Spain; and is consolidating its relationships with various other actors dealing with Energy Communities. So, the pilot-action, indeed is starting to have effects also elsewhere in Spain, contributing to producing changes in the development of energy communities. And more specifically, according to a few among the consulted stakeholders, the network of Extremadura's promoters of EnLuce, would even work cross border, to other regions (e.g., in relation with the "Oficinas para la Transformación Comunitaria"/OTC, which are present around the whole country).

As regards Andalucia, Málaga TechPark is very interested in the whole RIPEET approach towards an improvement of the governance of R&I (and, broadly, the management) of the energy sector. More specifically they are very much interested in how significantly RIPEET contributed to intensifying cooperation between actors, leading them to talk or talk more with each other. Indeed, in the Málaga TechPark, they would need to improve *"methodologies to involve the actors of our ecosystem and in particular companies, since it is very difficult to involve them"*. However, Andalucia does not seem particularly interested in Energy Communities and in all the work carried out and underway by EnVerde to promote them. It therefore seems unlikely that EnVerde will produce any effects in Andalucia via the Málaga TechPark.

Thanks to the experience gained from RIPEET, they have improved their engagement methodologies for their stakeholders, although there is still a lot to improve. (, RIPEET can be credited with this change, providing concrete guidelines on how to set up such an engaging process. Nevertheless, it should be noted that they are essentially talking about businesses, whereas the expansion of governance produced by RIPEET in Extremadura has led above all to a greater inclusion of civil society and citizens. However, among the businesses in the Málaga TechPark, there are many micro-enterprises and therefore mostly actors, who until now did not have a voice or who did not have communication channels to address energy transition issues. Exactly one of the biggest challenges addressed by RIPEET in Extremadura. In Extremadura, with reference, above all, to citizens and social entities. There in Malaga with reference to micro-enterprises.

Looking now at the second Mirror, that is not a region, but a country, Lithuania, there some different trends are noticeable. In Lithuania, the Pilot-Action on energy communities is considered with interest, albeit there are not yet energy communities in that country. There are essentially private prosumers, such as individuals/single families, while it only starts at the community level. So, the Extremadura experience should be useful in strengthening this process (e.g., *"the Extremadura experience is useful for believing that it is possible"*).

Beyond the pilot, the whole RIPEET experience in Extremadura should inform the implementation of projects on energy efficiency in Lithuania. However, a 'transfer' of information from the technical to the political level is still in progress" (according to the representative, which is indispensable in order to actually have an effect on the current energy transition process.

Ostrobothnia, Egersund, and Silesia

In the previous pages, we have already highlighted the changes that RIPEET is producing in Ostrobothnia. In terms of transferability, it must be added that a process of transferring the solutions tested in the villages already involved in the two pilot actions towards further villages in the region has already been planned. For the moment Aktion Österbotten have been granted a new project with University of Vaasa/Vebic and the local utility company in Ähtävä/Esse (from the EC Just Transition Fund) to bring the tested model further and to more villages in Ostrobothnia⁵⁷.

Looking now at the Egersund Mirror region, the Online calculation tool for sustainable energy systems for buildings created by the Novia University of Applied Sciences in the frame of the first pilot, was considered very interesting and should be used in this municipality too, while, from the second pilot, the municipality of Egersund intend to adopt the Smart Village approach. These are two transfers which, for the moment, are still “cognitive”, but which should soon have operational effects in this Mirror territory. Egersund also seems to draw inspiration from the – much appreciated – governance model of Ostrobothnia in relation to R&I (and in a broader sense the management) of the energy sector. They assumed it as a very useful example to learn how in Ostrobothnia the connection is made among public administration, business and academia. However, in saying this, they seem to be more interested in the “Triple Helix” model consolidated for decades in Ostrobothnia; rather than the “Quadruple helix” promoted by RIPEET with the inclusion of civil society and citizenship or, more specifically, with the emergence of the Village perspective.

The Smart Village approach is considered very useful in Silesia too, and broadly speaking, for the whole rural context in Polonia. The Silesian Voivodeship is thinking about adopting it and, in this perspective, they are promoting a workshop with the local stakeholders in Silesia with the participation of Ostrobothnia RIPEET partners and solution providers’ for implementing local energy solutions in Silesia too⁵⁸. According to the representatives from the Voivodeship, RIPEET experience should be very useful in Silesia also beyond the energy sector (*“we are more interested in the process ... to understand how change can be produced”; “how the participatory process is working, how to motivate the participation” – “very important for us, because we have not so much experience at this regard; and local politicians less than us; we want to encourage local politicians to work more with the local communities”*). They intend to incorporate what has been done by RIPEET in Ostrobothnia (the whole approach) in their actions at the regional level. They already started to prepare their specific call for proposals, starting a project like RIPEET.

⁵⁷ In this regard, it may be interesting what was stated by a stakeholder who collaborates both with the University of Vaasa and with the Regional Council of Ostrobothnia, according to whom, what was experimented in the two pilot actions is very relevant in the village’s context in Finland: however not elsewhere in Europe.

⁵⁸ The main considered take-away is to have seen that many solutions have been possible thanks to the local actors, for being able to push in this direction also in Poland, looking at the local needs and at the local solutions.

Outer Hebrides, Aran Islands, and La Reunion

The Outer Hebrides, as an island group, present unique challenges in the energy transition. The island group faces difficulties with energy grid connectivity and energy poverty due to its scattered nature. However, it boasts abundant natural resources and a robust community base, including numerous community owned energy projects. RIPEET has successfully initiated a strong stakeholder community and constructive dialogues among them. As a result, the Outer Hebrides have much to showcase and the potential to exchange experiences with other (island) regions is huge, as they are facing similar issues but lacking experience with energy communities and stakeholder engagement.

The Aran Islands of Ireland, a small and sparsely populated islands group, have been designated as a carbon-neutral zone by the national government. Collaborating with the regional council, plans are underway for sustainable development. However, for any type of energy innovation the islands are very dependent on the mainland in the form of finance, skilled labour and political approval. The presence of a framework like RIPEET facilitated the approval of such actors like the regional council. A successful co-creation session, utilizing RIPEET methodology, focused on local energy production and sustainable mobility. Similar sessions are planned for the future, with an expansion of stakeholder involvement. The Aran Islands are also selected as one of the EU 30 Renewable Islands for 2030, to which these initiatives can connect.

Moving to La Reunion, an overseas territory of France in the Indian Ocean, it has distinct characteristics with its subtropical climate and a population of almost one million. Despite these differences, La Reunion shares common issues with the Outer Hebrides, such as energy grid connectivity, local energy production, and energy poverty. Collaboration in the region and with other regions is challenging due to the involvement of numerous actors in the La Reunion case, demanding substantial effort to organize initiatives. Energy holds a highly political nature in La Reunion, where large companies dominate the sector, influencing both energy policies and politics. Currently, academia and citizens have limited roles in the energy debate, making a mapping exercise, similar to RIPEET's, highly valuable.

Efforts are underway to establish committees in energy governance for co-creation and inclusive energy innovation. While these efforts have been present already before RIPEET, the experiences made through the RIPEET peer learning programme, where representatives from La Réunion got first hand insights on how to set up such a process, can be considered crucial for designing the process. Furthermore, La Reunion is set to participate in the Outermost Regions group, comprised of EU overseas territories collaborating on energy initiatives from 2024 onwards.

... and beyond

In the three previous sections, we have tried to show the present and expected effects of RIPEET beyond the pilot territories, focusing on the experiences of the selected Mirror regions. RIPEET, however, should also produce effects beyond these territories. In this perspective, on 17th January 2024, a few days before its conclusions, RIPEET promoted the organization of a Policy Lab in Brussels devoted to identifying different EU policy instruments and funding schemes to which the RIPEET methodology can be useful, and therefore replicated. Participants in this Lab were not only the

representatives of the RIPEET partners and the RIPEET Mirror regions, but also representatives of many other European regions and territories who thus became aware, not only of the approaches and methods used in RIPEET and related activities, but also of how the RIPEET experience transferred to the Mirror regions. This had the intention of promoting a similar transferability also in these further regions and territories.

The other European regions and territories that participated in this Lab and/or Final Conference are listed in the table below.

Region/Territory	Country
Brussels Municipality	Belgium
Odisee (university)	Belgium
Central Denmark	Denmark
Tampere University of Applied Science	Finland
Helsinki	Finland
West Finland EU Office	Finland
Turku	Finland
Auvergne Rhône Alpes	France
Grand Est-Europe	France
Autonomous Province of Bolzano – South Tyrol	Italy
Autonomous Province of Trento	Italy
Lower Silesia Regional Office	Poland
Murcia	Spain
Basque Country	Spain
Gothenburg European Office	Sweden
Shetland Islands Council	UK
Sussex	UK

The Lab session was successful, marked by extensive debate and active participation. Although, assessing the transferability of RIPEET practices or approaches to additional territories cannot be determined at this moment. It is worth noting that representatives from 17 territories spanning nine European countries were in attendance, providing a significant presence despite the uncertainty surrounding broader applicability.

6.2. Spreading the RIPEET methodology

Examining the impact of the RIPEET approach in different regions sheds light on the diverse outcomes and challenges faced. In regions such as Extremadura, Andalucia, and Lithuania, the RIPEET pilot-action has initiated positive changes. In Andalucia, mostly methodological insights on how to engage stakeholders. In Lithuania, where energy communities are nascent, the Extremadura experience with initiating energy communities was seen as valuable. Shifting to Ostrobothnia, Egersund, and Silesia, we observe planned transfers of successful solutions from RIPEET pilots to further regions. The Smart Village approach gains traction in Egersund and Silesia, showcasing potential for broader rural implementation. Lastly, in the Outer Hebrides, Aran Islands, and La Reunion, unique challenges and successes emerge, emphasizing the need for adaptable methodologies to address varied contexts and stakeholder landscapes.

Reflecting on these experiences, it becomes apparent that certain elements are more readily transferable than others. One aspect that appears relatively transferable is the implementation of co-creation sessions and associated tools, as well as a conscious mapping of context and stakeholders. These components have shown success in fostering collaboration and engagement in the form of more diverse stakeholder involvement and the implementation of co-creation in local energy discussions across the regions. In some places going as far as contributing to the development of energy communities and smart village concepts. On the other hand, elements like pilot experimentation may be less transferable, as they often require specific funding (however, it is possible if funds become available as could happen soon in Silesia). Additionally, the sustained presence of an engaged regional team throughout the process might face challenges in terms of continuity.

7. Concluding remarks

In the preceding sections we have, on the basis of the approach presented in Section 1., tried to assess the impact and sustainability of RIPEET in Extremadura, Ostrobothnia and Outer Hebrides, also considering the topicality and potential of its transferability in the Mirror regions and beyond.

To conclude, in this section, we will attempt to make an overall assessment by systematically applying four impact frames, as we planned to do three years ago at the end of the Task 6.1 “Monitoring, evaluation and impact assessment tools and plan”. Frames that implicitly underlay all the work presented in Section 3 of this deliverable. These frames are:

- 1) Sustainable Development Goals
- 2) MoRRI/SuperMoRRI
- 3) Transdisciplinary advancement
- 4) Structural change.

To these four frames must be added what has already been outlined in Sections 5 and 6 regarding the sustainability and transferability of the impact

7.1. Sustainable development goals

As originally planned, the following 5 SDGs were to be considered in RIPEET:

- “Ensure access to affordable, reliable, sustainable and modern energy for all” (SD7)
- “Make cities and human settlements inclusive, safe, resilient and sustainable” (SDG11)
- “Ensure sustainable consumption and production pattern” (SDG12)
- “Take urgent action to combat climate change and its impacts” (SDG13)
- Strengthen a “global partnership for sustainable development” (SDG17).

RIPEET certainly contributed to the advancement in the three regions around SDG7 “Ensure access to affordable, reliable, sustainable and modern energy for all”. The following examples can be highlighted:

- The set-up of a much more favourable environment for the growing of effective Energy Communities in Extremadura (network of energy communities promoters; increased awareness of public officials and citizens on energy communities as a functional tool for the energy transition)
- The set-up of tools for calculating economic benefits of using renewable energy resources in the pilot-actions in Ostrobothnia (in particular the development and test of a calculation tool to help the villages make well-informed fact-based decisions about their energy solutions in Älvbyarna)
- The development of energy strategies for the villages that tap into the whole potential of skills and ideas available in Esse/Ähtävä
- The identification of shared solutions to be undertaken in order to change at the local level to enable the energy transition in the Outer Hebrides, facilitating better direction of the policies carried out by local authorities in this regard.

Although progress was generated in the three RIPEET regions with regard to SDG11 “Make cities and human settlements inclusive, safe, resilient and sustainable”, it was in a more indirect way. For instance, looking at the social function of energy communities in Extremadura as a tool for fighting energy poverty, which, in turn, increases communities’ resilience. Additionally, examining the recognition and representation of the significant skills and competences of people in the villages of Ostrobothnia, coupled with the local people learning that they can create local solutions together for energy needs. This process leads to an increased resilience of the involved communities, empowering villages’ people.

SDG12 “Ensure sustainable consumption and production pattern”, conversely, has scarcely been considered. However, it can be noted that tools for calculating economic benefits of using renewable energy resources provided in both pilot-actions in Ostrobothnia should lead to ensure a more energy sustainable consumption (this could also lead to more generalised effects on consumption patterns).

Also in relation to what we have already said for SDG7, it can definitely be said that RIPEET addressed SDG13. Everything that leads, on the one hand, to an improvement in energy efficiency and, on the other hand, to a greater use of renewable energies, should be considered “Urgent action to combat climate change and its impacts”.

Last but not least, one cannot fail to emphasise how much, both the whole Transition Lab path in the three regions and the co-creation process conducted at local and regional levels in Extremadura, Ostrobothnia, and in the Outer Hebrides, represent “progress in multi-stakeholder development effectiveness monitoring frameworks that support the achievement of the sustainable development goal”, as stated by the SDG17. Indeed, RIPEET seems to have significantly contributed, in all the three regions, to intensifying cooperation between actors (even if, often, many people already knew each other before), leading many actors to talk or talk more with each other. Also, as it happened in the Outer Hebrides, some actors who were previously in conflict with each other are now collaborating.

Furthermore, laying the foundations for the establishment of energy communities (Extremadura) with the involvement of citizens and public officials (“a niche of engaged people group that can do something bottom-up together”, as we said in §3.1.) goes in this same direction, as well as piloting a new organisational model for developing strategies for smart energy villages that taps into the knowledge potential and local resources available (Ostrobothnia).

7.2. MoRRI/SuperMoRRI

The ways in which the contents of the Super MoRRI project (and the previous MoRRI approach) have contributed to and been considered in RIPEET have already been dealt with in the previous sections and, in particular, in Section 1.4. Here we will limit ourselves to considering the six key-issues in which the MoRRI indicators are classified (Gender equality, Public engagement, Learning/Science education, Ethics, open access, and Governance) trying to see how, thanks to RIPEET, progress has occurred in Extremadura, Ostrobothnia and the Outer Hebrides.

We did not extensively cover Gender Equality in the previous pages. This does not mean that this RRI key-issue has been ignored by RIPEET. It is important to recall that across all RIPEET events in Extremadura, Ostrobothnia, and the Outer Hebrides, including those associated with the path undertaken by the transition labs and those involving co-creation or training within the pilot actions, a concerted effort was made to maintain gender balance. In every instance, careful attention was dedicated to addressing gender-related considerations. Many of these events had a balanced presence but others much less (for example some co-creation events in the villages in Ostrobothnia or the training of officials of the local authorities in Extremadura). It is not certain that RIPEET has produced changes in this regard even if it certainly kept a spotlight on this issue for at least two years in the three regions.

Public engagement is the essence of the Transition Labs (a greater outreach to citizens and social entities) and the co-creation where citizens (from rural areas too), civil society organisations and/or environmental groups, as well as all the other relevant stakeholders, such as SMEs and other enterprises, academia and research centres, and public officials were convened and have actually been attending. This would be enough to allow us to state that RIPEET, simply through its implementation, was already an assertion of this issue. However, there are far more remarkable effects in the three regions that deserve to be mentioned.

- Having involved people who until now did not have a voice or who did not have communication channels to address energy transition issues, as it happened through the pilot-actions both in Extremadura and in Ostrobothnia (despite being endowed with relevant skills and competences).
- Having put together a lot of people that do not meet otherwise for sharing ideas on how to reach common goals as it happened in all the pilot-actions.
- In the Outer Hebrides, RIPEET has been a catalyst, notably by bringing actors together, entailing a (partial) shift from predominantly bilateral forms of communication to predominantly multilateral forms of communication; as well as an increase in partnerships between the various actors.
- The Regional Council of Ostrobothnia is starting a regional innovation network for participatory democracy in Ostrobothnia focusing on energy and other topics from a participatory and democratic viewpoint.

Transition Labs and co-creation could also be considered as science education experiments (in a broad sense). Moreover, RIPEET entailed further learning actions such as the research café sessions at the University of Vaasa in Ostrobothnia; the “focus sessions” on various topics (e.g., energy transition and maritime) in Outer Hebrides or the training courses addressed to energy community promoters, local authorities officials and citizens in Extremadura. Not to mention the three intense peer-learning programs among the RIPEET partners in Extremadura, Ostrobothnia and Outer Hebrides and the corresponding stakeholders in the six Mirror regions. Here too, it cannot be said that RIPEET has produced changes in this regard even if a lot has certainly been done on this issue during the whole project in the three regions.

Ethics and open access have been issues not addressed directly by RIPEET in the three regions. However, it could be argued that the pilot-actions in Ostrobothnia, especially that of Älvbyarna (in

particular the development and test at the village level of a calculation tool to help people make well-informed fact-based decisions about their energy solutions) included, to some extent, unique experiments of open access.

For sure, RIPEET, as already well documented, has generated an important change in Ostrobothnia in the governance of Research and Innovation in energy through the shift from a three helix to a four-helix approach with the inclusion (or at least an improved inclusion) of the citizens' perspective in the regional energy innovation discussions, including the one of people living in rural areas (and their village associations and networking). Now, as stated in §3.2., "normal people" are becoming 'owners' of the energy transition and thereby also protagonists of R&I. Moreover, this shift already entails changes in regional policy that are becoming more inclusive with probable additional positive effects in terms of access to affordable and sustainable energy for all.

To a lesser extent something similar is also happening in Extremadura through the potential impetuosity of energy communities (albeit, as stated in §3.1., this policy is still in a nascent state). However, this is a process still in progress for which RIPEET has only sown the seeds, with possible consequences on energy R&I governance in this region too.

Finally, in the Outer Hebrides, RIPEET generated a new configuration of relations between energy actors in the region (in other words, a repositioning of the actors) through an improvement of relations between the actors already involved, and the active implication of multiple previously uninvolved actors. Consequently, the energy sector governance is more shared.

Last but not least, raising awareness about the concepts behind RRI (although not necessarily in these words) has affected to a higher extent the organizations of the regional core team, and maybe to a smaller extent, other organizations participating in the regional transition lab, entailing effects to reinforce the importance of issues such as gender, public engagement, and responsible innovation (mainly in Extremadura and in Outer Hebrides; less in Ostrobothnia where the starting stage was already far ahead).

7.3. Transdisciplinary advancement

Also in this regard, there are important changes, generated by RIPEET, that can be noted. As already mentioned in Section 3., the whole Energy Transition Lab process had a certain impact in terms of transdisciplinary scientific progress, as it was based on novel partnerships between different actors and from different sectors. Indeed, the process involved representatives from academia with different disciplines (e.g., interdisciplinarity), civil society, public authorities and even business, each with their own specific knowledge. In all three regions, RIPEET's impact has been that regions moved from dialogues among stakeholders in particular with civil society, via translation and common understanding. This happened very significantly in Ostrobothnia and to a notable extent also in the Outer Hebrides and, instead, much less in Extremadura due, above all, to the very low participation of academia.

More specifically, as already stated in Section 3.2., in Ostrobothnia these transdisciplinary partnerships led to an increased interest in science in the local communities; and an increased interest in villages as objects for regional research and development projects as well as to a better understanding of the societal challenges in energy/climate change issues for all. Moreover, the pilot-actions implementation entailed also trans-epistemic practices through the valorisation of local knowledge belonging to village people involved in co-creation.

In the Outer Hebrides, the progress in transdisciplinary scientific endeavours primarily stemmed from the establishment of innovative partnerships and connections among various stakeholders representing diverse disciplines, including academia, civil society, and local authorities. This dynamic collaboration facilitated significant knowledge exchange among experts and individuals within the energy sector.

7.4. Structural Change

Structural changes have not seen big progression during the project., as is to be expected in the phase of project implementation. Nevertheless, in Ostrobothnia, the vigorous intrusion on the energy transition scene of new players that were previously almost completely ignored is generating and could generate even more changes that can be considered structural, as they will acknowledge the new scenario in which they find themselves. In fact, the Regional Council of Ostrobothnia is now implementing a challenge-driven approach in orchestrating stakeholders and building up collaborative efforts, starting a regional innovation network for participatory democracy in Ostrobothnia focusing on energy and other topics from a participatory and democratic viewpoint. It is a good sign that policy is taking up the responsibility. In the Outer Hebrides a process of structural change, more inspired by the embedment of RRI principles is started among the RIPEET partners and could be more consolidated in CES, since CES is now delivering ICNZ in the Outer Hebrides, which is following most of the issues of the RIPEET approach.

7.5. Sustainability

As already highlighted in Section 5., a path towards sustainability has already been undertaken in each of the three regions. It is useful to remember them in the context of these conclusions.

- In Extremadura, sustainability is, first of all, related to the ability of EnVerde (the solution's provider) to continue its activities after RIPEET, since its core business corresponds to the pilot-action undertaken in RIPEET. Broadly speaking, sustainability is related (also) to the real possibility of creating and spreading energy communities in Extremadura as a socially led energy solution for supporting and increasing energy transition towards renewable energy. The path to sustainability of RIPEET appears well determined and viable. Hypothetically, all the conditions to ensure durability are in place. Two of these conditions, however (e.g., the institutional and financial solidity of the main protagonist, i.e., EnVerde; and the political context at the regional level) remain somewhat uncertain.

- In Ostrobothnia, the path to sustainability of RIPEET appears well determined and viable as well. It is based on three pillars:
 - A strong alliance among the RIPEET partners + the solution providers “representing” a quadruple helix cluster which would continue to be operational even after the conclusion of RIPEET (who are already started to plan events and activities for 2024)).
 - Multiple projects/financing possibilities already identified (and some already operational) to continue the work undertaken with RIPEET.
 - The Regional strategy giving long-term directionality to topics of renewable energy as well as decentralized and smart energy solutions and being informed by the RIPEET results.
- Finally, also the path to sustainability of RIPEET in Outer Hebrides appears well determined and viable. It is based on two pillars. On one hand, the fast-followers project as funds and context for the follow-up of the pilot-action; on the other hand, ICNZ should be able to take the reins of the Transition Lab set-up from RIPEET and ensure the continuity of this approach, as well as the expansion of activities.

7.6. Transferability

Given everything that has been said in Section 6. about the transferability of the RIPEET experience, the following conclusions can be drawn.

- The pilot actions implemented in Ostrobothnia and Extremadura could be reproduced with high probability in the same national contexts (Finland and Spain); they are also considered with great interest, respectively, in Poland (Silesia region) and in Lithuania.
- From the pilot-actions some of their components are sometimes dissected (taking just some elements). More specifically, Egersund is interested in the Online calculation tool for sustainable energy systems for buildings created by the Novia University of Applied Sciences in the frame of one among the pilot in Ostrobothnia, while, from the second pilot, the municipality of Egersund intend to adopt the Smart Village approach.
- As regards the RIPEET approach, with particular regard to the Transition Lab path, the methods relating to stakeholder mapping and engagement and co-creation were of great interest for all 6 Mirror regions.
 - In Silesia, they would like to reproduce the entire process by also financing specific pilot actions.
 - In Lithuania, the whole RIPEET experience in Extremadura should inform the implementation of projects on energy efficiency.
 - In the Aran Islands a successful co-creation session utilizing RIPEET methodology, focused on local energy production and sustainable mobility has been already implemented and similar sessions are planned for the future, with an expansion of stakeholder involvement.
 - In La Reunion, since Academia and citizens have limited roles in the energy debate, making a mapping exercise, similar to the one done in RIPEET’s is considered highly valuable.

- Finally, both the Málaga TechPark and Egersund are very interested in the whole RIPEET approach towards an improvement of the governance of R&I. More specifically they are very much interested in how significantly RIPEET contributed to intensifying cooperation between actors. However, the Málaga TechPark is looking mainly at the involvement of business, including SMEs; while Egersund is more rooted on a three-helix approach. Both seem much less interested in civil society and citizens' engagement.
- RIPEET also aimed to build a Community of Practice (CoP) between the six Mirror regions and the three RIPEET regions. Through this RIPEET CoP, the Mirror regions also became aware of energy transition practices of great interest to them in which other actors (than RIPEET actors) are protagonists.
- Beyond the six Mirror regions 17 further “territories” belonging to 9 European countries were informed and discussed in a lively spirit on RIPEET approaches and experiences at the end of the Project.

7.7. A concluding “game”

We conclude this evaluation by presenting an empirical assessment table, intended as a “game”-like reflection exercise on the impact assessment and its conclusions. The empirical assessment table hereby works as a coherent frame for assigning numerical values to the different impact categories tackled in the three regions through RIPEET. The values (between 0-3) were assigned according to a qualitative assessment of the conducted interviews and impact assessment meeting by the research team compiled of K&I and UL. It serves as an intent to capture an overview on impact trajectories that unfolded in the different regions, allowing a first overview on which impacts dimensions were addressed more in each region, based on a heuristic assessment.

While we are aware that this is not based on a grading scheme replicable outside of the project context, it still offers a tentative approximation towards impact trajectories based on intersubjective agreement between the researchers involved. The categories presented and addressed below are connected to the various dimensions mentioned above and applied to each of the three RIPEET regions (Extremadura, Ostrobothnia and Outer Hebrides). However, it has to be kept in mind that this is intended only as a “game”-like reflection exercise that presents readers with a quick overview on the main impact dimensions that were addressed throughout the projects and how they were present in the different participating regions.

The impact “game” attributed different values to each impact dimension in each region. Hereby, we assume the following values:

0 = no impact

1 = little / potential impact

2 = moderate impact

3 = consolidated/substantial impact

n.a. = not applicable

	Extremadura	Ostrobothnia	Outer Hebrides
Ensure access to affordable, reliable, sustainable and modern energy for all	2	2	1
Make cities and human settlements inclusive, safe, resilient and sustainable	2	2	0
Ensure sustainable consumption and production pattern	n.a.	1	n.a.
Take urgent action to combat climate change and its impacts	2	2	1
Global partnership for sustainable development	3	3	3
Gender equality	1	1	1
Public engagement	3	3	2
Learning/science education	1	2	2
Ethics	n.a.	n.a.	n.a.
Open access	n.a.	1	n.a.
Governance	2	3	1
Transdisciplinary advancement	1	3	2
Integration of local/traditional knowledge	0	2	0
Structural change	0	2	1
Pro-environmental behavioural change	1	2	1
Sustainability pilot-action(s)	2	3	2
Sustainability Transition Lab	1	2	3
Transferability/Replicability	2	2	3

Certainly, these values may have a degree of subjectivity, but they generally align with the trends and tendencies that can be deduced from the empirical qualitative data material collected through the impact monitoring process. It is also important to note, that the table does not comprise a “ranking” of the regions, but merely presents an approximation to the different dimensions that were important in the different local contexts. While it's important to note that the values presented in the table may be subject to debate, we can derive a synthetic “impact index” by aggregating the scores from each of the three columns:

- Extremadura: 23
- Ostrobothnia: 36
- Outer Hebrides: 23

While Ostrobothnia has achieved high values in the dimensions of governance, transdisciplinarity and the sustainability of pilot actions, Extremadura demonstrates notably high impact values associated with the Sustainable Development Goals (SDGs). The Outer Hebrides on the other side emphasised sustainability and replicability of the project. To conclude, the table highlights the fact that the RIPEET approach was tailored and adapted to different context, allowing for a prioritisation of efforts according to needs and requirements of the regional situation.

8. References

- European Commission. (2014). Responsible research and innovation: Europe's ability to respond to societal challenges. Publications Office. <https://data.europa.eu/doi/10.2777/95935>
- European Commission (2023) Climate change. Special Eurobarometer. Available at: https://climate.ec.europa.eu/system/files/2023-07/citizen_support_report_2023_en.pdf
- Holtrop, T., Meijer, I., Otero-Hermida, P., Amanatidis, A., Buongiovanni, C., Casala, D., Colonnello, C., Deserti, A., Feudo, F., Hartman, A., Hörlesberger, M., Ipolyi, I. M., Nguyen, N., Nieminen, M., Quinti, G., Ravn, T., Rizzo, F., Schmittinger, F., Steinhaus, N., Yaghmaei, E. (2022). Evaluative conversations: Translating between diverse stakeholders in regional RRI projects. *fteval Journal for Research and Technology Policy Evaluation*, 53, 77-84. <https://doi.org/10.22163/fteval.2022.544>
- Lang, D.J., Wiek, A., Bergmann, M., Stauffacher, M. & Martens, P. (2011). Transdisciplinary research unsustainable science: practice, principles and challenges. *Sustainability Science*, [online]. Available at: <http://DOI10.1007/s11625-011-0149-x>
- Luke, A., Cazden, C., Coopes, R., Klenowski, V., Ladwig, J., Lester, J. & Woods, A. (2013). A Summative Evaluation of the Stronger Smarter Learning Communities Project: 2013 Report-Volume 1 and Volume 2
- Patton, M.Q. (1996). A world larger than formative and summative. *Evaluation practice*, 17(2), 131-144.
- Patton, M. Q. (2006). Evaluation for the way we work. *Non-profit Quarterly*, 13(1), 28-33
- Phillips B. S. (1972) – Metodologia della ricerca sociale, Il Mulino
- RIPEET (2021) – D6.1. MONITORING, EVALUATION AND IMPACT ASSESSMENT – TOOLS AND PLAN.
- SMARTEES-Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability-Report D3.4 (2019). Report on Five Models of Social Innovation. Available at: <https://local-social-innovation.eu/resources/deliverables/>
- Stilgoe, J., Owen, R., and Macnaghten, P. (2013). Developing a framework for responsible innovation. *Res. Policy* 42, 1568–1580. doi: 10.1016/j.respol.2013.05.008
- Vadén T., Majava A., Korhonen J.M. and Eronen J.T. (2023) Energy Without Russia – The Consequences of the Ukraine war and the EU Sanctions on the Energy Sector in Europe. Friedrich-Ebert-Stiftung. Available at: <https://library.fes.de/pdf-files/bueros/budapest/20613.pdf>
- Volpe, M., Friedl, J., Cavallini, S., et al. (2016). Using the quadruple helix approach to accelerate the transfer of research and innovation results to regional growth, Committee of the Regions. Available at: <https://data.europa.eu/doi/10.2863/0082>
- A Monitoring Framework for Responsible Research and Innovation Strategic Development Plan 2020-24 <https://super-morri.eu/download/153/findings-and-deliverables/5179/d-1-2-strategic-development-plan-2020-24.pdf>
- Responsible research and innovation: a systematic review of the literature and its applications to regional studies. Available at: <https://www.tandfonline.com/doi/full/10.1080/09654313.2019.1625871>