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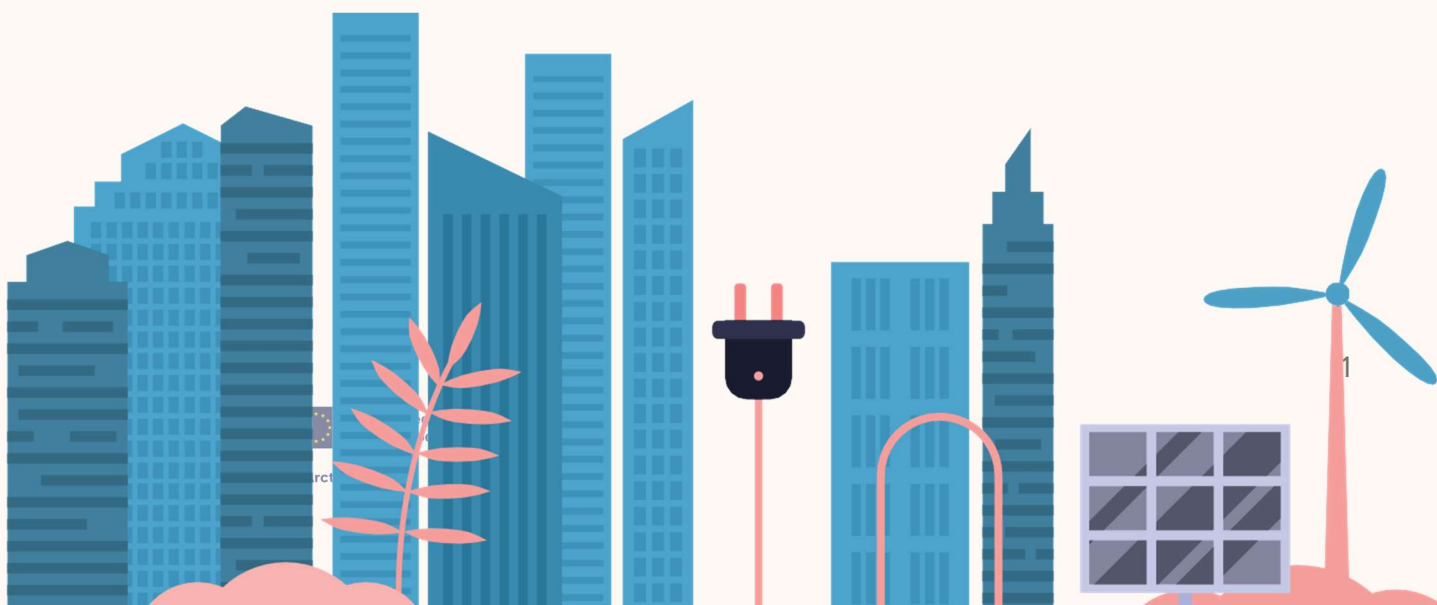
Northern Periphery and Arctic

D1.7.2 EVIDENCE-BASED STAKEHOLDER REPORT ON THE EFFECTIVENESS OF THE LIVING LABS MODEL

DELIVERABLE 1.7.2 BY UNIVERSITY COLLEGE CORK HYBES TEAM:

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Introduction

According to the European Network of Living Lab (ENoLL), Living Labs are defined as “user-centred, open innovation ecosystems based on a systematic user co-creation approach, integrating research and innovation processes in real-life communities and settings.” (ENoLL) Within HYBES a living labs approach is used as an innovative instrument to build knowledge, understanding and capacity for decarbonisation through co-design, participatory practices and to engage citizens as active agents of change.

HYBES has been experimenting with living labs approach across multiple sites to inform a replicable model for working across local and inter-regional innovation eco-systems. The living lab model and guide is defined, evolved and demonstrated through the following deliverables (see Appendix I - Overview of Activities and Deliverables):

- Deliverable 1.3.1 - Living Lab model Report
- Deliverable 1.4.1 - Five Quadruple Helix (QH) regional stakeholder workshops
- Deliverable 1.4.2 - Report on Stakeholder workshops & recommendations for policy
- Deliverable 1.6.1 - Reports on Cultural Events and Festivals as Platforms
- Deliverable 1.7.1 - Technical guide on the Living Labs as a tool for delivering behavioural change for decarbonisation
- Deliverable 1.7.2 - Stakeholder report on the effectiveness of the Living Labs model

This report is a final end of project view responding to Deliverable 1.7.2 Stakeholder Report on the Effectiveness of the Living Lab Model. It serves as a summative report on the project experience and learnings. It is informed by partners experience and stakeholder feedback, and the reflective practice mutual learning, and iterative co-design work evolved during the project.

In this report we reflect on the effectiveness of the model and consider the wider landscape of reports, policy documents, or new tools arising since we first began the project and developed the conceptual model. It informs and complements Deliverable 1.7.1 Technical Guide on the Living Labs as a tool for delivering behavioural change for decarbonisation. The Technical Guide is Intended as a user friendly guide and resource for wide dissemination. Literature informing our work throughout are collated as a curated repository of resources in the practice catalogue of the final technical guide. We conclude this report with forward looking recommendations for exploiting the learnings and results of the work.



The Living Lab Approach and Model for Hybrid Energy Solutions

In 2023 HYBES Project set out to conceptualise and refine a Living Lab model for Hybrid Energy Solutions in the NPA that could support regions to progress new knowledge-based solutions that advance our common agenda for decarbonisation. The refinement and evolution of a living lab model was central to the HYBES project and was conceived around a recognition that the scale and complexity of the challenge to achieve decarbonisation requires new ways of working and hybrid solution-making, working across traditional silos for systemic change.

The hybrid approach in HYBES blends:

- Working across both technical and social infrastructures and solutions
- Working across both demand and supply concerns i.e. energy efficiency and renewable energy
- Working across diverse geographic scales and contexts (neighbourhood, districts, region and transnational)
- Working across multiple levels of engagement to collaborate, co-create and effect behaviour change (citizens, education, planning and policy)
- Working with diverse actors and project partners from third level institutions, municipalities and energy agencies
- Working collaboratively at locally and trans-regionally in the NPA.

Early in the project the HYBES living lab approach was conceptualised as a practice model working with a knowledge eco-system framework. The model evolved together with project partners as they engaged with a range of regional stakeholders and advanced a mix of hybrid activities and solutions in their regions. As we come to the end of the project, we take stock of the project learnings, as well as policy and practice such as place-based innovation in regions, to consider the effectiveness of the approach and model. We call out successes to draw out key learning of what has been learnt from issues and challenges experienced along the way.

We particularly note the recently published ENoLL report ‘Living Lab Origins, Developments, and Future Perspectives’ (Schuurman, De Los Ríos White and Desole, 2025) as a milestone report that adds significant clarity to the diverse ways living labs can be formulated. This will greatly assist other actors seeking to activate living labs approaches and position them for

long term success. This report supports a clearer focus on different types of innovation practices that living labs can focus on as well as different living lab governance and business models that can be implemented in the longer term and is referenced throughout this report.

The final refined model and approach is presented in D1.7.1 Technical Guide on Living Labs as a Tool for Delivering Behavioural Change for Decarbonisation. This provides a guide for others interested in activating living labs, using the approach piloted in HYBES. The final model and guide is structured around:

- **Guiding Principles** to activate place-based living labs for decarbonisation.
- Orchestrating open innovation through **multi-level engagement** co-creating solutions at macro, meso and micro levels for systems change.
- Delivering a hybrid mix of solutions across **six dimensions** as levers for systemic change.
- Progressing activities through an **iterative process of Seeing, Informing and Making**.

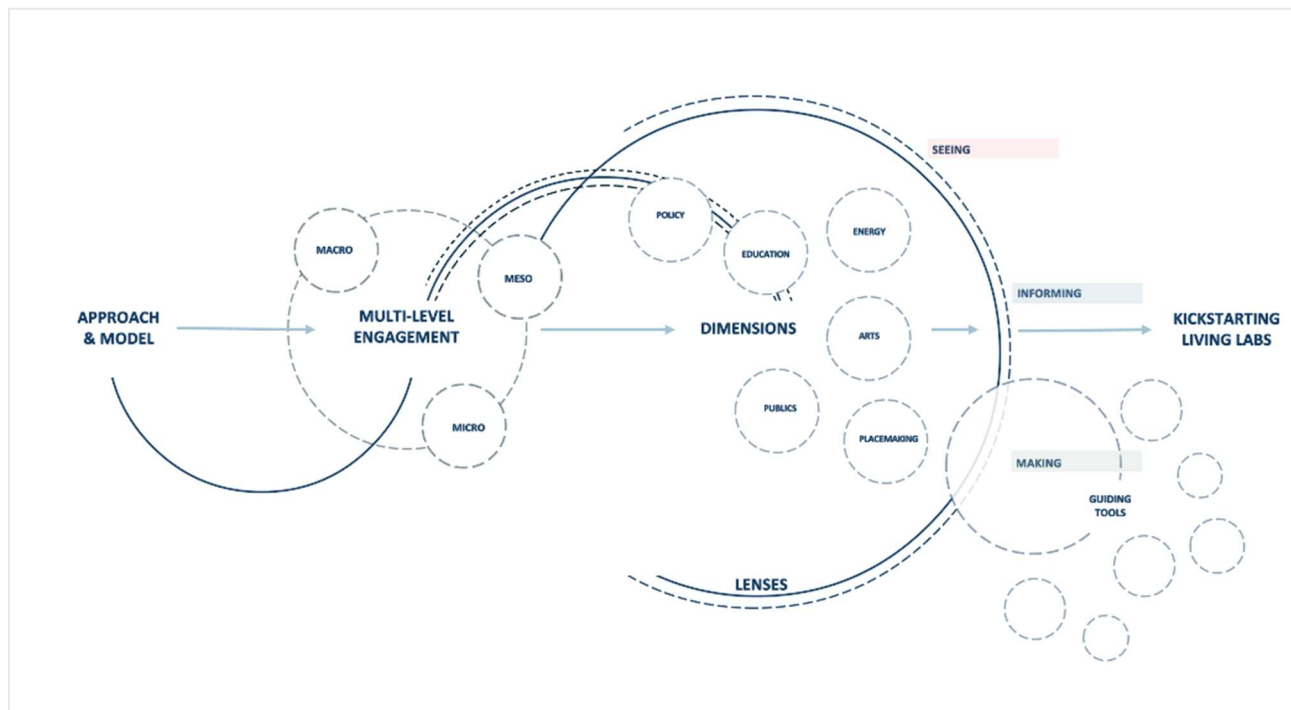


Fig. 1 The Refined HYBES model for Activating Living Labs for Decarbonisation

Learnings on the Effectiveness of the Model

Considering the practical experience and insights from HYBES as we defined, tested and refined the conceptual model, we take the Guiding Principles as reflective of the core aims of the living lab approach, and we use these to structure this report to consider the effectiveness of the model. The following table provides a summary view of the core aim of the Guiding Principles of the and the high-level key learnings identified in this report.

Multi-level Quadruple Helix (QH) Stakeholder Engagement, enhancing citizen engagement and collaborative participatory practices <i>The HYBES living lab model focuses on orchestration of open innovation through multi-level stakeholder engagement and collaboration. Multi-level engagement in living labs work at a micro, meso and macro levels, through mixed methods and with quadruple helix stakeholders i.e. academia, public sector, private sector and civil society. The aim of the approach was to be in keeping with good practice for living labs and to evolve practice insights through demonstration of engagement at each level</i>	Learning 1. The multi-level engagement element of the living lab model is effective to influence and catalyse change with diverse actors in the system.
Place-Based Approach for Hybrid Activities <i>The HYBES living lab model and approach is rooted in a geographic area. These can be diverse scales such as local neighbourhood, district, town or whole of region. This aim of the approach was to allow a common approach whilst ensuring relevant to local eco-systems.</i>	Learning 2. A place-based approach is effective to enable trans-regional collaboration, ensures contextual local relevance and supports working with both urban and peripheral communities Learning 3. Sustainable place-based living labs takes time and requires a high level of eco-system orchestration expertise. Embedding activities in territorial planning and development contexts and high level energy authority policy and programmes can be effective as an enabler-driven approach.

Assets and Anchors – Strategic Partners to Generate Value for All <i>The HYBES living lab model and approach focuses on embedding activities in a deep understanding of existing local conditions, informed by mapping and stakeholder engagement. The aim of the approach is to build on existing strengths, invite an asset based approach to community development and to work with strategic partners.</i>	Learning 4. A place-based approach requires a solid discovery phase to explore, test and enable foundational groundwork. Learning 5. Though requiring investment, preparatory work is effective to catalyse impactful new partnerships and collaborations. Learning 6. Anchor Institutions and Strategic Partners are effective to navigate constraints, leverage assets and affordances and shows potential as sustainable business model.
A Knowledge-Based Eco-System for Decarbonisation Transitions <i>The HYBES living lab model places co-learning at its core and proposes a knowledge based eco-system framework. The aim was to create mutual learning, knowledge and insight for inter-regional value and impact.</i>	Learning 7. Challenge of Scaling Successful Practice and Innovation – Transregional working is valuable. Thematic twinning can be effective and has potential for further development. Learning 8. Transdisciplinary and transnational co-creation work is effective. Building in more local Living Lab training build capacity and enhance effectiveness. Learning 9. Systems capacity and literacy for living labs is a challenge. A wider transdisciplinary community of practice could support local working. Learning 10. Ongoing Continuous Professional Development (CPD), Training and Education for new and existing professionals is required to meet needs of green industry, jobs in peripheral areas and future transdisciplinary competencies.
Design-Led Innovation Process for Systemic Change <i>The HYBES living lab model evolves design-led approach that is process driven, continuous and iterative in nature, informed</i>	Learning 11. Establishing a baseline view of current conditions is a fruitful exercise to inform impact-led local approach and an iterative co-design process supports evolving best-fit.

<i>by models such as design thinking and theory of change. The aim was to demonstrate and refine a flexible process-led approach to realising change and that could be applied to diverse scales and levels of living lab orchestration.</i>	Learning 12. Experience and evidence highlight that Artists, Creative and Cultural Sectors are effective for engaging publics. More research and experimentation required to build the evidence base.
Long term decarbonisation mission and short term pilots and interventions <i>The HYBES living lab works on long-term challenge of decarbonisation and enhanced engagement with communities. It supports testing, piloting and experimenting with short term interventions and knowledge development. The aim was to work collectively on a common challenge, whilst each region delivered a diverse mix of interventions and activities.</i>	Learning 13. The Dimensions are effective for orchestrating hybrid solutions using systems thinking Learning 14. The HYBES model and approach is strengthened by shifting from being challenge led to being missions-oriented from the outset.



Multi-level Quadruple Helix (QH) Stakeholder Engagement

The HYBES living lab model focuses on orchestration of open innovation through multi-level stakeholder engagement and collaboration. Multi-level engagement in living labs work at a micro, meso and macro levels, through mixed methods and with quadruple helix stakeholders i.e. academia, public sector, private sector and civil society. The aim of the approach was to be in keeping with good practice for living labs and to evolve practice insights through demonstration of engagement at each level.

Learning 1. The multi-level engagement element of the living lab model is effective to influence and catalyse change with diverse actors in the system.

The core proposition of HYBES was to work with a living labs approach that experimented with multi-level and multi-method approaches for stakeholder engagement. The aim of the model was to organise, stimulate and enhance learning and innovation by working with and though considering best practice living lab approach of working with the three-layer model (Schuurman, 2015) for living labs which acts at macro, meso and micro levels.

HYBES has been very successful at effecting collaboration, co-creation and progressing innovative new approaches, knowledge and solutions working across all three levels and connecting across the quadruple helix. This multi-level engagement is effective to influence and catalyse change with diverse actors in the system.

This can be especially effective when a specific ambition drives the purpose of all interactions; however, it can also be effective to experiment with diverse engagement to better understand needs, perspectives and opportunities within the eco-system to inform where or how new approaches might be needed or applied. A very clear and specific challenge-led approach in Iceland for example – to accelerate the take up of solar technologies – successfully worked at all levels to leverage multi-modal interventions towards the single common ambition and effecting behaviour change by policy makers and citizens. In Cork on the other hand the outcome of the process has been to identify a clear and novel approach to integrate living labs in implementation of town regeneration planning processes, effecting behaviour change in municipal citizen engagement practices for longer-term impact. In all cases, HYBES has been effective in stimulating knowledge transfer between organisations, utilising diverse methods and engaging citizens and

communities. Highlights of the value and effectiveness of working at each level and across the quadruple helix are expanded on in the following table.



Photos of HYBES stakeholder engagement activities in Cork, Umeå and Faroe Is. reflecting diverse settings & methods.

Interventions to enhance QH collaborations, partnerships.

At a macro level living labs act to broker knowledge transfer between local organizations and leveraging existing networks and assets to create a locally relevant change model

- Effective to mobilise strategic impact with regional influence (Bodø, Iceland, Cork)
- Effective in identifying clear long term partnership structures that will take forward actions initiated through HYBES living labs work (Cork, Iceland)
- Effective in strengthening Municipal and University relationships as implementers for legacy sustained working (Bodø, Umeå, Cork)
- Effective in organisational learning and securing stakeholder buy in to embed in long term place-based planning and development context. (Cork, Bodø)

- Effective in building senior level awareness and support for strategic advancement of decarbonisation agenda (Faroe, Cork, Iceland)
- Effectuated deepened sector-focussed relationships with industry, training and technical expertise collaborations (Iceland, Bodø, Faroe)
- Effectuated enhanced collaborations to overcome silos as key policy, regulatory and programme level system barrier (Iceland, Ireland)
- Effective in mobilising novel neighbourhood-focussed collaborations and partnerships to better reach citizens and communities (Umeå, Cork, Faroe)
- Effective in initiating new approaches and partnerships for collaborating with arts, culture and festivals (Umeå, Cork, Bodø)

Interventions at programmes / projects level in region or community.

At a meso level Living Labs act to enable multi-method and multi-stakeholder engagement and real-life experimentation.

- Projects involved over 100 stakeholder organisations from across the quadruple helix as strategic partners in collaborative projects and co-creation work. Conservative estimate that this represents over 300 partnering stakeholders from across these organisations, often include across departmental silos as well as site visits and international expert exchanges.
- Overall an effective mix of projects engaging a good range of stakeholder groups, in a diverse range of real-life setting and applying multi-method approaches
- Engagement with education institutions, connecting curriculum with energy monitoring in schools and developed a universal design approach for replicable model for decarbonisation in curriculum.
- Engagement with policy, regulatory environments and citizens, piloting grant incentivisation and addressing system barriers to technology adoption. Demonstrated a regulatory sandbox approach to policy innovation.
- Engagement with research on energy measurement in real built environment settings (building, districts) research on scenario modelling, and on renewable energy to inform urban planning demonstrated innovation in urban design and development as well as advancing research and knowledge on technologies
- Engagement with artists, schools, researchers and community organisations on harnessing potential for arts-based engagement, artistic research for decarbonisation contributes to new research, policy and practice paradigms

- Engagement with cultural festivals and events as spaces and formats to engage with publics highlights benefits of this approach
- Engagement with policy and programmes service providers to map policy contexts supported influencing local policy integration and implementation
- Joint working resulted in replicable universal and user-centred approach to web based guide focused on citizen engagement
- Practice learning evolution of living lab model and Guide suitable for wider dissemination to lead actors across the quadruple helix interested in activating place based approach to living labs for decarbonisation.
- Published article in peer reviewed journal, engaged research with 2 PhD projects

Interventions that directly engage individuals, citizens and neighbourhoods.

At a micro level living labs act to embed local activities and interventions for co-creation, citizen and community engagement in decarbonisation transition.

- Overall HYBES was effective in directly engaging citizens and communities during project and in developing knowledge and resources for legacy impact for citizen and community engagement e.g.:
- Wider publics - estimate of additional 700+ citizen/public stakeholders directly engaged through projects particularly through activities with workshops, local clinics, local schools initiatives, festivals, research activities, artists, and citizens through grant incentives, etc.
- Living Lab Guide, Citizen Guide to decarbonisation, Guide to Decarbonisation in Curriculum and Korter app are four key outputs that are suitable for ongoing use and application by other stakeholders, creating a legacy for future engagement with schools and citizens.
- Legacy outcomes in Cork and Iceland, will see sustained engagement with citizens and communities. In Cork through community engagement with Town Regeneration Planning, in Iceland with continued work to accelerate take up of solar through next iteration of grants, guidance and vocational training.



Place-Based Approach – Eco-System Enablers

The HYBES living lab model and approach is rooted in a geographic area. These can be diverse scales such as local neighbourhood, district, town or whole of region. This aim of the approach was to allow a common approach whilst ensuring relevance to local eco-systems.

Appendix I provides the region by region view of the place-based approach to activating living labs, collating partner and stakeholder feedback into a practice-led final view on the local experience. Here we consider two key learnings from the project related to this Guiding Principle for a place-based approach.

Learning 2. A place-based approach is effective to enable trans-regional collaboration, ensures contextual local relevance and supports working with both urban and peripheral communities

The developing and refining a living lab approach has been an essential component and central axis for HYBES, but from the outset a key challenge has been - how to develop and refine a coherent approach across the complexity of different NPA regional cultural, societal, environmental, and regulatory contexts as well as the hybrid mix of project activities?

We note that there are a wide variety of energy and environment focussed living labs however, the experience of this project, and literature in the field, highlights the diversity of living labs in application. At the core they are ‘deeply rooted entities within their respective environments...inherently shaped by their unique surroundings and networks of stakeholders’ (Schuurman, De Los Ríos White and Desole, 2025). There is no one-size fits all living lab model.

Within HYBES, we cohered the multi-regional efforts through taking a place-based approach as a core guiding principle. This focussed on determining local needs and opportunities with stakeholder perspectives to inform transformative innovation and systemic change. It provided flexibility for local actors to determine appropriate local application, whilst supporting trans-national coherency between regions.

Project stakeholders consider the place-based approach as effective for enabling organisational and trans-regional working whilst ensuring local adaptability and relevance. It supported the mutual learning for joint working and sharing best practice.



The place-based approach is also effectively well positioned to align with and leverage JRC Innovation in Territories¹ and JRC Partnerships for Regional Innovation² as a strategic framework for territorial transformation.

We particularly note its resonance with the newly published JRC guidebook ‘Navigating Opportunity Spaces A Practitioner’s Guide to Linking Climate Adaptation and Place-Based Transformative Innovation Policy’(Matti et al., 2025)³. This publication offers hands-on resources to practitioners seeking to address impacts of climate change through local place-based approach and is included in the Practice Catalogue section of the HYBES Guide.

Place-based approaches are evident in other living labs, though are often applied in distinctly urban contexts as Urban Living Labs and are associated with supporting policies, governance, collaboration and innovation eco-systems (Schuurman, De Los Ríos White and Desole, 2025) Whilst the HYBES model resonates with these, a distinctive aspect of the HYBES place-based living lab approach is its appropriateness for peripheral regions rather than just high density urban centres. This is particularly important for the unique territorial and decarbonisation needs and issues of the NPA regions. This place-based approach was effective for allowing flexibility for a wider-lens to support regional approaches for working with peripheral communities outside of major urban centres. The Cork, Iceland and Faroes approaches in HYBES particularly demonstrate this.

Learning 3. Sustainable place-based living labs takes time and requires a high level of eco-system orchestration expertise. Embedding activities in territorial planning and development contexts and high level energy authority policy and programmes can be effective as an enabler-driven approach.

The project duration demonstrates that activities over a 2-3year timeframe can successfully result in a new partnerships and collaborations but more sustained efforts to consolidate, sustain and operationalise place-based living lab approaches should be considered as a longer-term ambition that requires senior support and mandate. Strategically positioning activities in regional planning and development planning and policy can be effective for realising continuity and sustain learning and development as part of a longer-term ambition.

¹ JRC Innovation in Territories - [Innovation in territories - Joint Research Centre - European Commission](#)

² JRC Partnerships for Regional Innovation Playbook [JRC Publications Repository - Partnerships for Regional Innovation Playbook](#)

³ JRC Navigating Opportunity Spaces [JRC Publications Repository - Navigating Opportunity Spaces: A Practitioner's Guide to Linking Climate Adaptation and Place-Based Transformative Innovation Policy](#)



This is also reflected in the literature. HYBES has been effective in demonstrating the potential to ‘activate’ living labs in ways that can support activities to transition or mature. We can therefore consider it effective as an enabler-driven approach.

“One of the main challenges identified in the literature is the long-term sustainability of Living Lab organisations. Research has shown that many Living Lab initiatives evolve, change form, or cease to exist over time....

Public Funding Model: Many Living Labs rely on government grants or public funding, such as EU funding programmes, particularly in their early stages. These Living Labs typically address public interests, such as urban development, social innovation, or sustainability. Starting from this model, often referred to as “Living-Lab as a Project”, many Living Labs transition to other models as they mature and become more independent in their strategic ambitions. This type of Living Lab is often described as enabler-driven.” (Schuurman, De Los Ríos White and Desole, 2025)

The HYBES living lab model supports this type of enabler-driven ‘Living Lab as Project’ that can potentially evolve to become more sustainable. The duration of the project and guide therefore focuses on ‘activating’ living labs.

HYBES experience is that a sustainability requires establishing the value proposition and buy-in for consolidating longer-term boundary spanning partnerships and infrastructures. This takes time and ultimately requires a strategic long-term view, resourcing and decision maker buy-in. In practice HYBES living labs activities were being delivered by a mix of organisations and partners: energy agencies, universities, municipalities, operating across different functions and levels and with varying levels of influence within diverse parts of local collaboration, engagement and decision-making structures. Partners faced different positional, institutional and systems constraints or affordances. Some but not all regions have ambitions to progress the living lab beyond this work of ‘Living Lab as Project.’

Based on project experience, feedback and reflections, one factor might be that effectively mobilising and sustaining this type of place-based living lab requires a high level of ecosystem orchestration expertise to steer the emergence of a local value proposition, and build relational governance for decision making and buy-in.

A clearer value proposition and a stronger mandate and expertise for the brokering and boundary spanning work were more effective in realising transformative impact or evolving



potential for more sustained living lab approaches and activities. Successes were often made possible by a strong collaboration with built environment regional planning and development, or national energy authority work programmes. In this respect, embedding activities in existing regional spatial planning and development contexts can be seen to be effective for this type of enabler-driven approach.

Assets and Anchors – Strategic Partners to Generate Value for All

The HYBES living lab model and approach focuses on embedding activities in a deep understanding of existing local conditions, informed by mapping and stakeholder engagement. The aim of the approach is to build on existing strengths, invite an asset-based approach and to work with anchor partners that can support brokering and engagement.

Learning 4. A place-based approach requires a solid discovery phase to explore, test and enable foundational groundwork.

To ensure solid foundations would be built on robust understanding of local needs as well as planning for joint transnational working, the initial conceptual model for the HYBES Living Lab Model (HLLM) was informed by deep mapping and scoping activities in the first year which included:

- desktop research to inform theoretical and methodological underpinning (D1.3.1).
- local regional project initiation, priority stakeholder meetings, scoping activities and transnational co-creation sessions with living lab lead staff to support mapping local context and framework conditions (D1.3.1).
- joint action planning and policy mapping – which provided an overview of the national, regional and local policies, plans and legislation in place in each of the HYBES partner regions (Ireland, Norway, Sweden, Iceland and the Faroe Islands), creating a policy context to maximise the potential of the quadruple helix actors in facilitating decarbonisation across the NPA region (D1.1.1).

This work took longer than was originally anticipated for in the project proposal, however was considered critical by partners as they worked with living lab approaches at local level. During the first stages, each region refined a clearer articulation of the local context - people, place, policy – and formulated a starting position for how the HYBES initiative and living lab approach might be meaningfully oriented locally. This emphasised a clear focus on identifying the opportunity space for adding value and potential for long term impact,



balanced with the practicalities of what can be feasibly delivered sensitive to the existing conditions. In practice, this groundwork was critical to realising many of the successful outcomes that are now embedded in sustained activity being progressed beyond HYBES.

Learning 5. Though requiring investment, preparatory work is effective to catalyse impactful new partnerships and collaborations.

Building on the first phase, each partner region progressed diverse and hybrid mix of local activities through the project pilots and other opportunities arising. The practical evolution of the overall place-based approach progressed as partners worked to visualise, cohere and articulate their mix of activities as an integrated body of work. This was primarily delivered through the project pilots.

The project experience highlights the significant work, expertise and resources required to successfully develop and deliver local living labs. For some regions the living lab approach supported a wider effort and helped consolidate a clear narrative and ambition emerging as a high impact opportunity and strategy for their local context. For others, there was a less coherent mix of interventions, but activities served as an important experimental and learning space that informed critical relational or knowledge-based foundations for ongoing work. For all regions, the work catalysed new partnerships and collaborations.

The duration of the project is therefore considered effective as a discovery phase to activate a place-based approach given the complexity of working at systems level and is not sufficient to operationalise a sustained infrastructure and governance model. During this discovery period leading actors can mobilise the strategic positioning, buy-in and support needed for longer term success whilst experimenting or demonstrating new solutions and strategies. The process tested during the project demonstrates a successful roadmap for progressing preparatory actions that can serve as catalyst or groundwork for new partnerships and collaboration that could be evolved to operationalise more sustained local living labs.

Learning 6. Anchor Institutions and Strategic Partners are effective to navigate constraints, leverage assets and affordances and shows potential as sustainable business model.

As mentioned, HYBES living labs activities were being delivered by a mix of organisations and partners: energy agencies, universities, municipalities, operating across different



functions and levels and with varying levels of influence within diverse parts of local decision-making structures. In practice partners faced different positional, institutional and systems constraints or affordances.

When thinking about place-based living labs, this presents an opportunity for harnessing local strengths but also presents a challenge and risk to effectively navigate and meaningfully position living labs amidst multiple citizen interfaces and inter-agency partnership structures and avoid duplication or adding more noise and complexity. In reality, stakeholder fatigue and citizen disenfranchisement is a real challenge for those wanting to support citizen engagement. Equally, depending on the area of focus, often a degree of specialised knowledge is required, or a more targeted focus on certain groups within the quadruple helix at different stages is more relevant than directly engaging citizens or engaging all stakeholders in any individual workshop or session.

Anchor institutions and partnerships can be critical to navigate these considerations. They can support a joint effort to align and leverage networks for decision making, influence, reach and brokering engagement with key cohorts. Municipalities and energy agencies for example often have strong links to planning and policy, universities having strong links to research expertise, community organisations, housing associations and cultural organisations having strong links to citizens, residents and publics. A new collaboration with a housing association in the neighbourhood approach in Umeå for example proved effective for engagement with local residents; whilst relationships between municipality and energy sector actors and architectural environments was enhanced in Bodø new district development, and in Iceland the energy agency had mandate and networks to mobilise significant policy innovation for the region.

The HYBES pilot interventions with festivals and co-creation work with artists also demonstrates that there is room to better leverage collaborations with arts and culture as key partners and brokers for supporting engagement with publics and citizens.

Stakeholder feedback identifies that some form of new, improved or deepened stakeholder relationships is one of the key positive impacts from the work. In the complexity of local conditions however, it is also clear that clarity of purpose for living lab activities is essential to underpin strategic partnerships for effective working and unlocking potential for transformative impact.



Municipalities and Universities as anchor institutions, deeply rooted in their communities and playing a significant role in local economies and social structures, are well positioned to support sustained partnerships as anchor partners for operationalising living labs approaches. This is demonstrated in the Cork context, where a new sustained collaboration between University and Municipality has been established. Equally in Bodø, the approach was embedded in major city planning and development working with strategic partners, and underpinned by research for evidence informed planning. In Umeå HYBES is part of ongoing City-University knowledge partnerships for energy solutions. All of this suggests potential for maturing to more sustainable business model for living labs for decarbonisation, where partners or consortia pool resources to boost regional innovation capacity. This is described in the literature as a Partnership Model where “Costs and benefits are shared, often blending private investment with public funding or academic grants.” (Schoorman, De Los Ríos White and Desole, 2025)

A Knowledge Based Eco-System for Transitions

The HYBES living lab model places co-learning at its core and was guided by a knowledge based eco-system framework. The aim was to create mutual learning, knowledge and insight for inter-regional value and impact.

Learning 7. Challenge of Scaling Successful Practice and Innovation – Transregional working is valuable. Thematic twinning can be effective and has potential for further development.

At the outset a knowledge eco-system framework was established. This included transnational learning, best practice transfer, local collaborations in real-world settings through pilots and exploring approaches to engaging citizens and communities. HYBES partners report that it was beneficial to share practical knowledge and experience of practices. This was advanced through a Mutual Learning approach, practitioner-focussed reflective practice and joint solution development as well as the Co-Creation Cafes.

Two common issues were identified by project partners during HYBES in this respect. Firstly, as pilots progressed and partners sought to identify joint solutions, or to determine which best practices were useful to share and how, it became clear that a process, mechanism and platform was needed to support the collaborative working. Integrating co-creation work in partner meeting was effective to support joint working.



The second issue identified by partners, was that it was clear that multiple types of good practice were emerging from the transnational collaboration, however just identifying the good practice example is not sufficient. The reality is that most practice examples have very specific local conditions that enabled their success, and extended dialogue is required in order to identify the salient learnings for adaptability, scaling or replicability to other regions and contexts.

The evolution of the model included then a dedicated Mutual Learning exercise activity as co-creation session delivered during the in-person partner meeting in Cork and supported the partners to evolve the inter-regional collaborations and knowledge exchange around local practices and activities. Where partners had identified a variety of examples of good practice in their regions, the session supported partners to evolve the three priority focus themes for best practice exchange. Partners were twinned around these themes for the Co-creation Café.

The Co-creation café was an experimental approach piloted in HYBES based on this approach to theme and twin partners to support the best practice exchanges between regions. In addition to twinning partners, it also proposed a format that allowed a deep dive into the practice examples. The HYBES LL Guide on Co-Creation Cafes provides a conceptual framework model and method for supporting this type of peer to peer best practice exchange and knowledge based-ecosystem, organised around the pedagogical model of Mutual Learning Exercises.

Whilst this is piloted thematic twinning and a virtual platform approach to supporting inter-regional exchange and sharing of best practices was considered as showing potential for further development. Given the limited scale in HYBES, the experience and feedback suggests that this can be a useful format for co-learning and inter-regional exchange, but that further refining, testing and development of this would be useful. Considering the ENoLL view of potential business models for living labs (Schuurman, De Los Ríos White and Desole, 2025) we note this could form the basis of a Membership Model approach for an inter-regional living lab activities, and could be matured as a service-led platform which provides member organisations with valuable knowledge, networks, tools and match-making services.

Learning 8. Transdisciplinary and transnational co-creation work is effective. Building in more local Living Lab training build capacity and enhance effectiveness.



Whilst there is sustained commitment to taking forward the learnings or legacy aspects of HYBES across all partner regions, there are varying degrees of momentum towards consolidating a sustained living lab as an adopted organisational and governing mechanism for collaboration and eco-system orchestration around decarbonisation ambitions. The project therefore successfully defines and refines a living lab model, but actualising the model would require additional time, resourcing and capacity building.

The HYBES partners represent a cross-section of experts with significant skills and experience across a mix of fields and disciplines including planning and development, community engagement, user-led design, technical energy or built environment expertise, participatory practices and so on. It is clear there was extensive expertise and competencies contributing to project successes. That said, it is also true that local partners had diverse understanding, expertise or experience in the place-based model of living labs as orchestrators of open innovation eco-systems, as was conceived in the original model. This included diverse understandings of related concepts and terminologies, practices and processes. This is further compounded by the wide diversity in type and application of living labs. As the project plan included no provision for training or engaging local living lab expertise, we see that this presented challenges for translating, communicating and mobilising the approach.

The project experience suggests building in living lab training would be beneficial. A more dedicated focus on resourcing living lab training should be built into Living-Labs-as-Projects, supporting lead local actors to translate and adapt the model. Given the diversity of living lab approaches and the fact this is becoming an important and specialist field of practice, training would not only build capacity within the regions, but would support lead actors to effectively develop best fit living lab applications in local contexts.

Learning 9. Systems capacity and literacy for living labs is a challenge. A wider transdisciplinary community of practice could support local working.

A critical learning from the HYBES experience and reflective practices, was the consistent challenge that living lab terminologies can be obtuse and there was a need to translate and re-frame the work in terms that are relevant to stakeholders being engaged. This raises this critical issue also of climate communication – how to effectively communicate climate mitigation projects to citizens and stakeholders. Inspiring examples were identified, including creative engagement through interactive futures-thinking initiatives, and the



project has piloted multiple modalities for citizen and stakeholder engagement. Thus the work of communicating and framing engagement activities is essential in any given activity, particularly at micro and meso levels of operating, to support buy-in to specific activities or ambitions. Yet, the challenge of systems capacity and literacy for the living labs language can be a barrier to building and sustaining a longer-term macro-level living lab approach.

None the less, there was evidently significant expertise for many of its component approaches and practices such as collaboration and engagement, climate communication, participatory practices and local innovative approaches within the partners immediate network and beyond. To some extent however these are fragmented, in diverse part of the system silos across disciplinary, citizen, community, industry, policy or by sectoral interests. These practices were more readily understood through these framings. Partners were effective in leveraging these local strengths and competencies during the project, this type of transdisciplinary working was a strength and is central to living labs approaches. Partners also identified other projects, practices and hubs beyond the HYBES project delivering good practice or acting as innovation hubs or living labs.

This suggests there is opportunity to better connect and support knowledge transfer to build on the existing competencies and assets to strengthen wider systems capacity for transdisciplinary approaches. This should include building systems literacy for living labs as a movement for utilising these collaborative and adaptive methodologies to collectively tackle wicked problems. Connecting the community of practice would enable better networking, surfacing best practice, sharing knowledge, but importantly strengthen visibility and awareness to support local efforts.

Learning 10. Ongoing Continuous Professional Development (CPD), Training and Education for new and existing professionals is required to meet needs of green industry, jobs in peripheral areas and future transdisciplinary competencies.

Considering the knowledge-ecosystem, we can also see the need for CPD and other training and educational offers for existing and new professionals in industry to support the transition to decarbonization emerging from the project experience and engagement with stakeholders. However industry needs, local contexts, educational offers remain fragmented and slow in response to the pace of complexity and scale of change.

As mentioned, Third level education as an anchor partner for place-based living labs for decarbonization is considered critical. Region-level approaches to living labs can enhance



quadruple helix dialogue between third level education, industry, municipalities, energy agencies and utilities and other stakeholders to deepen systems-level thinking and enable solutions to be devised based on local needs. Sustained partnerships and long term joint strategies and collaborations are needed to accelerate responses that support skills needs for territorial transformation and decarbonization ambitions.

HYBES experience suggests working with third level education and vocational education training is effective to address skills needs and support jobs in peripheral areas. Connecting with schools and young people is effective for future skills as well as influencing parents and communities. The HYBES focus on working with education as a core dimension was a strong and effective approach in HYBES, whilst stakeholder engagement, good practices and literature identifies CPD, vocational training, innovative curricula and research needs for green industries and jobs at various levels.

Additionally, the evolving nature of climate change, new ways of working and technological advancements means knowledge sharing and education of all professionals and communities is a vital component to combating the problem. There is a need therefore for professional development for climate focused transdisciplinary skills and competencies. This can be effected through train the trainer approaches. Policy increasingly recognizes the need for these type of key competencies for collaborative, co-creation practices that adopt a transdisciplinary lens - including the NEB Compass Working Principles and JRC competencies frameworks.

Creative and Design-Led Innovation Process for Systemic Change

The HYBES living lab model evolves design-led approach that is process driven, continuous and iterative in nature, informed by models such as design thinking and theory of change. The aim was to demonstrate and refine a flexible process-led approach to realising change and that could be applied to diverse scales and levels of living lab orchestration.

The HYBES living lab approaches was interested to examine how we can systematically enhance citizen and community engagement through living lab and transdisciplinary practices and approaches. The original conceptual model focusing on Impact by Design at the outset and proposed a Theory of Change approach. As discussed, it became apparent that in practice partners first needed to discover how a living lab might be positioned and create a value-add proposition in the local context. Whilst a Theory of Change approach was still considered good practice in the context of mature and evolved co-governance and



agenda setting, a simpler log-frame was devised to support results-based frameworks for less mature settings. In practice however it became evident that, even this simpler log-frame assumes a more matured living lab than was realistic to achieve during the duration of the project. None the less, the evolution of the log frame is considered effective for supporting the ambition to be enabler-driven and supports the pathways to maturing living labs. Additionally, whilst the full formulation of a Theory of Change was not realised, the impact-driven focus that underpinned initial formulation local approaches is considered a contributing factor to successful outcomes.

Learning 11. Establishing a baseline view of current conditions is a fruitful exercise to inform impact-led local approach and an iterative co-design process supports evolving best-fit.

The project experience demonstrates that a first action of engaging quadruple stakeholders through workshops is an effective strategy to build a clearer understanding of the current eco-system and ensure that from the outset, interventions are informed by diverse stakeholder perspectives. The first workshops supported mapping existing arrangements and interacting with a deeper understanding of stakeholder concerns, including existing programmes and forums seeking consultation and engagement. The collation and interpretation of the first phase of ‘seeing’ existing arrangements assisted lead actors to get a clearer picture of strengths, opportunities, aspirations and results being sought through the work. They considered the high level ambitions and focussed activities on the meaningful short term actions that could be delivered during the project. The process of engagement itself was valuable, whilst the interpretative work of ‘informing’ a ‘baseline’ as an output is an important record from which actors can iterate and reflect on progress as they progress into solution ‘making’. The baselines serve as an important snapshot of the current state and existing conditions, enabling actors to focus attention on opportunities and challenges for intervention at different levels. The over-arching emphasis on the evolution of best-fit actions around activating living lab activities using an iterative design-led process is considered an important and effective component of the work. The iterative seeing-informing-making process is a useful lens for evolving the living lab approach and for developing strategies and practices for orchestrating the work.



Considering this emphasis on impact by design from the outset, though ultimately the ambition of applying a results based framework was not achievable within the project the living lab approach was effective in being impact-led, resulting in clear high level impact in some regions. It was also effective in catalysing actions towards long-term decarbonisation change ambitions whilst also delivering valuable shorter term actions that could meaningfully progress work within the scope of the HYBES project period. Additionally, that tools have been developed to enable actors to continuously evolve to more systematically embed a formative impact-by-design logic model at an appropriate juncture is considered a positive output.

Learning 12. Experience and evidence highlight that Artists, Creative and Cultural Sectors are effective for engaging publics. More research and experimentation required to build the evidence base.

Additionally to the living lab approach is rooted in design-led approaches and co-creation practices, HYBES also explored the potential of arts, culture and creative practices to contribute to the decarbonisation agenda. We note the valuable report [Creative Industries and the Climate Emergency](#) (Creative PEC, 2022) which highlights roles for the Creative Industries as part of the Net Zero transformation as:

1. Decarbonisation Reducing - greenhouse gas emissions directly and indirectly caused by creative industry operations and business activities in line with UK and global greenhouse gas (GHG) emissions reductions targets.
2. Tangible contributions activities towards Net Zero transformations - Ways in which Creative Industries skills, outputs, and work will directly shape Net Zero communities, products and infrastructure (such as architecture, design, digital technologies).
3. Intangible contributions towards Net Zero transformations - Ways in which Creative Industries will influence cultural shifts, attitudes, behaviours, education and engagement linked to societal Net Zero transformations.

HYBES activities explored the third aspect, considering artistic research practices, arts-based engagement and festivals and cultural events as platforms for stakeholder engagement. Though limited scope for deep exploration, the project experience shows these approaches as effective and identified useful resources and practices to support



future working. It is identified as a key opportunity space, particularly in the Cork context, where HYBES learnings will contribute to ongoing research and maturing of living lab approaches. In particular, aligned with the considerations for climate communications and challenges for citizen engagement, it is considered that creative, design and artistic professions bring key skills and competencies that can play a key role in formulating process-led engagement strategies.

Temporality and Decarbonisation as a Long Term Strategic Mission

The HYBES living lab explored multiple temporalities for decarbonisation. It supported testing, piloting and experimenting with short term interventions and knowledge development, whilst focussing on longer term change ambitions. The aim was to work collectively on a common challenge of decarbonisation, whilst each region delivered a hybrid mix of interventions and activities.

Learning 13. The Dimensions are effective for orchestrating hybrid solutions using systems thinking

Over the duration of the project, activities progressed the thinking around the emerging common transnational themes arising. The local applications highlighted the complexity of local efforts and informed the need to refine a stronger emphasis on systems-thinking in the final model. Identifying and building on best practice, HYBES drew from the ‘Mission-oriented innovation - a handbook from Vinnova’ and in particular their articulation of using a lever strategy to enable systemic change. They point to identifying levers as ‘existing infrastructural elements which can be powerfully exerted in different directions... (are) relatively easy to access, but that exerting them differently can produce markedly different results’ (Hill, 2022)

HYBES has been effective in demonstrating delivery of a hybrid approach working with diverse parts of the system. The refined living lab model builds on project learning and recognises that activities can be translated as having identified and worked with a key set of systems levers. We therefore think the clear identification of six dimensions as levers for change is an effective structure for supporting hybrid solutions, whilst recognising that the dimensions worked with in HYBES are not exhaustive or definitive. Throughout the project, for example, partners recognised the critical intersection of the energy agenda with other programmes and policies that contribute to the wider decarbonisation agenda. These included food systems, biodiversity, circularity. There is certainly opportunity for future



practice and research to progress the work on further embedding and developing guidance for systems-thinking and identifying relevant dimensions as levers for systems change.

Learning 14. The HYBES model and approach is strengthened by shifting from being challenge led to being missions-oriented from the outset.

The initial living-lab model invited local actors to take challenge-led approach to framing the living lab activities and interacting with partners and stakeholders. As the project and work of framing the local challenge evolved, it became more effective in practice to focus on a core focus areas and better understanding not only the challenge, but also the value proposition of the living lab approach within the distinctiveness of each regions eco-system (schools, policy, inter-agency structures etc).

Through the mutual learning work and co-creation workshops at the Cork partner meeting, the partners worked to visualise, cohere and articulate their mix of activities as an integrated body of work locally and transnationally under the broader ambition of decarbonisation.

Taking the practice learnings and a stronger emphasis on systems thinking we look to other good practice developments in the field that are progressing missions-oriented approaches. The refined living lab model therefore makes an important shifts from being challenge-led to being missions oriented. This is in keeping with the impact-driven lens and current thought leadership, policy and practice. This aligns with the evolved learning for hybrid solutions as an approach to working to identify and work with system levers in real life settings to effect systems change.

This is an important refinement of the model based on evaluation on effectiveness and informs the design and approach to the Technical Guide and Practice Catalogue to share the experience that HYBES as has experimented working across these dimensions. Evolved through mutual learning the practitioner-led approach to identifying the dimensions as levers for systems is considered a strength. It is expected that a missions-oriented approach from the outset would enhance effectiveness and add clarity to the initial stages of work in developing a place-based approach.

Considering Missions, we note that this shift also offers opportunity for stronger alignment with the EU Mission Cities. This would support potential for alignment in regions where this is already active, and for other territories, there is opportunity to learn from the existing good practice being progressed in the Mission Cities work.



Building on the HYBES Legacy

The final ***Guide to Place-Based Living Labs for Decarbonisation*** focussed on practice and process to support professionals to explore, define and develop a locally relevant and contextualised value proposition for a place-based living lab for decarbonisation in their region. It serves a knowledge-based resource suitable for wide circulation as a final project output.

As HYBES closes out and look ahead to taking the outcomes of the project forward, project partners have identified and committed to a number of actions to jointly build on the HYBES legacy, beyond the localised efforts which will progress activities in their own regions. We note these below:

- At our final partner meeting, project partners identified that the inter-regional collaboration in HYBES and the relationships established was a strength to build on. Potential future calls were identified as pathways to continue inter-regional collaborations and shared ambitions to continue to inform new solutions for decarbonisation in the regions. Partners committed to a post-project working meeting to explore the possibility of a joint submission to build on HYBES.
- Among the opportunities, partners and external speakers especially highlighted the opportunity to engage with New European Bauhaus – both as a community of practice (e.g. Chapters) and as a financial instrument.
- A number of project partners in HYBES are also partners in another project Bauhaus Goes North, which includes a living lab component. UCC as lead partners for this deliverable, will capitalise on the HYBES model by applying it to this project. This will further advance the evidence base for the living lab model and approach and test its adaptability for working with the project focus on NEB Compass principles and circularity. In particular it will be evolve the pilot of Co-Creation Café's and utilise the process lens 'seeing – informing – making' developed in HYBES.
- At the final meeting partner noted that the EU Arctic policy - European Commission has launched a call for evidence and public consultation and open to the submissions until 16 March 2026. Partners will consider developing a submission to the consultation building on the HYBES final deliverables.

Lastly, we conclude this report with a series of broad recommendations for activating Living Labs for Decarbonisation in NPA Regions. These are aimed at key actors who are involved in



driving the decarbonisation agenda. We advocate for advancing the knowledge and know-how for transdisciplinary working to support regions in transition. At its core, transdisciplinary practice reflects a shift to see citizens and publics as well as multi-disciplinary expertise working together on innovating new solutions. It requires more and stronger co-creation practices, moving from information-giving or consulting with publics and communities to more meaningfully empowering communities and citizens as active participants and agents of change. Living Labs are an innovative instrument, field of practice and wider movement that can support this. HYBES has experimented with taking a unique approach to working with hybrid solutions for decarbonisation, considering how activating living labs can support leading actors to orchestrate new solutions in the complexity of their territorial settings.

Closing Recommendations

This report presents a culmination of mutual learning progressed throughout the HYBES project. Specific activities that have provided key spaces for mutual learning and insights as continuous evaluation to inform the effectiveness and evolution of the model are:

- Ongoing collection of best practice and knowledge resources locally and shared through project meetings. Specifically captured together with stakeholders at the first stakeholder workshops. A curated catalogue of best practices and resources is included in the final guide.
- Workshop on approaches to stakeholder engagement during in-person partner meeting in Umeå, reviewing living lab approach, trouble shooting and planning for local focus and stakeholder engagement.
- One to one consultancy meetings with partner regions to both support the local approach and take feedback to inform the evolution of the model.
- Evolution of the value proposition of joint solutions during in-person partner meeting in Faroe Islands.
- Co-Creation Workshops as Mutual Learning Exercise during in person partner meeting in Cork, focussed on finalising joint solutions, distilling priority themes for Co-Creation Café (best practice and emerging dimensions), holistic view of the living lab across project activities and planning for collecting stakeholder reflections.

- Co-Creation Cafes providing a mutual learning activity deep dive into key emerging dimensions and building on the sharing of good practice including implementation insights.
- Partner feedback and reflective review and evaluation of the Co-Creation Café at in person partner meeting in Bodø and final project phase reflections and planning, particularly on capitalisation and legacy.
- Final partners in person meeting in Copenhagen presenting results from deliverables and reflecting living lab approach including external speaker.

From this and looking to the future, we proposed a final series of closing recommendations to best build on the learnings of HYBES and advance the knowledge and practice for Place-Based Living Labs for Decarbonisation in the NPA regions.

1. Regional actors should experiment with activating *Place-Based Living Labs for Decarbonization* in northern peripheral arctic regions connected to built environment policy, planning and development at region level and plan for continuity, ensuring that knowledge developed is sustained beyond one-off projects.
2. Activating *Place-Based Living Labs for Decarbonization* should, in the first instance, be enabler-driven, anchored by partnerships between Higher Education, Municipalities and Energy Agencies progressing macro-meso-micro level strategies for systems approaches to the socio-technical transition.
3. Activating *Place-Based Living Labs for Decarbonization* living labs should be mission-oriented and focus on research, innovation, knowledge and learning within the system (including CPD, Mutual Learning, Engaged Research and Policy). Vocational Education Training and European Universities should be considered a key actor in this space.
4. Activating and sustaining *Place-Based Living Labs for Decarbonization* should aim to systematically enhance citizen and community engagement through transdisciplinary and co-creation practices and approaches. Lead partners should incorporate capacity building measures for transdisciplinary practices such as professional development, train the trainer and engagement with communities of practice platforms and fora.

5. Activators of *Place-Based Living Labs for Decarbonization* should engage with Artists, Creative and Cultural Sectors to enhance engagement strategies with publics, to design co-creation processes or to consider regional innovation spillover effects of these sectors.
6. *Activators should approach the HYBES model and Guide for Place-Based Living Labs for Decarbonization as an invitation to continue research and practice-led learning that further refines the model, recognising living labs as a wider movement rather than a static model.* Areas that would benefit from further research and practice-led development include: the (i) Co-Creation Cafés as a platform-based approach for Twinning and Mutual Learning to Accelerate Best Practice; (ii) Further testing and potentially adding to or refining the Dimensions as Systems Levers particularly including exploring highly inter-dependent policy areas such as food systems, biodiversity/nature-based solutions and circularity; (iii) Piloting a more mission-oriented approach; (iv) expanding the model to include a stronger focus on an intersectional view of decarbonization for just transitions.
7. *Lead actors should actively develop trans-regional collaboration—even with local differences, shared challenges often lead to transferable solutions as there is a wealth of existing good practice and learnings. Equally new insights and solutions can emerge for perspectives on energy systems beyond regional borders.*
8. *An NPA-focused Network/Hub for Place-Based Living Labs for Decarbonization would be beneficial* to cohere a network and community of practice for transdisciplinary practices and living labs around the joint ambition and mission for decarbonization. This could accelerate the opportunity and capacity to instrumentalize decarbonization living labs for transdisciplinary and co-creation practices in the NPA region. It could seek support of leading inter-regional fora and could connect new or existing NEB Chapters, which would support enhanced partnerships with arts, culture and creativity for citizen and community engagement. The hub could support policy and funding dialogue with other Policy and Funding Instruments including NEB, JRC Regional Innovation - Policy and regulatory innovation and experimentation

Appendix I – Region by Region Summary View

Across the HYBES interventions all regions have delivered engagement and interventions at macro, meso and micro levels engaging over 1300 people in projects and activities. Beyond traditional energy sector players have engaged peripheral communities, youth, indigenous groups, community organisations, housing bodies, residents, artists, multi-disciplinary researchers, local businesses and wider policy makers.

The living lab model evolved alongside pilots and other project deliverables. The model therefore provides a lens to see the holistic view of exploring, experimenting and activating learnings and capacity for stakeholder engagement through diverse methods in real life-settings. In practice, partners explored how living lab approaches could contribute to their local contexts, whilst also delivering a hybrid mix of projects and stakeholder engagements that were driven by this (meso) project level activity rather than from the holistic view of an operationalised living lab. Given this approach and the breadth of activities and modalities of stakeholder engagement across HYBES, many stakeholders engaged in activities without an explicit awareness of the living lab concept and model being evolved. It therefore proved a challenge for partners to undertake a single format to engage all stakeholders in feedback to the living lab model.

As the emphasis here is on impact and lead actors and stakeholders activating an enabler-driven model, regions were invited to hold local meetings with the key partners they felt most relevant and with the purpose of (a) a final reflective evaluation and learnings based on the holistic view of the living lab and HYBES projects activities and (b) to consider the legacy and potential to sustain and take forward the work, both in terms of the impact of their challenge areas and in terms of the engagements and collaborations.

The regions overviews provide a region by region final snapshot view showing the place-based focus and activities and stakeholder engagements delivered in each region. It draws from project deliverables, incorporates feedback and reflection gathered from lead actors and partners, and highlights a high-level local view of the collaborations, engagement, partnerships in that region. Partners have activated boundary spanning work and tested and piloted a range of interventions in their local contexts. Each of the partners have successfully realised core principles of living lab approaches through mobilising collaborative work, multi-level engagement and co-creating solutions in real world contexts and have demonstrably impacted positively in their regions through their interventions.



Cork – Building a County Wide approach for Decarbonisation in Town Regeneration

The key challenge in the Cork context was one of fragmentation and silos for engaging communities at town level across the region. This includes the town appointed as a decarbonisation zone by national policy. Efforts were focussed on building capacity and integration across the system to support town level transitions. Cork focussed on interventions to deepen policy integration, educational collaborations, relational governance capacity and knowledge and know-how for living lab approaches. Activities sought to build potential of education engagement, arts for engagement, to connect citizens with existing programmes. It sought to strengthen region-wide strategy for engagement on decarbonisation and evolve a sustainable mechanism to embed a living lab approach.

Policy Innovation: A key output from the work is the realisation of policy innovation through a new municipal-university partnership focussed on realising a county-wide Decarbonisation Living Lab working with Town Regeneration planning. This will be championed by UCC Research Culture, Engagement and Impact office and the municipal EU Projects Office and Town Regeneration Office. As two anchor institutions, the partnership creates a platform for sustained efforts to mobilise an open innovation eco-system and mission-oriented approach to decarbonisation in the county. Building on the legacy of HYBES, a foundational pillar of this new sustained partnership will look to pilot co-creation workshops to support community engagement and place-making as part of the roll out of Town Regeneration Planning, emphasising the transition to decarbonisation within context of Town Plans. This provides a coherent and value add intervention within the existing eco-system, with national policy relevance for town planning and decarbonisation zones. The partnership for a Cork Region Decarbonisation Living Lab will strategically advance the ambition to build and sustain a best practice living lab, leveraging organisational strengths and opportunities to build capacity, resourced through further engaged research grants and EU funds.

Town Community Climate Action Programme Project Clinics: Cork County Council's Climate Action Support Unit (CASU) led in-person project clinics with forty-three community groups across eight towns, to provide support and guidance in the development of project applications for the Community Climate Action Programme (CCAP). This included the



dissemination of information relating to the HYBES project and informed the evolving thinking on sustained community engagement in towns.

Engaged Research Partnerships: Engaged research placements of students with co-creation training, placed in the Town Regeneration Office and EU Projects Office were supported and brokered by HYBES project partners. A series of UCC-municipal meetings evolved the collaborative approach and quadruple helix workshop with artists and community organisations aimed to build evidence and capacity for arts-based methods. Dialogue throughout has been exploring co-creation options, opportunities, existing initiatives and issues, strengths and concerns around community engagement efforts. Considering the potential for arts-based engagement, HYBES partners ran a co-creation workshop with municipality, artists, academic artistic researchers and climate focussed community groups to evolve guidelines for engaging artists in living lab approaches. The workshop results are contributing to research under development, both at PhD and post-doctoral level. Papers and tools are expected to emerge and be presented at academic-practitioner conferences, including through the UNIC European University Alliance, Centre for City Futures. Building on these foundations, the Cork Decarbonisation Living Lab will continue to explore and pilot opportunity for engaged research to support the joint ambition, including a focus on the intersect of arts and climate in the context of the digital twin transition. It will not only seek to harness potential of arts for engagement, but to also leverage artistic research and the innovation spillover effects of Creative and Cultural sectors for decarbonisation ambitions in the region.

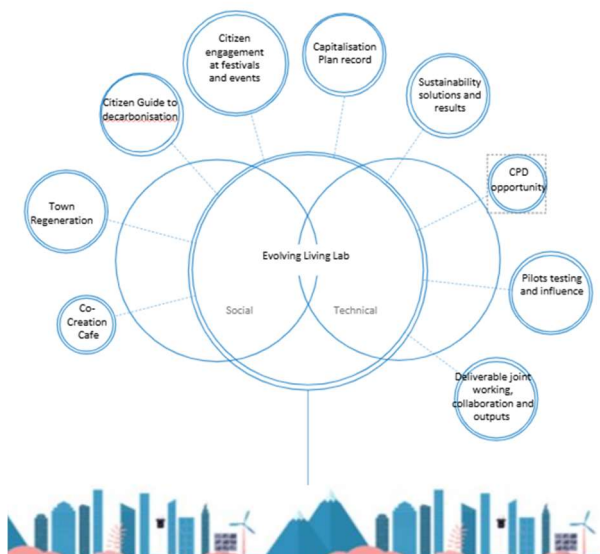
Technical pilots: created new insights for social and community housing solutions such as highlighting that solar efficiency is 50% higher in Cork than in Bodø and in Grímsey, Iceland. Ireland has 500,000 existing homes that is in need of energy upgrading if Ireland is to meet its CO2 emission reduction target. Social and low-income housing requires retrofitting that is not only technically effective, but also affordable to owners and tenants. However solar energy has not been fully explored as a cost-effective alternative to both fossil fuel based and deep retrofit and the main stream deep retrofit based on heatpumps. Pilots like RedWoLF are giving a clear and replicable guideline for energy researchers, developers, authorities and owners as to the potential of solar energy for this purpose. The transregional solar pilots demonstrate that not only is it cost efficient to use solar as energy and it is profitable compared to investment cost, but additionally as energy cost is much higher in



Ireland than in Norway and Iceland it's even more profitable in Cork for quicker return on investment.

Education and Awareness: Skills, education and awareness to support decarbonisation was a key interest in Cork. The legacy living lab will seek to capitalise on the development of the HYBES work and learnings and strengthen integrated approaches across silos to address the learning that community-led efforts face challenges in navigating supports and sharing good practice. The new CPD offering for municipalities 'Climate Crisis and Local Government' is identified as a supporting instrument for public sectors skills. The Carbon Club initiative engaged ten secondary schools in a scalable community-led pilot programme which may be sustained subject to resourcing. Collaborations between partners have explored opportunities for engagement between second and third level and have co-created a joint pilot initiative to link the Carbon Club Programme with third level architecture students. Given the different constraints of partners, this is expected to run in early 2026. This first iteration will aim to build momentum for a sustained collaboration that can leverage third level student engaged learning projects with the community-led Carbon Club programme and so increase its long-term viability for scaling.

The Cork stakeholder feedback was gathered through a meeting with Town Regeneration Office in December 2025 presenting the work of HYBES Living Lab and dialogue, reflecting on the successes of the project and agreeing plans to progress the work and build on HYBES legacy.



Highlights of Stakeholders Engaged:

- 40+ quadruple helix stakeholders engaged over two workshops
- 43 community organisations engaged across eight town climate action clinics
- 10 post-primary schools and third level staff engaged in Carbon Club pilot and third level
- Cross departmental/agency working across 10 diverse units responsible for delivering national policy and programmes that engage communities for new Towns-led approach



Bodø – Testing Living Labs Approaches in Major Urban Development and New City District

Bodø conducted living lab activities and stakeholder workshops related to energy and sustainability in the new city district as a key opportunity as well as organisational learning interacting with the Bodø pilots.

Organisational Learning: One of the most important outcomes of HYBES has been organisational learning. Before the project, much of the energy knowledge was concentrated within the municipality's technical building department. Through HYBES, this knowledge has spread across multiple departments and is now actively used in local climate regulations, municipal societal plan, zoning plans for the new city district, collaboration with energy actor on long-term energy development and competence-building within the municipality and external stakeholders.

New City District: The living lab model has been adapted to contribute to specific ongoing and wider engagement work in the municipality. It has been a priority to use the living lab model as a tool to contribute to the longer-term processes in the municipal energy and sustainability planning. The city district is a large urban planning project with high ambitions in multiple dimensions of sustainability, where energy is one of the important dimensions. HYBES was an opportunity to focus on and improve the energy system understanding and planning of the project, as a part of a larger planning process. Many stakeholders have been involved in the planning at different stages, and it was decided to connect the living lab workshops to an important ongoing masterplan study of the new city district – not exclusively about energy. Experience has taught us that many of the key stakeholders are invited to many interesting workshops, and that they need to prioritize strictly the most relevant ones. Efforts were made therefore to tailor the approach to working with the important stakeholders.

Stakeholder Perspectives Informing Activities: Initial activities were part of an ongoing work, and participated with perspectives and knowledge that was used directly in the following work, both by the municipality and the architectural firms working on the project, as well as for other HYBES activities related to energy system perspectives. Quadruple helix engagement was progressed through workshops were tailored for different stakeholders: municipality, professional sectors related to the urban development and one open for all. This design ensured engagement was highly relevant for all the stakeholders, with very open,



constructive and detailed discussions in the municipal workshop, good discussions and important perspective inputs from the private sector workshop (but with less detailed solutions) and a more open and “ideological” workshop with a combination of citizens, public sector, companies and academia after workhours.

Expanding the Toolbox for Stakeholder Engagement: The stakeholder workshop towards the end of the project about results showed clearly the need to be relevant and short to get stakeholders to participate. Relevant energy sector actors, academia and public sector were invited to a shorter workshop in a busy time of the year- It proved hard to get participants to sign up, and at the workshop some also opted out. The workshop was however productive and engaging with presentations of relevant results from the project and good discussions about the results and perspectives on the learnings. The workshop was a good way to present interesting results in an engaging and inclusive way, while also getting valuable input and perspectives from relevant stakeholders.

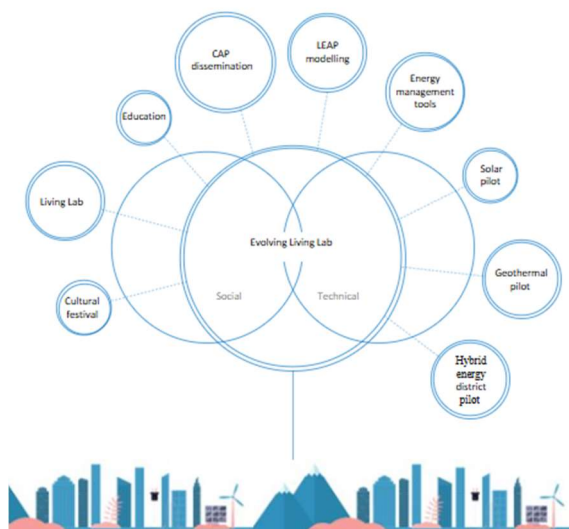
Whilst the living lab has been understood in different ways, such as a longer-term laboratory for active and/or interactive engagement with a topic, or specifically designed for interaction with citizens, in HYBES the citizens were not identified as a key stakeholder in the same way as energy sector and private sector in the context of the stage of urban development and the scale of the project. This has not allowed such full scale living lab, so a focus on relevant stakeholders from private sector was feasible and production to reach with a more directed format and within the timeframe of the project. Living Labs in HYBES in Bodø has therefore been more like structured workshop format with intention to involve a broad range of stakeholders than our initial view of the concept. This format has been successful and has expanded the toolbox for good stakeholder involvement.

Organisational Change and enhanced partnerships: Another useful outcome by such well organised and bidirectional workshop is the construction of closer bonds between the municipality and the stakeholders, which is an important and lasting relationship that improve or worsen depending on the activity amount and quality. This contributes to an important organisational change.

In a larger picture the output from the living labs has participated in increasing the quality of both the HYBES project and the quality of the municipal planning of the new sustainable city district. It has contributed to an improved relationship to the stakeholders, making it easier to involve them in similar activities or one to one meetings or consultations. After the

HYBES project, where the Living Labs have been a good contributor, the relationship to especially some energy sector actors and architectural environments has grown quite strong, with much easier and fruitful communication ways. The methodology used by identifying the stakeholders and their needs and divide the living lab into different parts targeted to the specific stakeholder group gave a very useful learning that will be used in future projects. This is also a good suggestion that can be replicated to other regions.

A takeaway from the Living lab process is that in overall workshops it is easy to discuss challenges, good ideas and larger solutions, but the needs for implementation of good solutions are often very connected to details, processes, and roles. Living lab on an overall level with diverse participant groups can be an efficient tool to get insight in different perspectives and needs/desires on a topic – which in turn is helpful input for the dedicated roles to create the solutions. To get relevant and concrete solutions from a living lab, Bodø's experience is that it is necessary to be very precise on the topic and that there is a higher requirement for detail knowledge among the stakeholders. The division into multiple sessions has been seen as a successful way to meet the right level of detail for the different stakeholder groups. The engagement with schools and Sami artists was a novel approach to reach publics. Stakeholder feedback of the living labs was collected at meeting between leading anchor partner Bodø municipality and Nordland Research Institute, reflecting on the strengths of the methodology and results of the project.



Highlights of Stakeholders Engaged:

- Engagement with 5th grade classes in all schools
- Collaborative approach and engagement with Sami artists and Capital of Culture exhibition
- Quadruple helix stakeholder engagement with 40+ participants
- Engagement with researchers, technical expertise and pilot site stakeholders on technical pilots.



Iceland – Accelerating the Adoption of Solar Energy

The key challenge for Iceland was a whole region approach to mobilise the acceleration the adoption of Solar Energy, and Iceland focussed on piloting multi-level interventions to co-create solutions. Considering Iceland's journey regarding the installation of solar panels was at a complete starting point when the HYBES project began, HYBES has had a considerable impact on the scope and size of the initiative. Activities can be divided into three components, all of which aim to support solar energy production in the country.

1. A Clear Path for PV Integration – Instructions
2. Empowering Future Installers – Education
3. The Solar Grant Program - Pilot

Regulatory Systems – A clear path for PV Integration: The HYBES project fits into Iceland's broader renewable energy goals by addressing bottlenecks in PV adoption, creating structured educational pathways, and clarifying regulatory processes. Through these meetings and collaborations with key players across the energy and education sectors, the Environmental and Energy agency played a leading role in making solar power a viable component of Iceland's renewable energy future.

In October 2024 the Environmental and Energy agency published on their website a set of instructions for the owners of the micro and small-scale power plants. These guidelines cover system design, selection of equipment, contract with the distribution company (distribution system operator), registration with the housing and construction authority (HMS), and data submission to the national Energy Regulatory authority (ROE). A key co-created output of the overall living lab approach therefore was coherence and formulation of guidelines for the connection of solar cells and other small power plants to the distribution system. This has gone on to be incorporated as part of a larger partnership project called Roadmap for Green Infrastructure Construction 2030, whose work will include updated guidelines based on the real-world testing of the first iteration of the guidelines and stakeholder experience and feedback.

Empowering Future Installers – Education and Skills: The realisation of an innovative collaboration and project will see a small Solar Power Plant at the Secondary School built by students. The secondary school will host the solar power plant, allowing students to monitor and build up knowledge in this field. The equipment has been installed and is expected to be put in use in 2026. A grant supported solar cells and a battery system to be



installed in the school. The goal is to make the classrooms energy independent, enabling students to learn directly from a functioning system and to work on various related projects. The solar cells have already been installed, as part of the solar cell project, teachers at the school have set up a sustainable classroom. It is a 100 square meter classroom where all the energy is obtained from solar cells and a small windmill. In addition, a charging bank has been installed. The classroom is connected to an outdoor area with solar panels, a wind turbine, and heat exchangers, with the possibility of further increasing the number of solar panels or wind turbines if needed. This collaborative initiative involves the secondary school, the Vocational, Educational and Training (VET) centre for electricians and local electrical contractor. It is also noted that female students of this secondary school are active in advancing dialogue in support of women in industrial sectors through their engagement with [Félag Fagkvenna- Association of Professional Women](#). This is considered an example of good practice.

The Solar Grant Program - Innovating through Financial Instruments: A new Pilot Solar Cell Grant scheme was successfully run with over 90 applications, 29 grants awards and installations running through to 2026, when a final report will inform next steps. Not only was the scheme successful in engaging citizens in decarbonisation efforts, but also catalysed actions that led to the first domestic solar to get paid for contributing to the grid.

Funding was allocated based on the greatest state and user interest. Priority was given to off-grid properties, users on rural electricity rates, and electrically heated areas. Consequently, funded projects were either off-grid or located in areas where electricity is generated by diesel generators and so reaching peripheral communities. These solar cells help reduce oil consumption and greenhouse gas emissions, aligning with governmental energy policies. Of the 90 applicants, 29 received an approved grant, which makes the total amount of grants 26 million ISK. The competitive grant scheme has successfully incentivized solar adoption, particularly in off-grid and diesel-dependent areas, aligning with national energy transition goals. Anecdotal behavioural insights included that citizens in these peripheral communities were more likely to share free energy with neighbours directly than with neighbours that supply to the grid without being paid and that interest in weather monitoring translated well to interest in domestic solar take up. Challenges for installation following grant awards also highlighted the need for empowering future installers. Combined with the joint learning with Bodø and Cork, the solar energy pilot projects highlights both the opportunities and challenges of implementing renewable energy

solutions in Arctic regions. While direct integration into the electricity grid remains unfeasible, the initiative demonstrates the benefits of local energy consumption, reducing reliance on fossil fuels, lowering emissions, and improving energy security. The project also underscores the importance of hybrid energy solutions, as solar alone cannot meet year-round energy needs in high-latitude environments.

Transnational Cooperation – The cross regions solar pilots conclude that transnational cooperation enables partner countries to learn from one another and avoid duplicating efforts. Developing solutions independently in each country is both time-consuming and inefficient when proven tools and approaches already exist elsewhere. An example of this is the project *Korterið Breyttar ferðavenjur – Orkusetur*, which demonstrates the value of further developing and adapting existing tools so that they can be used and transferred to other countries and regional contexts.

Stakeholder feedback was gathered via (a) workshop with lead actors on the Solar Power Plant at the Secondary School (b) In-house workshop - as during the HYBES project significant organisational change saw two organizations merged. This presented leading actors feedback on HYBES living lab activities/approach(es) and reflected on journey, impact, strategic opportunity and potential for taking forward and (c) a workshop held in October representing the ongoing continuous engagement and legacy for next steps for design of guidelines and taking forward ambitions for PV integration.



Highlights of Stakeholders Engaged:

Icelandic partners have advanced activities through multi-level; multi projects, co-creation participatory methods across the Quadruple Helix.

- 90 residents; 2 educational institutions; Electric Contractor; Utility company; distribution companies; distribution association and franchise distribution providers; national ministry; regulatory authority; housing and construction authority; Green Building



Council, Industry Association, Union of Iceland Municipalities; Ministry of Social Affairs; Road Administration.

Umeå – A Focus on Neighbourhood

Evidence for Public Planning and Policy - Overall the HYBES work in Umeå reflects ongoing sustained relationships between City and University for research informed energy systems, where HYBES sits alongside multiple collaborative projects progressed with the Energy Efficiency Research Group, which includes a Competence Centre on District Heating. Many of these have building-as-lab focus. The HYBES activities contributed to ongoing co-learning in Umeå, which is also a Mission City and has multiple well established good practice and existing stakeholder engagement fora to advance the climate neutral city mission and citizen engagement, including [Umecom](#).

A Focus on Neighbourhoods – At the outset, therefore Umeå focused its stakeholder engagement on a specific neighborhood Ålidhem, to pilot and learn more from local users directly and considering this scale of placemaking and decarbonisation. This aligned to its research being undertaken in this area and related work on Positive Energy Districts which was shared with project partners during in person meetings. The comparative Sustainable Energy Communities approach in Ireland was identified as a space for possible future mutual learning. The stakeholder engagement took a wider view on local residents perspectives. This approach resulted in a new collaboration with housing associations, and the identification of these as a key interface and broker for positively engaging with neighbourhoods. Additionally, good practices for neighbourhood level solutions to engage citizens in decarbonisation efforts that were led and supported by housing associations were identified, such as car, bike and tools pooling. This highlighted the importance of strategic partnerships and collaborations for engaging communities.

Festivals as engagement - Communication with stakeholders and citizens and their participation is a complex challenge, particularly given the existing arrangements in Umeå. Issues were encountered in attracting stakeholders to meetings, due to multiple reasons that include meeting fatigue by stakeholders especially when they feel there is no tangible benefits for them. Similarly, there is a high complexity of both overall sustainability questions and the project. Another key successful strategy for public engagement was however piloted and demonstrated in HYBES participation and collaboration with the Byggåterbruksdagen on 17 May 2025 in Umeå, Sweden. This was a public event attracting



over 500 visitors and demonstrating practical applications of circular construction, material reuse and sustainable building practices. The event functioned as an open, real-life testing and dialogue arena, aligning well with Living Lab principles by bringing together citizens of different backgrounds and gender, practitioners and public organisations in a shared learning environment. Through its presence, HYBES contributed to knowledge exchange, co-creation and awareness-raising around reuse-based solutions in the built environment. This demonstrated another modality of local neighbourhood level engagement, and the focus on building materials for home renovations is also targeted at residential-level interests of citizens and publics. The event illustrated how living lab settings can support behavioural change, stakeholder engagement and the scaling of circular solutions—core objectives within the HYBES project.

Scenario Analysis for Energy Planning – The Umeå university research on scenario analysis in the neighborhood Ålidhem, uses two approaches: the fuel mix approach, which reflects average grid conditions, and the marginal approach, which considers the impact of incremental energy demand on the most likely marginal energy source. The analysis highlights the critical role of methodological choice in shaping the perceived effectiveness of climate mitigation strategies in low-carbon energy production systems. This contributes to ongoing learnings for different approaches when measuring climate impact, municipal targets as well as social capital and citizen behavior interventions. This work is published and importantly points towards the need for energy systems thinking and planning that goes beyond regional borders. This underscore the need for transnational cooperation as demonstrated by HYBES and the importance of Interreg initiatives.

Climate Communication - A key challenge is how to effectively communicate climate mitigation projects to stakeholders. Inspiring good practice climate communication and different approaches to engaging people in climate-related issues is considered important and additional resources and practice were identified: Top Tips for Climate Communication and [10 Scientific Tips for Effective Climate Communication](#) and the Futures Thinking approach of the [Living Lab in Gothenburg](#) that explores what it might be like to live a day in a climate crisis in the year 2050 – testing everyday life, behaviors, and choices under future climate conditions.

Tools and Best Practices – In addition to research activities, Umeå activities focussed also on the identification and sharing of best practices particularly in the dimension of schools engagement and the Co-Creation Café on this theme. They also developed resources on



tools for energy monitoring with a user-led approach considering residents, municipalities and housing bodies, considering the wide range of tools and approaches.

Informing Future Focus – Partners final reflections considered future projects and applications. The inclusion of stakeholders during a whole process approach was considered important to ensure sustained and regular attendance, with periodic feedback. The design of future city districts with a broader perspective on sustainability, social aspects and connecting it to municipal goals and policies was considered. This could include a broad future dialogue about the municipal goals on building, and what is planned to be built in relation to what the common demands are regarding different forms of housing such as apartments, small houses, and collective housing. As a follow-up of HYBES project in Umeå, partners discussed using data from energy declarations in buildings and looking further into potential and obstacles in applying the proposed measures in the declaration. They also discussed using energy data from a small- pilot project in measuring energy efficiency in school kitchens to evaluate and investigate potential in upscaling such projects and communicating the sustainability benefits of such initiatives. The concluding impression is that the HYBES work is important and that many of the ideas and collaborations that have come up during HYBES can be used and refined for future development.

Lead actor feedback was gathered at University-City meeting held at Umeå's city hall in December 2025. The meeting agenda include presentation of the HYBES results in Umeå and followed up by discussion on how to continue post HYBES, on with the work conducted in HYBES, in order to further contribute to Umeå's climate neutral goals.



Highlights of Stakeholders Engaged:

Icelandic partners have advanced activities through multi-level; multi projects, co-creation participatory methods across the Quadruple Helix.

- Local neighbourhood workshops
- Over 500 attended local neighbourhood festival event, delivered in partnership with key local agencies and businesses.
- Research engagement including scientific publication and doctoral student research collaboration.

Faroe Islands – Energy Solutions for

the Faroe Islands

As the energy authority, the Environment Agency wished to progress solutions for the Faroe Islands for the energy transition, and considering the Faroe Islands are lagging behind in the energy transition when compared to both the Nordic countries and the EU. However, in electricity generation, the Faroe Islands have historically, thanks to old hydropower solutions, had a relatively green production, and SEV's goal of 100% green production has been a landmark in Faroese energy policy for the past 10 years. Although electricity generation has doubled in recent years, about half of the electricity is still generated from green energy. The HYBES activities sought to progress engagement with home-owners as well as industry, municipality and other leading institutions relevant to the transition to away from fossil based fuels, particularly considering geothermal, solar and heat pumps technologies. In addition to collaborating on the joint solutions though the HYEBS technical pilots, the Faroese partner focussed on sector engagement through an Energy Fair and close collaboration with key partners and then targeted efforts at homeowners to support the transition away from oil heating.

Varandi Heimur (Sustainable world) October 2024

The HYBES project contributed to the major Energy Fair called 'Varandi Heimur' (Sustainable world) was held 25-26 October 2024 in the 1300m2 large sports and meeting hall at Giljanesi,

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Sandavágur 360, Faroe Islands. The fair included a two days conference and exhibition stands with participation of most companies and institutions relevant in the energy transition of the Faroe Islands. The conference was opened by the mayor of Vága Municipality and during the two days several speakers from relevant companies and institutions gave their view on the energy transition in the Faroe Islands. Also the guest speaker Sebastian H. Mernild, professor in Climate Change at the University of Southern Denmark (SDU) gave his overview of the worlds climate change situation. The Faroese Environment Agency (FEA) was heavily involved in the organisation of the event and had several speakers at the conference, including HYBES partner Bjarti Thomsen presenting with the title 'Kunnu øll hús hava sólorkuverk' (Can all houses have solar power plants). FEA also had a large exhibition stand at the event with the HYBES poster as a central exhibit feature. This provided an opportunity to present the HYBES project and discuss energy issues and solutions with a wide range of stakeholders.

Energy Evenings: Green Energy for Homes

The target audience for the energy evenings was Faroese homeowners who still use oil for heating their home. The purpose of the energy evenings was to provide participants with better skills and confidence to embark on a transition process towards a greener energy solution. The organizers of the evenings were representatives from the energy authority, who described the progress of the energy transition, together with an energy supplier and a financial institution, who offered energy solutions and financing options, respectively.

The Environment Agency explained how well the Faroese climate is suited for heat pump solutions. The discussions broadly covered geothermal and air-to-water heat pumps, which are the most common solutions for private homes. Good experiences with geothermal heat were highlighted. The Environment Agency can document operational experience going back more than 15 years.

An energy supplier had the opportunity to present the specific solutions they offer. The challenge of describing the energy needs of building owners was made very simple by referring to the building owners' monthly heating costs. People usually do not know their energy consumption in litres of oil, but most people know the amount in DKK they pay per month for oil for heating, the translation was provided. Detailed offers were then presented for energy needs corresponding to 8 kW, 12 kW and 16 kW. This was done for both geothermal and air-to-water heat pump solutions.



The final presentation was from the financial institution (a local bank), which explained how investments in the energy transition can be financed. The key figure is the net impact on the monthly disposable income that building owners will experience. Older individuals who owe a maximum of 80% of the value of their property can obtain an energy loan, which is the cheapest non-amortizing loan offered by the financial institutions. Expected savings for average geothermal solution was provided. This can be likened to an extra lifelong, tax-free pension of 1,000 DKK/month, as tax is not calculated on a saving. It should be noted that all energy conversions are financed with the best interest rate offered.

The discussion afterwards: It was interesting that when comparing the net monthly cost of geothermal solutions versus air-to-water heat pumps, the more expensive geothermal solution became the cheaper one. The reason is partly better operation (geothermal has a higher SCOP value, meaning cheaper operation), but a longer lifespan also makes a big difference. Longer lifespan is also significant for the value increase of the property.

Although the debt has not been paid down, it has been *parked*. Economically, the debt should be annually written down by the rate of inflation. Should it happen, perhaps after 20-25 years, that the heat pump in the geothermal system needs to be replaced, this roughly concerns half of the total investment.

Someone asked about the heirs who will take over the debt when older individuals finance the energy transition with a non-amortizing loan. The heirs receive a property with sustainable energy, and besides being good for the environment, green solutions are also cheaper to operate than oil-fired systems. They also gain security against fluctuating oil prices, and the loan they may end up having on the property is subject to a special interest rate discount provided by financial institutions for buildings with a green energy solution. This discount is 0.2% of all debt on the property.

Now that all 7 evenings in the autumn of 2025 are over, all organizing parties agree that the evenings have been very productive, not least because the participants, totalling around 275 and broadly representing 1.5% of all building owners in the Faroe Islands, seemed very satisfied with the evenings. This was evident from the questions asked during the presentations, and especially from the interest shown during the coffee break afterwards. The feedback received afterwards has also been very positive. All parties feel that the evenings have not only sparked interest in the coming energy transition but have also made it clearer for many what the right thing is for them to do.

Demonstrator:

In the village of Leirvík, a new ground source heat pump system was installed next to the local school and elderly home. The system replaced oil burners with a modern solution combining geothermal heat extraction and large-scale thermal storage. A central activity was the development of a data-collection and visualisation system that enables performance data from the heating system to be presented clearly and openly. This system is publicly displayed online, helping residents, decision-makers, and visitors understand how the technology works and how energy flows through the system. The Faroese Environment Agency coordinated the work in close cooperation with local and regional stakeholders including municipality and utility organisation. The Leirvík system demonstrates a practical solution: using surplus wind energy to power heat pumps and store it as heat when available, then releasing it when needed. This approach strengthens energy security, reduces fossil fuel use, and increases the overall efficiency of the energy system. For a village of just 700 inhabitants, the system stands as a concrete example of how renewable energy transitions can be both technically robust and locally meaningful.



Highlights of Stakeholders Engaged:

- 275 citizens engaged in seven green energy for homes energy evenings
- Major Energy Fair
- Local Demonstrator - New ground source heat pump system was installed next to the local school and elderly home replacing oil burners with a modern solution combining geothermal heat extraction and large-scale thermal storage.



Appendix II - Overview Activities and Deliverables

WP 1 - Changing citizen behaviour: Living Lab for Co-Creation and capitalisation for decarbonization.

To facilitate societal impact using citizen-centred and participatory design principles, allowing cocreation of innovative solutions for decarbonisation, and to develop the living lab as a method achieving behavioural change.

The following table includes the project activities and deliverables related to the living lab approach and includes link to each of the project deliverables reports as outputs.

Activity 1.3 Identify and design a Living Lab model to be implemented for activities in the partner regions.
Led by UCC. Activity 1.3 will identify and design a co-creation Living Lab model for evidence-based Open Innovation (OI) that is linked to the UN Sustainable Development Goal's, the objectives of New European Bauhaus and the European Green Deal, and fundamental to understanding decarbonisation strategies. Activities will evolve a co-creation process, based on 'Design Thinking' steps that situates the cultural, societal, environmental, and regulatory contexts impacting decarbonisation. It will also involve an impact-by-design research platform that is based around ideation, co-creation solutions and implementation. This activity is an essential component of the project and will set the overall tone for citizen engagement and capacity building as a means of delivering designated Decarbonisation Zones in rural and peripheral locations across the partner regions.
D.1.3.1 - Living Lab model Report. Provide an evidence informed Living Lab co-creation model in the five partner regions - where society, government, business and academia (quadruple helix) work together to identify environmental opportunities and solve challenges around decarbonisation in the NPA region.
Delivery The HYBES Living Lab model report provides a contextualised, evidence-informed conceptual framework and approach for the HYBES living lab approach to be evolved over the course of the project. It builds on European best practice for living labs and citizen centred participatory design approach and created a high level roadmap to evolve and refine the model over the duration of the project. The report provides the theoretical and methodological underpinning for the approach taken in HYBES. This includes working with a place based approach and across multi-level engagement for socio-technical transitions. The emphasis is placed on tailoring

solutions to specific local contexts, including community-driven measures of change and making decarbonisation a collective effort.

The living lab model report was informed by early activities undertaken by project partners on policy mapping, local context mapping and framing and initial stakeholder mapping to ensure an approach that could be practically applied, relevant and flexible in local contexts, whilst supporting a cohesive approach.

The report also creates the framework for a knowledge based eco-system in HYBES operating and local and transnational level and anchors mutual learning theory as a pedagogical model to be embedded in the project to support this eco-system.

The report established initial core principles and also worked with partner regions to identify early engagement activities needed with strategic partners to advance the local approach.

[Report Available Here.](#)

Activity 1.4 Consultative Stakeholder Workshops

Led by UCC. Using the Living Lab (LL) model and co-design process, Activity 1.4. will conduct and replicate a series of consultative workshops with key regional Quadruple Helix stakeholders across all partner regions. This collaborative inter-regional approach will allow the identification of key applications and specific functions (activities) on which there is apprehension and relative areas of interest which require further consideration. These consultative co-creation roundtables will be based on 'Design-Thinking' steps, focusing on topics that make decarbonisation activities more accessible and effective.

Living Lab Structure:

(A) Understanding and ideating: (i) Engage and Empathize (ii) Frame (iii) Ideate Together

(B) Co-creating solutions: (i) Co-Create

(C) Implementing Creations: (i) Anchor

LL topics include: best practice transfer, social inclusion, skills and knowledge transfer, researcher mobility, access to funding, and; industry/academia engagements and impacts on policy development.

D1.4.1 Five Quadruple Helix (QH) regional stakeholder workshops. Organisation and hosting of five regional stakeholder workshops. These regional workshops will kick-off the Living Labs (LL) model in the partner regions.

D1.4.2 Report on Stakeholder workshops and key recommendations for policy.

Provide a report that captures the learning from the stakeholder workshops, and comparatively synthesises the learnings from all partner regions, as well as provide recommendations for future policy.

Delivery

Partners in each region - Akureyri, Bodø, Cork, Tórshavn, and Umeå - worked to extensively to map out stakeholders and lay the groundwork with early strategic stakeholders for local buy in and support.

Each region chose specific geographic focal points to align their decarbonisation efforts with local strategic opportunities, ensuring that initiatives were relevant and impactful within each area's unique context and optimising opportunities for longer-term goals beyond the project duration. In practice this required local meetings and a discovery phase to ensure the initiatives mitigated risks of duplication of effort, adding complexity to existing end-user engagement activities and infrastructure or worsening relational issues such as stakeholder fatigue and trust.

The emphasis was placed on identifying value add co-creation work and activity within the existing eco-system for organically developing and building capacity for living lab approaches practices rather than trying to impose an additional infrastructure. Sustained living labs are considered to be evolved over a longer period of time, building on the development of trusted relational working across sector and silo boundaries and working adaptively and flexibly with the local eco-system context.

Each partner then held local workshops with quadruple helix stakeholders to develop more comprehensive overview of current decarbonisation efforts and regional arrangements, as well as to hear diverse stakeholder perspectives on the issues and needs related to their focus area.

This enabled partners to test and advance meaningful and responsive work and activities in their local contexts, strengthening the overall value proposition of the HYBES activities. Partners were provided with consultation support, guidance and templates to support the delivery of local workshops, facilitating partners to orient their efforts effectively within their local contexts.

The workshops and initial engagement activities set the stage for understanding existing engagement practices and learning ways to enhance community involvement.

A report for each region created a baseline benchmark on the current state and evolve the approach to multi-level engagement and orchestration for long term change. This created a foundation for evolving learning and practice on the approach to the living lab model results framework.

Initial successful local practices were collected towards developing a Practice Guide catalogue.

Results from this phase also informed the co-design of the Co-Creation Cafes as a model for transnational mutual learning to support the evolution of joint solutions building on existing good practice knowledge and know-how.

Local reports provide a detailed overview of activities and outputs from each region.

The practice experience and workshop insights evolved the living lab principles and a practitioner-focussed approach to gathering reflective practice learnings informed emerging policy recommendations. Key policy recommendations from this work/

[Report and Policy Recommendations Available Here](#)

Activity 1.5 Interactive Engagement Spaces and Co-Creation Cafes

Led by UCC. We will create a collaborative, transnational interactive learning space consisting of 3 virtual Co-creation Cafes. These will be designed and implemented during the project with the intention to exploit them beyond the project life for a permanent support to co-creation processes. The Co-creation Cafes will facilitate ongoing interaction among the HYBES target groups - ensuring gender balance and a diverse mix of citizens of all ages, educational backgrounds. The aim of creating the Co-Creation Cafes is to facilitate experiential learning and a deeper understanding of the benefits of co-creation processes - where the engagement produces new cultural, environmental, societal and regulatory alignments.

D1.5.1 Report on implementation of three Co-Creation Cafes. This will involve a report on the methodology, implementation and feedback arising from the implementation of three Co-Creation Cafes.

Delivery

Report on Implementation of Three Co-Creation Cafes presents the development, implementation, documentation, and dissemination of the HYBES Co-creation Café Framework.

Co-Creation Cafés create an interactive online co-creation space to support stakeholder dialogue, transnational and mutual learning, and the co-exploration of locally embedded energy challenges and opportunities.

Three Co-Creation Cafes were facilitated in May 2025 with practice presentations by contributors from each HYBES partner region and an external best practice energy living lab.

The Café's piloted a framework for mutual learning exercises anchored in a twinning approach. The themes of the Cafés were 1. District Energy Planning, 2. Solar Energy and

3. Education and Circularity. The themes were jointly developed by HYBES partners during an in-person partner co-creation session earlier in 2025, Cafés are framed not only as discrete engagement events but as a core acceleration mechanism with expert contributions from two regions, employing a ‘twinning’ strategy for mutual learning to tackle the challenge that scaling or replication of good practice requires in-depth exchange as solutions are typically site and context specific. The mutual learning approach enables practitioners to deep dive into practical delivery, technical specifications or operational considerations of solution and identify the relevant insights to adapt and adopt innovative practices from other regions or to find common areas where new joint solutions or collaborative efforts could be focussed. The report provides the theoretical underpinning of the approach and documents for dissemination the methodological design and delivery of these first experimental Co-Creation Cafés. It also presents a first iteration of the ambition to evolve the Co-Creation Cafés as a key component of the final model and technical guide. A subsequent co-creation session with partners at the partner meeting in Bodø invited reflective practice, evaluative learnings and feedback from partners to evolve the co-design of the framework for inclusion in the final reports.

Report Available Here

Activity 1.6 Cultural Events and Festivals as platforms for developing decarbonisation awareness

Led by UCC. Using the Living Lab concept and Co-creation Cafe, a strategic objective of this activity is to demonstrate and build awareness towards decarbonisation around cultural events. The project will engage in a minimum of two significant cultural events, creating public platforms that create awareness around low carbon societies. It will work in parallel with these cultural events as means to disseminate carbon neutral benefits to diverse public audiences - while paying particular attention to elucidate the cultural meaning and background of these measures to non-specialist and new audiences. In these ways, the co-creation processes will make use of cultural events as a means to promote decarbonisation - particularly relevant in the context of Bodø being appointed as EU Capital of Culture in 2024, Nova Gorica (2025), and Oulu (2026).

D1.6.1 Reports on Cultural Events and Festivals as platforms for developing decarbonisation awareness. This will contain a report on the methodology, implementation and feedback arising from the implementation of various Cultural Events and Festivals as platforms for decarbonisation awareness.

Delivery

The deliverable D161 outlines a comprehensive overview that demonstrates how arts, cultural events, and festivals can build awareness for decarbonisation through replicability and sustained data collection. This activity engages with three cultural events in Bodø, Cork and Umeå – two of which align with significant cultural events; Bodø as Capital of Culture in 2024 with events rolling into 2025, and Cork as a significant context which celebrates 20 years of the promotion of Irish Arts worldwide by Culture Ireland (Cultúr Éireann). This deliverable focuses on the implementation, documentation and dissemination of these cultural events and festivals as platforms for developing decarbonisation awareness with a central focus on the potential of arts and artistic thinking to accelerate this. The dissemination of this activity emphasises the value of learning communities and cities through modes of co-learning, co-creation and co-design where knowledge is co-created through a bottom-up approach rather than a top-down prescription of knowledge by experts.

The deliverable explores three pilot cultural events and festivals in Bodø, Cork and Umeå, two of which have taken place earlier this year (Bodø in January and February 2025, and Umeå in May 2025) with a third event in Cork in November 2025. In Bodø, the European Capital of Culture 2024 status was leveraged to foreground pedagogy and indigenous knowledge, creating engagement between cultural institutions and schools around Sami arts and culture. In Umeå, emphasis was placed on the necessity of circular economy principles, creating intergenerational engagements and local placemaking across the QH in which mutual learning dynamics are focused on the re-use of building materials. The Cork event focused on engagement between the QH and local artists illustrating arts and artists as intermediaries to cultural activities and events.

Arts, cultural events and festivals are uniquely positioned within the Living Lab Model due to its holistic qualities that draw stakeholders into interaction with one another. This is enacted through embodied and spatial ways intensifying affective, social, and imaginative dimensions of climate innovation which might not be similarly experienced in virtual or typically more formalised living lab environments. In preparing for the Cork event opportunities to collaborate with experts external to the HYBES project were built and relationships between the HYBES Living Lab and practitioners within the arts were formed. The deliverable includes a valuable contribution from Dr Brice Catherin, a post-doc researcher in UCC which will be embedded within the HYBES Guide to Living Labs for Decarbonisation due at the end of delivery period 6. Offering valuable insights into the value and expansive nature of artistic thinking in addressing abstract issues, Brice also contributed to the planning and execution of the Cork event which mobilised artists as mediators for decarbonisation.

The deliverable includes working paper research and early iteration of a framework being developed through PhD research of Jedda Desmond. Her 'Pause-Encounter-Reimagine-repeat' (PERr) framework examining how arts, cultural events and festivals can

theoretically, methodologically and practically contribute positively to transformative change, raising awareness around decarbonisation. Within the deliverable, these Bodø, Cork and Umeå pilots are translated into typologies for replication beyond the scope of the HYBES project. Within the proposed PERr framework, arts, cultural events and festivals are conceptualised as effective place-based decarbonisation ecosystems out of which several thematic lines emerge. These follow an illustrative methodology for data collection, and reflect on how arts, cultural events and festivals contribute to long-term transition pathways through their social, spatial, and creative infrastructures.

During the work on this deliverable practice examples were also collected for the practice catalogue.

This deliverable identifies several key learnings including; the need and opportunity for knowledge resources and guidance for Living Labs and within the Living Lab Model on how to best integrate arts, cultural events and festivals for decarbonisation which will be explored as part of the HYBES Living Lab toolkit; how integrating arts can contribute to diverse knowledge and ways of knowing for Living Labs; provide a particularly strong format for working with citizens, schools and education; capitalise on the relationship between arts, culture, creative businesses and open innovation in the context of a regional research and innovation ecosystem; and acknowledges the value of creative industries and practices are especially relevant for circular economy, materials and built environment for systems change.

Report Available Here

Activity 1.7 Guide to deliver the Living Labs model as a tool for the delivery of behavioural change for decarbonisation in other NPA regions

Led by UCC. Using the Living Labs model devised and implemented in WP2, this activity will develop a guide which will identify Co-Design opportunities for improving energy performance and decarbonisation and will be structured in three parts: MAKING, SEEING, and INFORMING - such that it acts as a Guidance for Future decarbonisation projects across the Partner Regions and the EU. Each part will include a way of looking at project stages called a 'temporal lens' (e.g., looking back, forward, both). Focusing on the factors necessary to facilitate replication, this activity will include analysis of the barriers and enablers to implementation and will provide a critique of the regional disparities and socio-economic factors that influence the success of implementing the Living Labs model as a tool for empowering all citizens to achieve decarbonisation. This guide will describe the inherent value of the project and its activities to the Partners and to different civic and public audiences.

D1.7.1 Technical guide on the Living Labs as a tool for delivering behavioural change for decarbonisation. Evidence-based technical guide on the experience of partners and research expertise.

D1.7.2 Stakeholder report on the effectiveness of the Living Labs model. Evidence-based stakeholder report on the experience of the Living Labs model. A minimum of one workshops will be held in each partner region to gather stakeholder opinion on the Living Labs model.

Delivery

The technical guide on living labs as a tool for delivering behavioural change for decarbonisation is presented as practitioner focussed practical guide and toolkit for other regions wishing to kick-start local living lab approaches.

It brings together the learnings and work of the living lab deliverables, as well as the experience from the project wide to create a step by step process guide to initiating a decarbonisation living lab approach based on the HYBES model.

It evolves iterative work and refines final elements such as guiding principles, multi-level engagement and working across six different dimensions as system lever for change. The technical guide includes a final practice catalogue, bringing together in one place good practice tools and knowledge resources collected by all partners across the duration of HYBES.

It translates activities from each of the living lab deliverables into guidance documents and tools for wide dissemination, application and replication inviting actors in NPA regions to strengthen a community of practice approach to unlock the wider opportunity for living labs as an instrument for decarbonisation.

This report provides the stakeholder report on the effectiveness of the living lab model and serves as a summative report of activities. It draws on the partners mutual learning, reflective practice evolved during the project considering the project results reviewed as well as stakeholder feedback gathered to provide a summative evaluation of the model and its effectiveness.

Complementing the Technical Guide as a user friendly tool, the report captures insights of evolving and refining the model. It calls out key successes as well as examines what can be learnt from issues and challenges experienced along the way.

The report includes a region-by-region living lab model view of the hybrid activities delivered in each partner region through the this and other work packages. It captures summative data on the multi-level stakeholder engagement, collaboration and co-creation activities delivered within HYBES and takes a temporal lens to consider the living lab approach and model advanced during the project. In particular it identifies key issues and considerations for developing and sustaining living labs beyond the HYBES project.

And makes final forward looking recommendations for exploiting the learnings and results of the work. It advocates progressing place-based living labs for decarbonisation as a movement and community of practice in NPA regions. Key knowledge resources informing the work and are collated and curated in the practice catalogue of the final technical guide.

Guide Available Here

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