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Recommendations for Transition Super-Lab coalitions building, empowering of vulnerable and marginalised groups, and vision process

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Abstract

This deliverable includes status report as well as clear recommendations regarding the building of coalitions, the empowering of vulnerable and marginalised groups and communities, and the vision finding process for the TRANSFORMER Transition Super Labs.

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List of Acronyms

CO_2	Carbon dioxide
DIADYMA	Waste Management of Western Macedonia
ESG	Environmental, social, and corporate governance
EU	European Union
EV	Electric vehicles
GDP	Gross domestic product
H_2	Hydrogen
KGHM	Kombinat Górniczo-Hutniczy Miedzi
KPI	Key Performance Indicator
LGOM	Legnica-Glogow Copper Belt
NGOs	Non-governmental organization
NRW	Nordrhein-Westfalen (North Rhine-Westphalia)
OECD	Organisation for Economic Co-operation and Development
PT	Public transport
PPC	Public Power Corporation
RER	Radiale Ovest, Radiale Est
RES	Renewable Energy Systems
SECAP	Sustainable Energy and Climate Action Plan
SMEs	Small and medium-sized enterprises
SMR	Small Modular Reactors
SUMP	Sustainable Urban Mobility Plan
SWOT	Strengths, Weaknesses, Opportunities, and Threats
T	Task
TG	Target Group
TJTP	Territorial Just Transition Plan
TSL	Transition Super Lab
WM	Western Macedonia
WP	Work Package

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Executive Summary

This deliverable provides insights into the process of creating a vision, building coalitions, and engaging stakeholders within the TRANSFORMER Transition Super Labs (TSLs). It offers explicit recommendations on these topics and provides guidance on how to involve citizens, especially those who are vulnerable or marginalized, and design effective co-creative engagement initiatives.
The deliverable is an outcome of the TRANSFORMER project, which seeks to establish long-term systemic transformation frameworks for European regions to hasten the transition towards climate neutrality. This is accomplished through the creation of TSLs, which are piloted in four distinct regions: the Ruhr Area in Germany, Emilia Romagna in Italy, Lower Silesia in Poland, and Western Macedonia in Greece. Each of these regions has its unique challenges and socio-technical systems that will impact the TSL development, objectives, and stakeholders. Although the TSL concept is still in its conceptualisation phase and has yet to be comprehensively defined, it is widely understood as an ecosystem organised to accelerate climate neutrality through innovation, digitalization and cross sectorial synergies employing Living Lab approaches to address significant systemic challenges with the aim of rapidly and sustainably transforming regional systems.

The deliverable, developed within the Work Package 3 *Super-Lab Development and Pilots*, is structured in the following way: First, the TSL concept is presented, followed by an account of the vision development process. The subsequent chapter outlines the process of coalition building, followed by a chapter on citizen engagement activities undertaken by each TSL. Finally, the deliverable provides a set of recommendations for vision development, coalition building, and citizen engagement activities, with a particular emphasis on inclusion of marginalized groups, as well as tips for designing a co-creative session.
The deliverable is a result of seven months of data collection from engagement activities. To begin with, the TSLs employed a stakeholder mapping exercise and a preliminary analysis for their regions to identify and refine their visions and coalitions. Then, each partner provided additional information through interactive workshops using the *Living Lab Mapping Canvas* and stakeholder mapping methodologies. Ultimately, the recommendations from each TSL were collated and bolstered by both the literature review and a *Co-creation Design Workshop Canvas*, which was specifically created to assist TSLs in their co-creative sessions.

The TSLs began their vision development process before the project start and refined their visions through a digital workshop held at the beginning of the project in October 2022. During the workshop, each TSL prepared a preliminary analysis of the region, re-stated the vision, and elaborated how the vision contributes to achieving climate neutrality. The relevant stakeholders required to implement the vision were identified and mapped by the TSLs. The vision development process continued in February 2023 through discussions and data collection resulting in clearly defined visions and sub-visions.

The TSLs have developed the following visions:

- Emilia Romagna TSL has a three-fold vision, aiming to promote and increase cycle mobility to improve sustainable mobility; improve and spread the mobility management activity in order to reduce traffic congestion and improve the use of electric vehicles; and optimize the

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infrastructure and the use of the electric vehicles charging points in the urban city centres of Emilia-Romagna region.

- Lower Silesia's vision is to develop zero-emission transport in the Copper Valley region.
- Ruhr Area aims to be one the greenest industrial regions in Europe with the use of hydrogen.
- Western Macedonia is striving for diversification of the economy through climate neutral energy production, for which three sub-visions were developed. These are diversification of clean energy (renewable energy sources and hydrogen) and clean mobility; incorporation of green agriculture and circular economy; and the transition of the city of Kozani to a zero-pollution city supported with a new open Living Lab.

The coalition building process was held alongside the vision development process. The TSLs first conducted a brainstorming exercise to identify their quadruple helix stakeholders. The *Living Lab Mapping Canvas* methodology was used to guide the TSLs in mapping out the key components of Living Labs. Through the Canvas it was discovered that identifying and engaging civil society stakeholders presented the greatest challenge. To address this, the TSLs conducted the *interest vs. influence matrix* exercise, categorizing civil society actors based on their level of influence and interest in the project activities. The matrix helps to prioritise stakeholders and ensure that the most important ones are given the necessary attention and resources, and that are then approached with an appropriate communication strategy. The process of coalition building is a continuous activity that will occur throughout the project. Currently, the TSLs have already formed their coalitions and started their stakeholder engagement activities, which will be an ongoing process throughout the duration of the project. The engagement activities achieved to this date are:

- Emilia Romagna organized two participatory workshops, sent out a questionnaire and organized bilateral meetings. The TSL first focused on internal alignment before reaching out to external stakeholders.
- Lower Silesia organized face to face interviews with key stakeholders, including citizens who are directly affected by transport issues, which are the focus of TSL's activities. Initial interviews revealed that the stakeholders have different views. The challenge the TSL faces is to find a way to balance the views of civil society with project needs and the EU vision.
- Ruhr Area began the stakeholder engagement activities with a workshop with local hydrogen networks to align on the action plan. Input from the civil society and other sectors is gathered through the workshops held in January 2023 where the stakeholders are able to express their view.
- Western Macedonia approached their key stakeholders first with individual face to face interviews on the strengths and weaknesses of the region to achieve the goal of climate neutrality, the measures that should be implemented and how the transition challenges/barriers could be removed. The collected input was used as a basis for the first interactive workshop with all the stakeholders.

Upon examination of the coalition building and vision process, several significant challenges were identified in the pursuit for greater effectiveness, inclusivity, and representation. Based on the experience of the four TSL regions, the vision building process can be a challenging exercise that requires careful consideration. It should be an inclusive and interactive process that involves representatives from all societal sectors from the outset. Stakeholders may not be interested in participating in discussions if the value and outputs of a project are unclear, and they may become

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critical if they perceive that their resources and knowledge are being wasted without a clear goal or benefit. Thus, TSLs must communicate clearly and concisely to ensure stakeholders understand the project's purpose and benefits. In addition, the vision building process needs to be dynamic and encourage experimentation, while taking into consideration the regional reality and context of the TSL.

When developing a coalition building strategy, it is important to take into account the variations between cities and sub-regions (i.e., counties or districts) within a region. To achieve stakeholder engagement the TSLs must first conduct a stakeholder mapping exercise, during which all possible stakeholders should be identified through a brainstorming session. Defining the value proposition of each quadruple helix category in relation to the transition to climate neutrality is crucial, and communication should be tailored accordingly. Recommendations for coalition building and stakeholder engagement highlight the importance of implementing a suitable communication strategy. Other suggestions include raising awareness of climate issues and defining incentives beyond financial ones especially when preparing engagement activities for civil society actors. To ensure the inclusion of marginalized groups, TSLs must customize their engagement activities according to the local audience. This involves considering factors such as work schedules, childcare responsibilities, language barriers, and other factors that may discourage their participation.

Finally, the deliverable presents a new methodology aiding the TSLs in the design of the co-creative sessions. The methodology outlines a series of steps to guarantee a productive co-creation process. These steps cover everything from planning a co-creation session to developing a communication strategy and refining the session's outcomes for implementation.

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1 Introduction

The TRANSFORMER project aims to design long-term systemic transformation frameworks for European regions to accelerate the shift towards climate neutrality. This will be done through the development of Transition Super Labs (TSL) which are piloted in four regions: the Ruhr Area in Germany, Emilia Romagna in Italy, Lower Silesia in Poland, and Western Macedonia in Greece, as seen in Figure 1. While the TSL concept is new and evolving, common characteristics include adaptation and application of Living Lab methodologies which are aimed at large-scale systemic solutions for a rapid and sustainable transformation of regions. Each region is faced with a unique set of challenges and socio-technical systems that will impact the TSL development and goals.

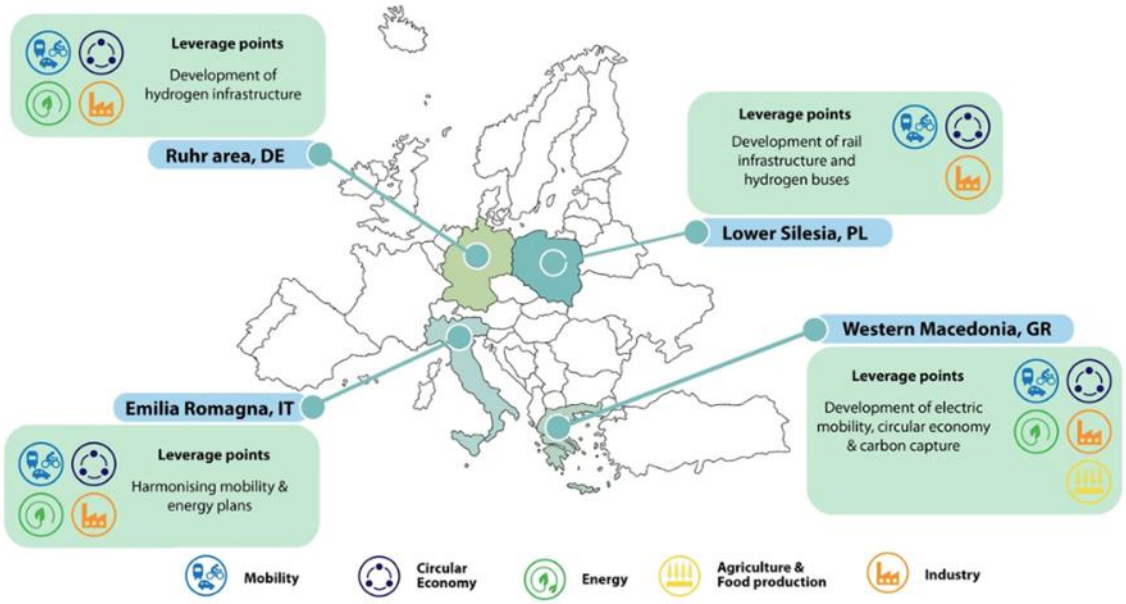

Figure 1 TSL regions

Through the TSL implementation, TRANSFORMER aims to aid the regions in reaching the targets set by the Paris Agreement (United Nations, 2015) and the European Green Deal (European Commission, 2019) to radically transform the economy of the European Union and transition to a carbon neutral economy. Initiatives put in place in the regions to tackle these challenges will be co-designed with the quadruple helix representatives. Through the TSL approach, the four regions aim to achieve the following objectives:

- Objective 1: Develop and implement an effective methodology for initiating and accelerating TSLs as flagship demonstrators for achieving carbon neutrality. This will be achieved through the Living Lab methodology.
- Objective 2: Develop and manage dynamic portfolios of innovative solutions to target and prioritise the transition needs of the project regions with the aim to achieve climate neutrality within 10 to 15 years.
- Objective 3: Secure speedy and agile action in the TSLs by close interaction among different Stakeholders.
- Objective 4: Build the foundation for self-sustaining communities of practice for TSLs in Europe and beyond.

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- Objective 5: Systematically explore and assess the TSL approach on a regional scale with regards to its potential to become a foundation in the Green European transition.

This deliverable is developed within the *WP3 Super-Lab development and pilots* and more specifically *Task 3.1 Enabling coalitions, empowering affected marginalised communities, and developing vision for Super-Labs*. Through this task, the TSLs set-up and maintain an active community of quadruple helix stakeholders which will contribute to the vision development process and support the overall development of the TSLs. The project is committed to include a diverse range of stakeholders; focusing not only on gender inclusion but also inclusion of marginalised groups. These groups are broadly defined as communities affected by the climate change, an/or the planned transition and those stakeholders which are traditionally not included in the participatory processes.

The deliverable presents the concept of Transition Super Labs in comparison to Living Labs in Chapter 2, methodology and approach in Chapter 3, visions of the TSLs in Chapter 4, provides insights in the coalition building process in Chapter 5 and the efforts in engaging the civil society actors in Chapter 6. Chapter 7 outlines recommendations for vision and coalition building and the inclusion of marginalised groups, followed by a conclusion in Chapter 8.

1.1 Contribution of partners

Information gathering activities and analysis have been led by ENoLL in close collaboration with the project coordinating and managing partners Ruhr-Universitaet Bochum (RUB) and Rupprecht Consult (RC) and WP3 and T3.1 lead Business Metropole Ruhr (BMR). ENoLL was responsible for outlining the deliverable contents and gathering the data collected through engagement activities organised both by ENoLL and BMR. Partners working on the development of the Transition Super Labs have provided content for this deliverable. For the purposes of information collection activities, the following partners have been involved:

- BMR has provided support in deliverable preparation and provided information on the Ruhr Area TSL,
- RER & ITL has provided information on the Emilia Romagna TSL,
- Dumni z Lubina in collaboration with UNI WARSAW has provided information on Lower Silesia TSL,
- ANKO and CERTH have provided information on Western Macedonia TSL.

1.2 Relation to other activities

The Task 3.1 under which the deliverable is released is closely related to *Task 3.2 Setting-up Super-Lab uses cases* and *D3.2 Definition of Transition Super-Lab use cases* to be released in May 2023. While D3.1 provides recommendations on the building of coalitions and presents the vision finding process of the TSLs, D3.2 will further elaborate on the use-cases and present an overview of the co-creation processes of the TSLs. As seen in Figure 2 this deliverable is closely connected to the activities of WP2 which maps, defines and categorises Transition Super Labs, WP4 activities on roadmap development, WP5 tasks on evaluation and impact assessment and WP6 actions on stakeholder relationship building and capacity building program development. The training provided through the capacity building

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program feeds into all activities of the TSL development process and has provided guidance for the TSLs on the key topics presented in this deliverable.

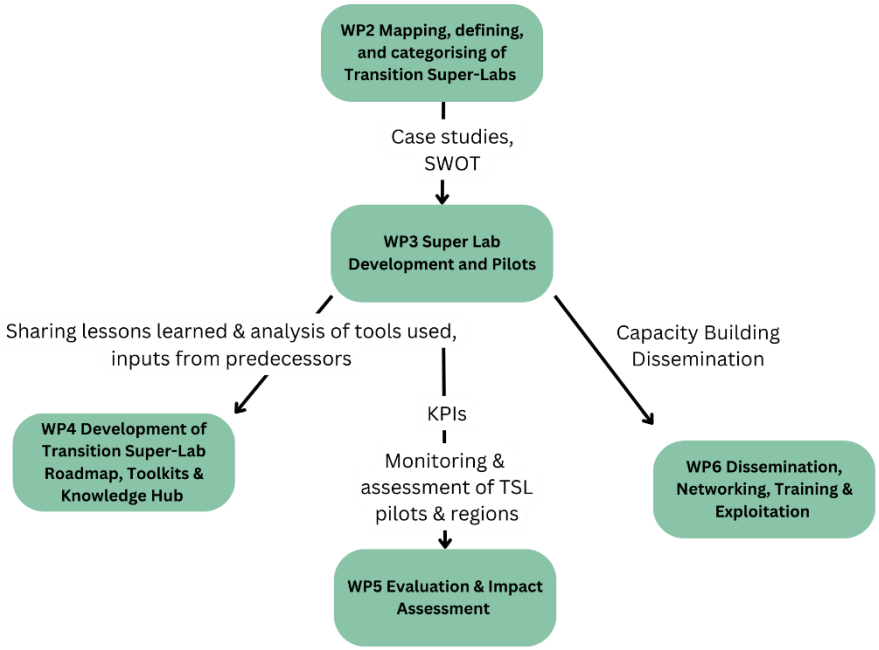

Figure 2 Connection of WP3 to WPs 2,4,5 and 6

Task 3.1 is directly related to the following activities through the following actions:

- Development of qualitative and quantitative transition KPIs by Task 5.1 *Assessment framework for TSLs*,
- Monitoring and assessment of the TSLs pilots and regions of Task 5.2 I*mpact Evaluation of TSLs pilots in regions*,
- Task 2.2 *Case studies for the four TRANSFORMER Super Labs,* which will systematically assess and define marginalised communities addressed in WP3,
- Analysis of the process and development of Super-Lab pilots of Task 4.1 *Development of Transition Super-Lab roadmap blueprint process, as well as Task 4.2 and Task 4.3 which are developing the TSL Toolkit and Knowledge Hub.*

1.3 Target groups

The project has defined three different target groups (TG) that are either directly or indirectly influenced by the project activities and will be engaged. These are:

- Target Group A: Project partners in the four TSL regions,
- Target Group B: Stakeholders in the TSL regions, including marginalised communities,
- Target Group C: Follower regions across Europe. This group is further defined as public authorities, enterprises that invest in renewable energy sources, enterprises active in energy storage market, technology providers enabling climate transition, researchers in the field of sustainable development, policy analysts, ecologists.

This deliverable targets particularly TG A and TG C, while providing recommendations for involvement of TG B.

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2 Transition Super Labs

The Transition Super Lab concept has been first described in the TRANSFORMER *D2.1 Summary of data collection on TSL predecessors* as a new and still evolving concept which is only vaguely outlined. This definition has been expanded following joint workshops by TSL partners. Through the workshops, the TSL is defined as **an ecosystem of actors organized to accelerate the transformation towards climate neutrality through innovation, and cross sectorial synergies on a regional scale.** It benefits from a collaborative governance, operates in accordance with systemic transformation principles and utilizes transition enabling methods and tools in order to create added value to cross-sectorial initiatives for economic transformation and to provide feasible solutions to complex regional transformation challenges.

The TSL approach adapts and applies enriched Living Lab **methodologies** in order to develop (co-create) together with all transition-relevant stakeholders from the quadruple helix and society a vision for a regional transformation and a **portfolio of large-scale systemic solutions** for climate neutrality, net-zero emissions and resilient future. The **systemic transformation** within TSL catalyses large and diverse communities to innovate for systemic changes that accelerate transition at scale.

The **systemic transformation** will be achieved by developing and implementing a portfolio of connected solutions ("e.g., pilot use cases") which engage **multiple leverage points** at the **intersection of socio-technical regimes** simultaneously in order to achieve a rapid and more efficient transformation. Therefore, the adaptation of Living Lab methodologies to a large-scale and with a focus on systemic transformation can be regarded as the core characteristics of a TSL process (see Figure 3):

1. Adaptation and application of enriched Living Lab methodologies (co-creation, experimentation and evaluation)
2. Aiming at large-scale systemic solutions for a rapid sustainable transformation
3. Applying a portfolio approach of measures (experiments) and using multiple leverage points for systemic change simultaneously

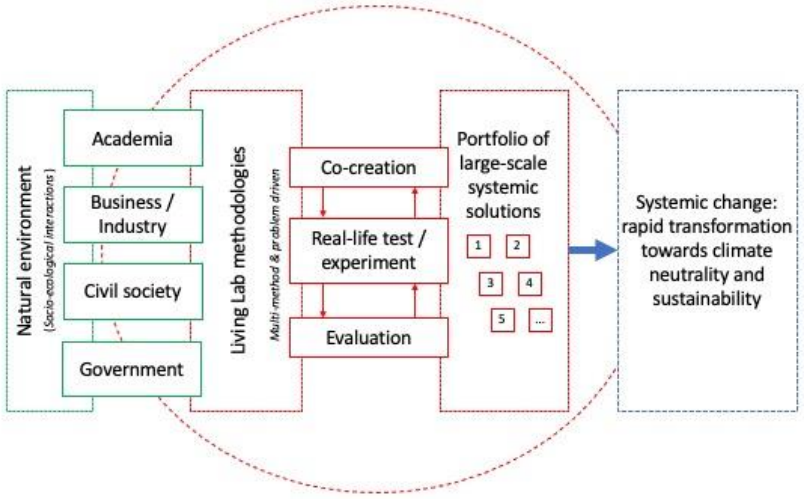

Figure 3 Elements of a Transition Super Lab as designed for D2.1 Summary of data collection for TSL predecessors

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2.1 Comparison of Living Labs and Transition Super Labs

Living Labs are defined by the European Network of Living Labs as "open innovation ecosystems in real-life environments using iterative feedback processes throughout a lifecycle approach of an innovation to create sustainable impact. They focus on co-creation, rapid prototyping & testing and scaling-up innovations & businesses, providing (different types of) joint-value to the involved stakeholders" (ENoLL, n.d.). The definition continues that "living labs operate as intermediaries or orchestrators among citizens, research organisations, companies and government agencies/levels" (ibid, n.d.). And finally, it is emphasized that while living labs have common characteristics there are different implementations of the concept. Key components of Living Labs are active user involvement, co-creation, real life setting in which the living lab operates, multi stakeholder participation, multi method approach and orchestration. Keith and Headlam (2017) added that Living Lab projects could emerge from any sector and are thematic in scope and active in any spatial scale.

According to their definitions, Living Labs and TSLs exhibit three key differences. These are scope and focus, terminology and approach and objectives. With regards to scope and focus, in the TRANSFORMER project we regard the regional level as most useful and feasible for trans sectorial transformation. While the TSLs operate on a regional scale and focus on regional transformation challenges there can be cross-regional and cross border cooperation. Conversely, the Living Lab definition doesn't limit the scope of the Living Lab, but rather presents a Living Lab as an intermediary operating in a real-life environment. The terminology and approach also differ in that the TSL definition describes collaborative governance, systemic transformation principles, and transition-enabling methods and tools to catalyze large and diverse communities for systemic changes. The TSL definition highlights collaborative governance with the goal of including all relevant stakeholders from the quadruple helix for creating political legitimacy and acceptance for long-term and fundamental systemic change, as described in D2.1. In comparison, the Living Lab definition highlights, iterative feedback processes, a lifecycle approach, and different implementations of the concept. Finally, the objective of the TSL is to create added value to cross-sectorial initiatives for social and economic transformation and provide feasible solutions to complex regional transformation challenges, with a focus on climate neutrality and sustainability. On the other hand, a Living Lab definition emphasizes creating sustainable impact and providing joint value to the involved stakeholders, without specifying particular objectives related to climate neutrality or sustainability.

Overall, the Transition Super Lab definition focuses on a specific type of ecosystem, which has a clear emphasis on regional transformation towards climate neutrality, whereas Living Lab definition provides a broader term presenting open innovation ecosystems operating as intermediaries among various stakeholders.

2.2 Definition of the TSL coalition building process and terminology

This section presents the overview of the TSL coalition building process that will guide the project partners, along with introducing key terminology used in the project and in this deliverable. To achieve a paradigm shift a TSL should follow an integrated process that goes beyond the implementation of an action plan and will be described in detail in WP4, during Knowledge Hub activities.

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The TSL coalition building process unfolds as follows:

1. Defining the challenge (the most important 'topic') in the region.
2. Identifying stakeholders based on the challenge.
3. Collaborating with stakeholders to establish the vision.
4. Engaging stakeholders in discussions to explore potential pathways and scenarios for realizing the vision.
5. Identifying suitable pilot projects to test the achievement of the vision and objectives.
6. Reaching a decision with stakeholders on the chosen pathway and deciding on further TSL steps that might again affect the coalition building process.
7. Defining SMART objectives, including clear targets and key performance indicators (KPIs).
8. Collaborating with stakeholders to define and prioritize measures necessary for attaining the vision.
9. Assigning costs, responsibilities, timelines, and financial planning to each measure.
10. Preparing a roadmap to guide the implementation of the action plan.

Vision

A common definition of a vision has been prepared by the TSL partners in May 2023. It has been agreed that a vision for Transition Super-Labs is an ideal representation for the future of the region that captures a common understanding of the desirable and transformative direction towards a sustainable society . Vision development is an essential element of the TSL process. It is crucial for achieving long-term transformation because it provides a clear set of goals, direction and alignment and collaboration among the key stakeholders.

Coalition building

A coalition is a temporary alliance or partnering of groups in order to achieve a common purpose or to engage in joint activity. Coalition building is seen as the process by which parties (individuals, organizations, or nations) come together to form a coalition. Forming coalitions with other groups of similar values, interests, and goals allows members to combine their resources and become more powerful than when they each acted alone (Spangler, 2003). In the TRANSFORMER project, coalition building is defined as the process of identifying and engaging the quadruple helix stakeholders for the purposes of the co-creation activities. These stakeholders are from the public sector, private sector, academia and civil society. Based on the thematic focus of the vision and the pilot use cases, each TSL possesses a unique roster of key stakeholders. These stakeholders comprise individuals or groups who either exhibit interest in the project's activities or are likely to be affected by them. Participation of stakeholders in the TSL engagement activities is voluntary.

Scenarios and Pathways

A scenario can be defined as a structured framework comprising various feasible pathways aimed at achieving an envisioned vision. It involves considering different possibilities and assessing the potential pathways to determine the most suitable approach. Pathways are specific routes of actions taken to reach the vision with a structured approach. These are defined before the pilot use cases. In the TRANSFORMER project, our primary focus has been on the development of pathways. In the WP4

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roadmapping activities, we will delve deeper into exploring and discussing the terminology of scenarios.

Pilot use case

Pilot use cases are identified as co-created concrete project ideas to achieve climate neutrality and promote systemic transformation. Pilot use cases are developed and implemented with a focus on a regional transformation.

Action Plan

An action plan is a document that lists various measures necessary to realize the vision set by the TSLs. It constitutes a concrete plan formulated by the TSLs team, providing direction for the comprehensive set of tasks that must be completed.

The process of coalition building, vision development, pilot use case definition and action plan in relation to the projects tasks in which these are implemented and deliverables where they are reported is seen in Figure 4.

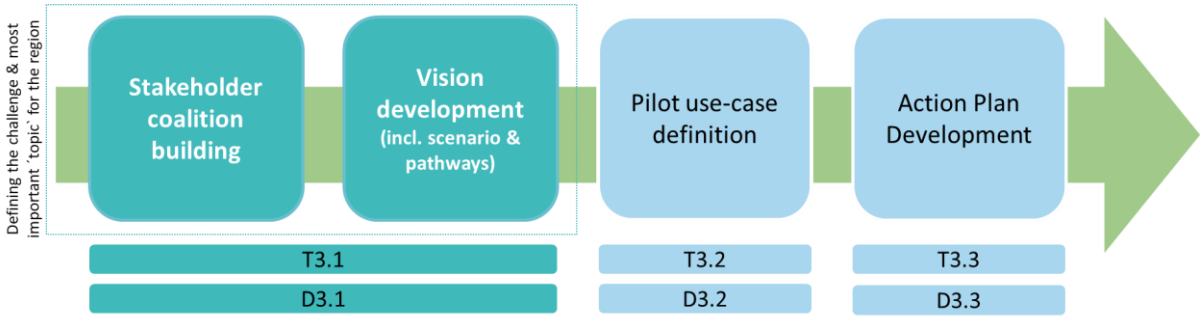

Figure 4 Major steps of TSL process currently implemented

2.3 Main Challenges for implementing a TSL

Given that the TSL concept is still in a piloting phase, the regions are continuously encountering novel challenges as the project progresses. In comparison to a Living Lab, the TSLs encounter a higher level of complexity in managing intricate relationships at the regional level. D2.1 outlines some of the possible challenges faced by the TSLs. These are:

1. *Ensuring a balanced representation of different societal groups and enabling all stakeholders to participate in a TSL*
2. *Ensuring that stakeholders are motivated to participate over the long time of a systemic transformation, lasting several years or even decades*
3. *Integrating existing economic and political networks in a TSL without creating an imbalance of political and economic forces, thus preventing an inclusive transformation process*
4. *Dealing with individual interests and conflicting ideas among the stakeholders*
5. *Creating a common vision for a transformation on a regional scale among the variety of different stakeholders*

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6. *Implementing suitable governance arrangements for a TSL, operating on different levels of government (local, regional, national) but not necessarily within the boundaries of a specific political and administrative unit*
7. *Identifying, implementing and managing necessary steps and iterative loops in the TSL process.*
8. *Assessing and measuring the effects and effectiveness of multiple connected measures on complex socio-technical regimes.*

3 Methodology and Approach

The methodology and approach of this deliverable have been defined on the basis of the identified challenges, which essentially consist of developing a clear vision to effectively engage relevant stakeholders, including civil society. Therefore, the deliverable focuses on four main topics:

1. Vision development process of the TSLs,
2. Coalition building process,
3. Citizen engagement activities,
4. Recommendations for vision development, coalition building, citizen engagement activities with a focus on marginalised groups and tips on designing a co-creative session.

1. Vision development process of the TSLs

Vision development process is important for the regions in order to create a sense of purpose and direction and for aligning efforts of internal stakeholders towards a common goal. The vision development process began before the project started and has been first described in the proposal development phase. To refine the visions, the TSLs participated in a digital workshop in October 2022, organised by RUB and BMR. During the workshop, each TSL prepared an initial analysis of the region with regard to the transformation towards climate neutrality, re-stated the vision based on the information included in the Grant Agreement and elaborated on how the vision contributes to achieving the goal of climate neutrality. The outcomes of this exercise are presented in ANNEX 5-8. Finally, the TSLs defined if any aspects of the vision need to be amended. Next, the TSLs mapped the stakeholders that are relevant to implementing the vision. The vision development process continued in March 2023 through discussions and data collection processes.

2. Coalition building process

While conducting the vision development process exercises, the data collection process for coalition building and quadruple helix engagement was carried out. After receiving recommendations and training, the TSLs began building their coalitions internally.

3. Citizen engagement activities

Two digital trainings focused on stakeholder engagement activities; the first was held in December 2022 and the second which included a hands-on component was held in February 2023. Through these training, the TSLs gained further insight into various techniques and methods for engagement.

4. Recommendations for vision development, coalition building, citizen engagement activities with a focus on marginalised groups and tips on designing a co-creative session

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This chapter was developed through the review of existing practices, the available literature and the knowledge gained during the TSLs activities. BMR has developed recommendations for the vision development process, based on the lessons learned in the project. Recommendations for citizen engagement were drawn from the OECD recommendations on citizen participation enriched with insights gained from TSLs and previous experiences in projects with a strong component of co-creation, namely UNaLab. In addition, recommendations for the engagement of marginalised groups were drawn from the analysis of research papers developed by the Living Lab researchers from the ENoLL community and the projects TInnGO (GA. 824349) and INCLUSION (GA. 770115). And finally, tips on designing a co-creative session were developed specifically for the Transformer project after analysing the needs of the TSLs and the support needed for their engagement activities.

3.1 Living Lab Mapping Canvas

The Living Lab mapping canvas is a methodology under the copyright of ENoLL, adapted for the TRANSFORMER project needs. The canvas is a tool on a Miro board application that supports effective digital collaboration. It was designed to guide organizations through key components of Living Labs, which were drawn from the EU-funded project UNaLab (GA. 730052) and the *Living Lab Handbook for Urban Living Labs Developing Nature-Based Solutions* (Habibipour, 2019), and further elaborated and customized. Within TRANSFORMER, the canvas was expanded to include guiding points for the TSLs which were defined by RUB and RC.

The canvas shown in Figure 5 is divided into three sections:

- Coloured yellow are the areas that need to be defined internally by the TSL teams,
- Coloured purple are the areas that need to be defined with stakeholders,
- Coloured blue are the supporting quadrants.

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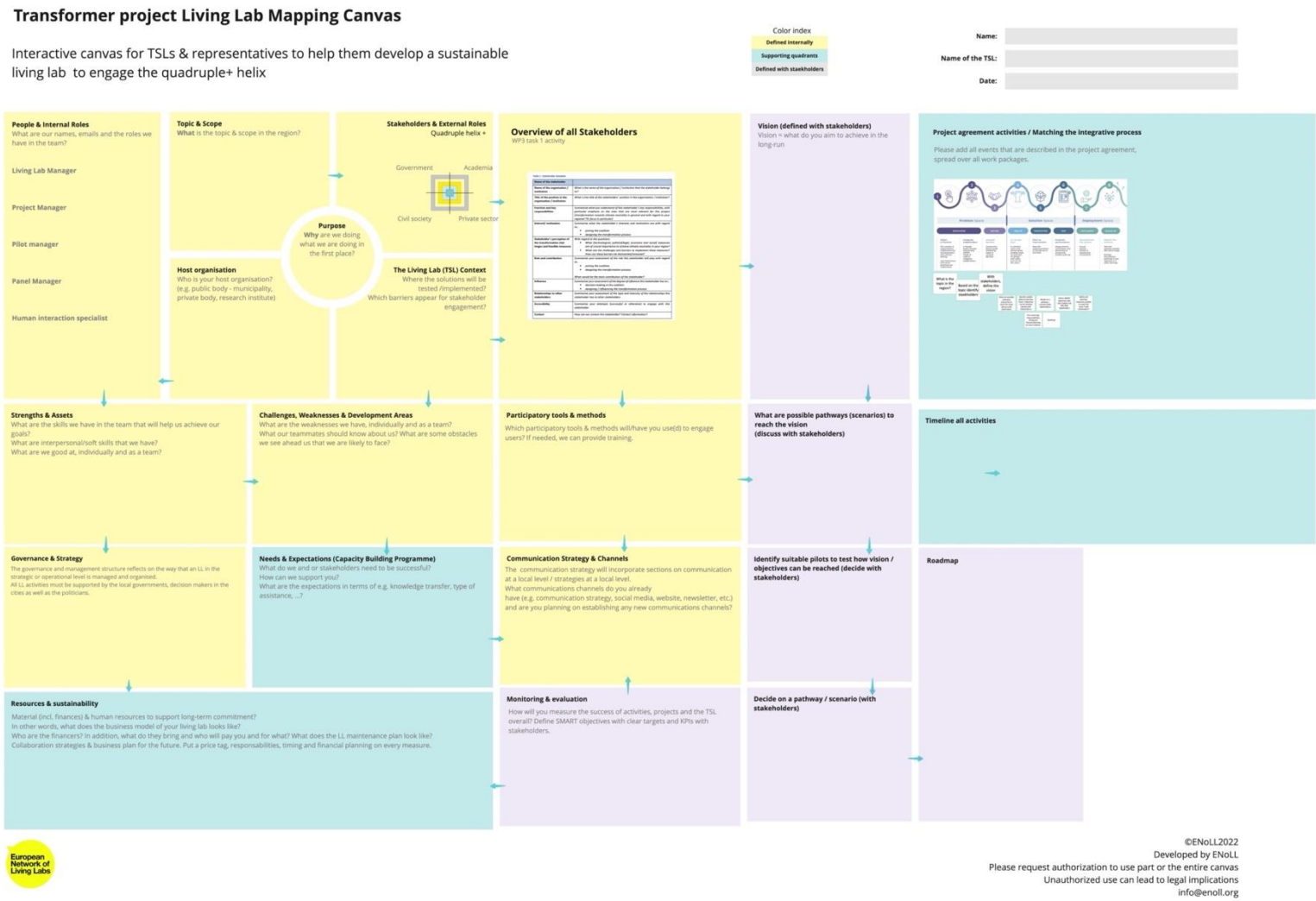

Figure 5 Living Lab Mapping Canvas

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The yellow areas unveil the operational and strategic levels of a TSL. These provide insight into the TSL development and related to different project activities: coalition building (WP3), development of a knowledge hub and the roadmap (WP4), and inputs for training needs and communication of TSL activities (WP6). The yellow area includes the following quadrants:

- The exercise begins at the centre of the canvas, where the TSLs need to note down their purpose, topic, and scope. These elements are essential in later defining the governance structure of the TSL, as well as defining engagement activities.
- Next the TSLs are asked to define their host organisation. Usually, this is the organisation providing resources to the TSL, such as include funding and personnel. The host organisation is also crucial in defining the governance model and sustainability of the TSL. Since this is a pilot project, we can expect the structures to change throughout the course of the project.

The Emilia Romagna TSL is hosted jointly by ITL Foundation and Emilia-Romagna Region. ITL is a non-for-profit research institute that contributes to the development and promotion of logistics and transport systems in the Emilia-Romagna Region through research, consultancy, and training. The TSL team is composed of members from both organisations, however their specific roles haven't been fully defined at the time of this deliverable submission.

The Lower Silesia team has no prior experience with the Living Lab methodology but has a well-established position in the region which will help attract stakeholders to the co-creative sessions. The governance structure of the TSL is composed of the public fund of the Lower Silesian voivodeship – DFR, Dumni z Lubina and University of Warsaw, that are all project partners. The TSL hosting responsibilities are shared between and latter and the Living Lab team is composed of personnel from the University of Warsaw, focusing on research-related activities and foundation Dumni z Lubina. The two teams are sharing responsibilities when it comes to planning and implementation of activities of the TSL.

Business Metropole Ruhr (BMR) is the host organisation of the Ruhr Area TSL. The organisation is the economic development agency of the Ruhr Area. It is a public company, a 100 % subsidiary of the Regional Association Ruhr, where all the 53 municipalities of the region are represented. Certain internal roles taken by the BMR staff have already been defined. These are the Project Manager, Pilot Manager and Panel Manager. It has been noted that external support might be needed and that further internal roles will be defined. RUB is one of the key stakeholders of the TSL.

The Western Macedonia TSL is coordinated by ANKO with the support of CERTH. ANKO SA was created by the local authorities, the State, the agricultural cooperatives, and Chambers of Commerce, in order to act as a pioneering scientific organisation for the regional development approach. While this is a first Living Lab experience for ANKO, CERTH through its Thessaloniki Smart Mobility Living Lab, has long experience with the Living Lab methodology and is an ENoLL certified Living Lab. The roles and responsibilities are therefore shared between the two organisations, with ANKO taking the leading role in engaging with the local stakeholders while CERTH is overseeing correct implementation of the Living Lab methodology.

- In the section on stakeholders and external roles, the TSL need to map out their quadruple helix stakeholders. In TRANSFORMER this exercise was already done prior to the canvas

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activity, but as the stakeholders are an essential part of the TSL operations the partners were asked to revise their input.

- In the TSL context, the partners were asked to elaborate on the area where the solutions will be tested and implemented and identify any potential barriers of the context to stakeholder engagement.
- The left-hand side is dedicated to the people working on the TSL. These were presented to the partners in the December 2022 training. The roles include a Living Lab Manager, Project Manager, Pilot Manager, Panel Manager, and a Human Interaction Specialist. Each TSL has to map out their personnel according to the Living Lab roles, if possible. In addition, the strengths & assets and weaknesses & challenges of the team should be added in the bottom quadrants. The quadrant on the strengths includes questions such as: "*What are the skills we have in the team that will help us achieve our goals?*", whereas the quadrant on challenges includes questions such as "*What are some obstacles we see ahead of us that we are likely to face?*".
- Following the internal roles, the governance quadrant is answered next. This quadrant reflects on the governance and management structure and how the TSL is run on an operational and strategic level.
- The final two yellow quadrants refer to the participatory tools and methods that were already used by the partners and their current communications channels and strategy.

The purple areas were added to the canvas to support the partners in identifying different steps undertaken by the TSLs. These quadrants are not only used for the purpose of developing Transition Super Lab pilots and coalition building, but also for the data collection activities within WP2, WP3 and WP4 tasks. The quadrants include the reflections on:

- Vision definition: here it is emphasized that the vision needs to be defined together with the stakeholders.
- Possible pathways and scenarios to reach the vision, first draft. Through the internal discussions, scenarios were identified as different possible pathways to achieve the vision, emphasizing the need to consider them before defining pilot use cases to avoid disregarding alternative approaches. Each TSL discussed the scenarios relevant to their vision. Pilot use cases, on the other hand, were identified as tools to achieve climate neutrality, promote systemic transformation, and be developed and implemented at a regional scale.
- Suitable pilots to test the vision and objectives that can be achieved.
- Final decision on the pathway and scenario and preparation of a roadmap.
- Monitoring and evaluation: here the TSLs are asked to assign targets and KPIs to their objectives that will be assessed within WP5.

And finally, the blue areas drawback to the Introductory Training held within WP6 activities on Capacity Building where the Living Lab integrative process was presented. This area is not meant to be filled in by the TSLs and serves only as an aide in understanding different steps in the TSL development process.

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3.2 Stakeholder Mapping

The stakeholder mapping activity was conducted to identify stakeholders who should either be involved in TSL actions or will be affected by the project, ensuring all relevant stakeholders are taken into consideration and invited to engagement activities, and that the needs of a wide variety of stakeholders are understood. The stakeholder mapping exercise also helps the TSLs develop better communication activities, build relationships in the local environment, manage risks, and ensure greater stakeholder satisfaction.

The stakeholder mapping task consisted of two separate activities:

- Initial quadruple helix stakeholder mapping workshop held in October 2022, where the TSLs mapped representatives of the public and private sector, academia and civil society.
- Refined quadruple helix stakeholder mapping exercise presented in February 2023.

The quadruple helix stakeholder mapping consisted of a simple mapping exercise, where each representative of the quadruple helix was noted. This included names of the organisations and at a later stage contact person. The purpose of this exercise was to ensure alignment to the Living Lab methodology and ensure that the TSLs do not solely concentrate on specific stakeholders from one sector while neglecting others.

4 Vision of TRANSFORMER TSLs

4.1 Emilia Romagna

Emilia-Romagna region is a highly productive region, home to world-famous industrial districts and crossed by many transportation networks. It is one of the wealthiest regions in Italy, with its diversified economy based on agriculture, industry, and services. The region is home to many thriving businesses, particularly in the manufacturing and automotive sectors. This has helped to stimulate economic growth and increase the region's overall prosperity. The existence of deeply rooted economic structures could, however, also represent a key challenge to decarbonisation if stakeholders are not prepared to embrace the transition process.

The Emilia-Romagna regional authority has set an ambitious goal to achieve carbon neutrality by 2050, and it has developed a comprehensive plan to decarbonize its economy and transition towards a more sustainable future. The regional authority's vision is based on three main pillars: energy transition, sustainable mobility, and circular economy.

Regarding energy transition, the region is investing heavily in renewable energy sources such as solar and wind power, with a goal of increasing the share of renewables in its energy mix to 50% by 2030. The regional authority is also promoting energy efficiency measures in buildings and industry to reduce energy consumption and greenhouse gas emissions. In terms of sustainable mobility, the region is working to promote the use of public transportation, bicycles, and electric vehicles, while also investing in the development of charging infrastructure for electric vehicles. The regional authority is also working to reduce emissions from freight transport by promoting intermodal transportation and the use of cleaner fuels such as liquefied natural gas. Finally, the region is

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promoting a circular economy model to reduce waste and increase the reuse and recycling of materials. The regional authority is investing in waste reduction and recycling facilities, and it is working to promote sustainable production and consumption practices. Several regional initiatives, plans, strategies, and policies are already in place to achieve these goals. A Transition Super Lab at the regional level would play an important role in accelerating transition processes by providing a framework for stakeholders from the quadruple helix to develop a systemic approach and promote collaborative initiatives towards the decarbonization of the regions.

Vision development

During the project proposal phase, Emilia-Romagna TSL decided, in collaboration with all project partners, to focus on energy and mobility topics as they have a strong impact on air quality with the objective of integrating and harmonising the existing SUMPs (Sustainable Urban Mobility Plans) and SECAPs (Sustainable Energy and Climate Action Plans). The transport and mobility sector are responsible for very high levels of greenhouse gas emissions and they have a strong impact on air quality. The region's transition to climate neutrality cannot be successful without putting in place strong initiatives towards green and sustainable mobility. Moreover, acting on the mobility sector could enhance significant transformations in other sectors (e.g., the industrial sector as well as the tourism sector).
The vision development process of the TSL resulted in three goals which were developed with regional departments:
1. Promote and increase cycle mobility to improve sustainable mobility
2. Improve and spread the mobility management activity in order to reduce traffic congestion
3. Improve the use of electric vehicles and optimize the infrastructure and the use of the electric vehicles charging points in the urban city centres of Emilia-Romagna region.

All three goals are interlinked in line with the main scope of the region to achieve climate neutrality: promotion and improvement of sustainable mobility (cycling and public transport), mobility management, intramodality (e.g., integrated ticketing) together with the use of electric vehicles towards green mobility.

Pathways to reach the vision

The possible pathways to reach the vision are:
1. Definition of simple and clear indications on cycle mobility, in collaboration with Emilia-Romagna region cartography department, to be included in the tenders/funding opportunities calls that will be issued from 2023 onwards, in order to collect information on the routes that will be created and to start creating a cartography of RER cycle paths;
2. Promotion of mobility coordination management activities to be carried out together with the area mobility managers and company mobility managers, to favour actions and projects concerning sustainable home-work and home-school mobility, also paying attention to problems related to passengers with restricted mobility transport;
3. Creation of a centralized database at the regional level including all data on electric vehicle charging stations.

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4.2 Lower Silesia

The Legnica-Glogow Copper Belt (LGOM) in Lower Silesia region is a major centre of the copper industry in Poland and one of the largest copper and silver ore mining centres in the world. The predominant form of economic activity among LGOM residents is hired labour in plants owned by a Polish multinational corporation KGHM Polska Miedź S.A.. These entities are cooperating with companies in the KGHM Polska Miedź S.A. capital group, investing in particular subzones of the Legnica Special Economic Zone and the public sector.

LGOM region is specifically characterized by:

- Extremely high energy demand (mines, enrichment process, smeltery, transport). KGHM is the second-largest consumer of energy in Poland
- High employment (30,000 people are employed directly or indirectly by the mining sector and some 300,000 economically depend on it)
- Demand for transport services (workforce, natural resources, ready products).

Vision development

LGOM and the Lower Silesia region are oriented towards reducing CO_2 emissions and reaching climate neutrality in 2050. There are several strategies and plans to reach this goal that have been prepared at different levels. Lower Silesia is the first Polish region with an energy strategy. The strategy includes plans at a local level for low emission economy for the cities within LGOM region. These have been prepared in addition to the plan put in place by KGHM of reducing greenhouses gases emissions by 2030 and reaching climate neutrality in 2050.

The vision of the TSL is to implement zero-emission transport in the LGOM region. To achieve the vision, the TSL will focus on transport infrastructure, renewable energy sources and societal acceptance.

Pathways to reach the vision

To overcome the identified challenges in the region, there is a need for further cooperative processes of communication sharing and information exchange between the different stakeholders. The region needs to further harmonise rules, build a cooperative approach between regional departments and design a common and shared list of priorities and activities to reduce greenhouses gases emissions. During the project proposal phase, Lower Silesia TSL decided, in collaboration with the whole Transformer consortium, to focus on energy and transport topics as improvements in these areas are critical for meeting the climate neutrality goals.

Firstly, Lower Silesian TSL team members agreed that a particular feature of the LGOM region is a very high energy demand. However, different perspectives on the energy transition need to be carried out in response to this high energy demand. The modes of transport to be debated will be electrified, which is why the energy issue overlaps so much with transport. For example, almost 60% of the 73 vehicles of the Lower Silesian Railway are already electric, and 10% are hybrid trains. With the accelerating electrification of wheeled vehicles, we see an inextricable link between transport and energy in the Region.

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Secondly, all stakeholders agree that transport exclusion is a pressing problem in the Region. Residents of the smaller municipalities primarily work in the mines or economic zones of the larger cities but have no access to the railways, so they are condemned to private cars or, at best, infrequent bus connections. Creating a new transport network will not only make life easier for residents but also allow the design of low- or zero-emission solutions from scratch to replace private combustion cars.

These two parallel concepts are helping to shape the Region's vision of truly zero-emission transport in the Copper Valley mining region.

The modes of transport will be electrified, which is why the energy issue overlaps so much with the topic of transport. Currently, almost 60% of the 73 vehicles of the Lower Silesian Railway are already electric, and 10% are hybrid trains. With the accelerating electrification of wheeled vehicles, the TSL sees an inextricable link between transport and energy in the region.

4.3 Ruhr Area

The topic of hydrogen (H_2) has recently gained enormous importance not only among experts but also among decision-makers in politics and industry. This is reflected, among other things, by the publication of specific hydrogen strategies and roadmaps in the EU, Germany, and North Rhine-Westphalia with ambitious targets for hydrogen production, infrastructure and application in the various sectors. In addition, significant activities on the corporate side have already been implemented or at least announced. It can be deduced from this that hydrogen - becoming increasingly green - is indispensable for achieving climate neutrality in 2050 in all sectors of industry, transport, energy, and heat. Green hydrogen is a key building block on the road to climate neutrality. It can function as an energy carrier, but also as a storage medium for electricity, as a raw material for industrial processes or even as an emission-free fuel.

The Ruhr Area (located in the Federal State of North Rhine-Westphalia) has decades of experience in the production, distribution and use of hydrogen, especially in the (petro)chemical industry. Germany's longest industrial hydrogen pipeline (240 km) also connects chemical sites in the Ruhr with the Rhineland region. The conversion of this previously emission-laden grey hydrogen to green sources is complemented by a wide range of new production and application possibilities for hydrogen. The steel industry, mobility, generation at former power plant sites and the supply of neighbourhoods are particularly worthy of mention.

Many players - large companies and SMEs as well as research institutes and municipalities - are already active in the field of hydrogen in the above-mentioned areas. Many new players can still be additionally involved in the hydrogen value chain ("hydrogen ecosystem") and network with each other. This concerns both the side of the operators and users of hydrogen technology as well as the manufacturers of plants and systems and the suppliers of components.

The conversion of energy systems and production processes to hydrogen, therefore, requires a large number of investments and innovations along the entire value chain, from the production of hydrogen to transport, storage and application. This transformation, which has already begun, cannot be accomplished by individual players. Therefore, numerous companies (alliances) and regional

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initiatives have set out to bring hydrogen applications to fruition. In the Ruhr Area, in particular, a high density of exciting initiatives and networks has developed.

A special regional feature of the region is that the state government in the Federal State of North Rhine-Westphalia has been conducting a large-scale and multidimensional stakeholder dialogue called the "Ruhr Conference" since 2018. In this multi-stage and complex process, stakeholders from all parts of society were involved and the participation of individuals was also possible. In five different fields of action, 75 project ideas of various types and sizes were developed. One of the fields of action is "Safe energy - healthy environment" and hydrogen is named as a key technology for the region.

Vision development

The vision development process is a summary of numerous discussions that took place over the course of several years before the beginning of the project. These discussions were carried out within working groups as well as within involved dialogues with energy suppliers, among other parties. The resulting vision emerged from a lengthy and inclusive process of collective engagement. It can be summarised as follows: Ruhr Area aims to be one the greenest industrial regions in Europe. The principles of sustainability and resource efficiency are strengths of the Ruhr Area and they will be the strategies against climate change. Hydrogen will be one of the key energies (both in terms of energy sources and energy carriers) of the future in the economy and society. The goal is to transform the infrastructure and industry of the region in an inclusive, collaborative and innovative way so that the use of hydrogen, together with other renewable energies, significantly contributes to climate neutrality.
Several reports on the development of the field of hydrogen in the Ruhr Area, recently commissioned by BMR, confirm that there are different scenarios or transformation paths for the hydrogen market ramp-up. These differ greatly in the various areas of application and time horizons. They range from the "champagne of the energy transition", in which hydrogen is outlined as an expensive energy carrier for special areas, to the near-term substitution of all-natural gas. The prioritisation of different areas of application, such as material use or energy use in the heat market or industry, also plays a decisive role. Currently, however, the market ramp-up is taking concrete shape, as the energy-intensive steel and chemical industries need to decarbonise and move away from natural gas as quickly as possible. This pressure to act has led to the establishment of a hydrogen nucleus, which in the medium term, will also serve as the backbone of the market ramp-up in other areas of application. In terms of the availability of hydrogen, facts are being created in the region, opening up the opportunity to realise further activities in this area economically. The conditions in the Ruhr Area are very good, for example, due to the port triangle of Antwerp, Rotterdam and Duisburg as well as the connection to the GetH_2 pipeline network, so that the first significant hydrogen imports will take place as early as 2024. There is now momentum to create a nucleus of the hydrogen economy for Europe and to outline transformation paths for the energy transition in various areas.

Pathways to reach the vision

As the field of hydrogen comprises many different topics, the TRANSFORMER regional stakeholder workshop on 19 January 2023 started a real bottom-up process where participants could openly articulate their priorities in order to support the vision with concrete ideas. Therefore, a variety of topics were discussed and can be summarised resulting in the following way:

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- Infrastructure development for hydrogen
- Industrial use of hydrogen
- Supply and use of hydrogen in non-industrial contexts (e.g., in residential districts, business sites).

The exercise of deepening the discussion about the region's vision for a TSL to contribute to the goal of climate neutrality was intensified through the identification of potential pilot use cases. Six project ideas could be identified through the discussion. The follow-up exchange with regional stakeholders brought an additional idea for a pilot use case that was included in the list. In total, there are seven project ideas that are considered particularly promising to support the vision:

- The energy supply of the future at industrial and business sites
- Extension of the Rhine-Herne Canal to a "Hydrogen River"
- Hydrogen in the neighbourhood!? Hydrogen as an energy carrier in municipal heat planning
- Innovative digital solutions for the hydrogen market launch (e.g., digital twin, sector coupling, sinks & clusters, consulting tool etc.)
- Smart process heat in industry
- Application-oriented innovative production of hydrogen
- H2 system cockpit: recording and connecting existing hydrogen initiatives to achieve optimal systemic synergy effects.

4.4 Western Macedonia

The region of Western Macedonia has been traditionally linked to the energy sector with the exploitation of non-sustainable and pollutant energy sources. The Region has strong specialisation in lignite mining and power generation, supplying energy for more than 60 years throughout the country, making its economy highly dependent on lignite. Western Macedonia's energy sector was vertically integrated: from lignite mining to power production, with heat further distributed for district heating to 100,000 residents in the largest urban centres. Except for a few private mines and some small hydropower installations, photovoltaic and wind parks, the energy sector of Western Macedonia is dependent on the Public Power Corporation (PPC). Today, PPC's operations of open-cast lignite mining extend across 150 km2, representing 15-20% (at the highest) of the total installed net capacity of the interconnected electric system of Greece. Whether in mining, agriculture, forestry or fishing, Western Macedonia's economy is predominantly dependent on natural resource extraction. Agriculture, forestry and fishing alone make up the largest employment segment, at 21% of the region's total.

The Just Transition Development Programme 2021-2027, co-financed by the Just Transition Fund (JTF) and implemented under the Cohesion Policy, enables regions and people to address the social, employment, economic and environmental impacts of the transition towards the Union's 2030 targets for energy and climate. Greece is the first country to have its Just Transition Fund Programme and plans adopted by the European Commission; thereby raising the transition towards a climate-neutral economy in a fair and sustainable way, into a national priority. The national transition process towards the EU's 2030 targets aimed at the cessation of lignite activity and the phasing out of inefficient and highly polluting autonomous power stations using fuel oil and diesel by 2023, with the exception of

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one (Ptolemaida V, WM), but due to the war in Ukraine and for energy safety reasons all of them will be withdrawn by 2028.

The process of de-lignitisation of the region is in line with the EU & national target for the transition to a climate-neutral economy. As a result of the de-lignitisation National policy for the 2019 base year and the National Energy and Climate Plan issued in 2019, a Just Transition Development Plan (2021 TJTP Territorial Just Transition Plan/ TJTP Western Macedonia) has been developed predefining at some point the vision of the region for ''Diversification of the economy through climate neutral energy production''. This transition entails the cessation and/or limitation of activities and related industries and, due to the importance of lignite extraction and the generation of energy from its incineration for the Region, it has adverse social & economic consequences for the whole region. Thus, the TJTP Western Macedonia introduced priorities and measures to adopt a differentiated mixture of electricity production and foster the transition of the region's economy.

More specifically, the energy transition & climate neutrality are in line with the Priority of Energy efficiency and Clean & Smart Energy of the TJTP Western Macedonia, including (among others) the following topics:

- Increasing self-generation from RES (Green Cities) — Smart Energy Network (SEN) — Energy Communities.
- Installation of heat pumps for heating/cooling and/or RES electricity generation systems, in line with the "REPowerEU" standards.
- Development of long-term (in particular) clean energy storage infrastructure.
- Support the upgrading of electricity grids to increase installed RES capacity.
- Actions to create charging/refuelling points for electro-mobility/clean fuel mobility.
- Support for construction of small biogas plants using livestock, poultry and agricultural residues.

The region's strong academic and business eco-system will lead this transition in which the agri-food sector, mobility and digital innovation will play a crucial role as the backbone of the new economic system. Open discussion with the transition relevant stakeholders covering clean energy topics such as renewables, energy efficiency, smart cities, circular economy, mobility, governance and citizen engagement, started since 2019 when the 1st Balkan Clean Energy Transition Conference took place in Koila village, Kozani. It is considered essential to optimise transition towards green mobility, identify and support green and fair agri-food supply chains and integrate digital solutions to enhance the attractiveness of the region's areas that are under transition.

Vision development

During the proposal phase, Western Macedonia TSL decided to accelerate a fair and inclusive transition focusing on energy and mobility, agriculture/food production and circular economy and drive the innovation in the area, with close collaboration with all relevant stakeholders and emphasis in civil society engagement.

Based on the outcomes of the discussion in October 2022 on vision and coalition building and working on different aspects of Western Macedonia TSL, three sub visions for the region are prioritised:

- Diversification of clean energy (RES and H_2) and clean mobility,

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- Incorporation of green agriculture and circular economy,
- The transition of Kozani to a zero-pollution city supported from a new open Living Lab.

The 3 sub-visions are focused on four priority sectors for Western Macedonia (mobility, circular economy, energy, agriculture & food production). These are aligned with the main objective of the region towards the achievement of climate neutrality facilitated by digitalisation not only vertically in every sector but also following a cross sectoral approach.

Pathways to reach the vision

The possible pathways to reach the vision were initially pre-defined by the TSL Western Macedonia team and discussed and validated with the region's stakeholders in the first workshop that was performed during the coalition building task:

1. Production, storage, and consumption of clean energy in public transport in the region: Development of different facilitation alternative options through decision support tools (e.g., digital twin) on how the production, transfer and consumption of energy could be performed in the most optimal way in PT (facilities locations, energy demand of PT fleet, fleet operational and functional parameters. The alternatives will be developed following the structure of a feasibility study including cost/benefits aspects and creating arguments for the region's ecosystem will be the basis of future tenders/funding opportunities for the integration of the clean energy in the mobility sector.
2. Pilot testing of innovative CO_2 capture and CO_2 emission reduction technologies / processes in a large farm, and link to the circular economy park of DIADYMA. The feasibility study in small scale will enable later the generalisation of the methodology to be replicated in more agri-farms and potentially the development of agri-food partnerships among small farms for the implementation of the new processes/technologies.
3. Creation of a Data space at regional level that will operate as a coherent data and metadata governance mechanism/tool (synchronisation of the data centres of ''big'' players). This data space will enable the region to monitor and analyse important KPIs in different sectors (mobility, energy etc) and operate in parallel as the collaborative basis of cross sectorial synergies within the region enabling the acceleration of the innovation. The stakeholders sharing their data will be able to be benefited by innovative services and methodologies provided by the Transition Super Lab (e.g., methodology of CO_2 capture). This ''win-win'' model will ensure the appropriate data flow ensuring the sustainability of the Data space.

These pathways were the basis for the initial formulation of the pilot use-cases that were discussed with the stakeholders during the 1st stakeholders' workshop in February 2023. The next steps include the final definition of the pilot use-cases and the examination of their feasibility aspects.

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5 Coalition building in TSLs

In the TRANSFORMER project, coalition building is defined as the process of identifying and engaging the quadruple helix stakeholders for the purposes of the co-creation activities. In this chapter, the coalition building process of each TSL is presented, while the next chapter provides recommendations for the TSLs and other organisations for their own coalition building process.

5.1 Coalition building in Emilia Romagna

Emilia-Romagna TSL began the coalition building from an institutional internal level by involving Emilia-Romagna public authority departments. Emilia-Romagna public authority is a complex institution composed of different departments, each one specialised on a specific topic (e.g., public transport and sustainable mobility; energy and green economy; environment; agriculture, etc.). TRANSFORMER project addresses cross-sectoral themes that involve more than one regional department with complex and different dynamics. Therefore, the first step is to establish an internal coordination among all departments on the addressed cross-sectoral topic. Once the region has a clear overview on all funded and implemented projects at institutional level, the other quadruple helix stakeholders' groups will be involved. The timeline of activities in Emilia Romagna region taking place before the start of the project and in the first fifteen months of the project is shown in Figure 6.

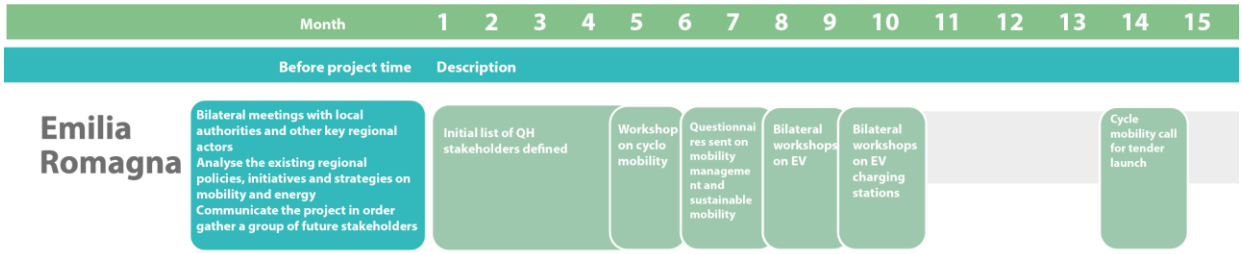

Figure 6 Timeline of engagement activities in Emilia Romagna

Alongside the initial internal alignment process the TSL defined the first quadruple helix stakeholders during the October 2022 workshop, as presented in Table 1.

Table 1 First stakeholder mapping of Emilia Romagna

Type of stakeholder	Stakeholder name	Relevant influence / interest
Private sector – business / industry	CONFINDUSTRIA Emilia-Romagna (the main organization at regional level representing industrial companies in Emilia-Romagna) https://www.confind.emr.it/en/who-we-are-what-we-do	Support in the harmonization of the regional plans and contribute to their implementation
	Regional freight villages and Ravenna Port Authority	Implementation of the activities

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	CONFCOMMERCIO Emilia-Romagna (the most important association of Commerce, Tourism and Services in the region) https://www.confcommercio-er.it/	Coordination between enterprises and policy makers in the energy sector
	UNIONCAMERE Emilia-Romagna (The Regional Union of Chambers of Commerce of Emilia-Romagna). It is the association of the Chambers of Commerce of the territory. https://www.ucer.camcom.it/	Coordination between enterprises and policy makers in the energy sector
	Hera (multi-utility company that operates in the following fields: waste (management and treatment), water (aqueduct, sewerage, and purification) and energy (distribution and sales of electricity, gas and energy services), but we also offer public lighting and telecommunications, always following a business model that focuses on creating shared value for all our stakeholders. https://www.gruppohera.it/	Public/Private utilities working in waste management and energy
	Iren (multi-utility company that operates in the following business areas: electricity (production, distribution and sale), district heating (production, distribution and sale), gas (distribution and sale), integrated water service management, environmental services (waste collection and disposal), integrated solutions for energy efficiency of public and private bodies and services for the local authorities. https://www.gruppoiren.it/	Public/Private utilities working in waste management and energy
	Electric Vehicles Charging and infrastructure companies operating in Emilia-Romagna (Iren Mercato SpA, Enermia srl, Hera Comm SpA, BE Charge srl, Enel X Mobility srl)	Private companies operating in the electrical vehicles sector. They can implement the activities by building the infrastructures and promoting the usage of electric vehicles
Green Civil Society	Legambiente Emilia-Romagna (Legambiente is the most prominent and widespread environmental association in Italy. The main headquarters are in Rome and Milan. In Emilia-Romagna there is one of the 20 regional coordination offices. https://www.legambiente.emiliaromagna.it/associazione/	Ecology association
	Salvaiciclisti Bologna (association of urban cyclists that promotes a city where where the most vulnerable road users, who every day choose sustainable mobility, are	Sustainable mobility association

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	protected, encouraged and valued. https://salvaiciclisti.bologna.it/	
	Cluster GreenTECH (association of public and private bodies: companies, research centres and training institutions that share skills) https://greentech.clust-er.it/en/	Support to innovation of project solutions and results
	FIAB (Federazione Italiana Ambiente e Bicicletta: Italian Federation Environment and Bicycle. It is an environmental organization that promotes the daily use of the bicycle and cycle tourism to protect the environment and fight the climate crisis) https://fiabitalia.it/	Support in the promotion of the use of bicycle and cycle tourism in order to protect the environment.
	Hub del Territorio (association that brings together companies, universities, research centers, local authorities, associations, foundations and citizens united by the same values and eager to create a new perspective of revival and development of the territory according to sustainable, innovative and supportive models) https://www.hubdelterritorio.com/	Support in the creation of a new perspective of revival and development of the territory according to sustainable, innovative and supportive models
Academia	Almacube (start-up incubator University of Bologna) https://www.almacube.com/	Support planning and implementation actions with innovative enterprises
	University of Bologna (UNIBO) and University of Modena and Reggio Emilia (UNIMORE)	Involvement of students and researchers
	ITS (Istituti Tecnici Superiori) highly specialising two-year post-diploma courses	Involvement of young generation post diploma in the following fields: transport, logistics, circular economy, energy, sustainable and smart mobility
	IFTS (Istruzione e Formazione Tecnica Superiore), a one-year specialization course post-diploma	Involvement of young generation post diploma in the following fields: transport, logistics, circular economy,

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		energy, sustainable and smart mobility
Public sector - Government	UPI (Unione Province Italiane: is the Association that represents all Italian provinces. It carries out tasks of technical and political support, enhancement and promotion of the provinces and promotes the protection of local authorities with the Government and Parliament, the economic and social forces, the media) https://www.provinceditalia.it/	Representing the Italian provinces
	Emilia-Romagna Municipalities	Promotion of sustainable mobility through the implementation of several institutional initiatives financed by regional and national funds, in particular through the professional figure of the Area Mobility Manager
	Local Agencies: - Environmental agency (Regional Environmental Protection Agency - ARPA) - Mobility agencies in cities - Energy and Sustainable Development Agency Modena	Support to innovation of project solutions and results
	Supervisor to studies	Local ministry office, deputy for enacting education programmes

The stakeholder list has been expanded to include 70 stakeholders representing the full quadruple helix and was presented in February 2023. The list is seen in Annex 1.

The TSL identified difficulties in organising a workshop with the presence of all quadruple helix stakeholders. Instead, it opted to organize dedicated workshops with specific groups of stakeholders on a particular topic.

In the case of the first vision/pathway workshop held on 24th January 2023, ITL and RER organized a workshop on cycle mobility involving Emilia-Romagna Region Public Authority departments dealing with cycling projects. This workshop was useful to understand the current projects and initiatives implemented by the different departments of Emilia-Romagna Region to develop a clear vision and pathways. After that, specific invitation letters to collaborate including questionnaires on mobility management and sustainable mobility were sent to municipalities with more than 50,000 inhabitants and to third sector associations. The TSL received answers of 8 stakeholders (2 not-for-profit

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associations and 6 municipalities and one in-house company, which also represents a municipality). Their answers were valuable to understand their perception of the regional existing initiatives and how they can contribute to the transformation process towards climate neutrality by collaborating with quadruple helix stakeholders. The majority of them agreed with the importance of involving all stakeholders in the process because each of them can give a different contribution that can improve sustainable mobility. It was evident that there is a need of technical coordination among all public and private initiatives, policies and projects in place adopting a result-oriented approach based on a unified mobility/energy/smart city coordination at regional level. To assure long-term commitment of the quadruple helix in Emilia-Romagna, the region should include local municipalities through a strong and incisive awareness campaign. Through that, there would be a higher tendency to allocate resources to sustainable mobility projects and global energy improvement.

On 27th March 2023 Emilia-Romagna TSL organised an online workshop called "Public and private initiatives for sustainable mobility". The promotional banner of the workshop is seen in Figure 7. In this workshop four mobility managers from a University (University of Bologna), a company (Aeroporto Guglielmo Marconi – Bologna) and two municipalities (Municipality of Bologna and Municipality of Reggio Emilia) shared their experience and best practices. The audience was composed of all quadruple helix stakeholders and was encouraged to ask questions and express their opinion.

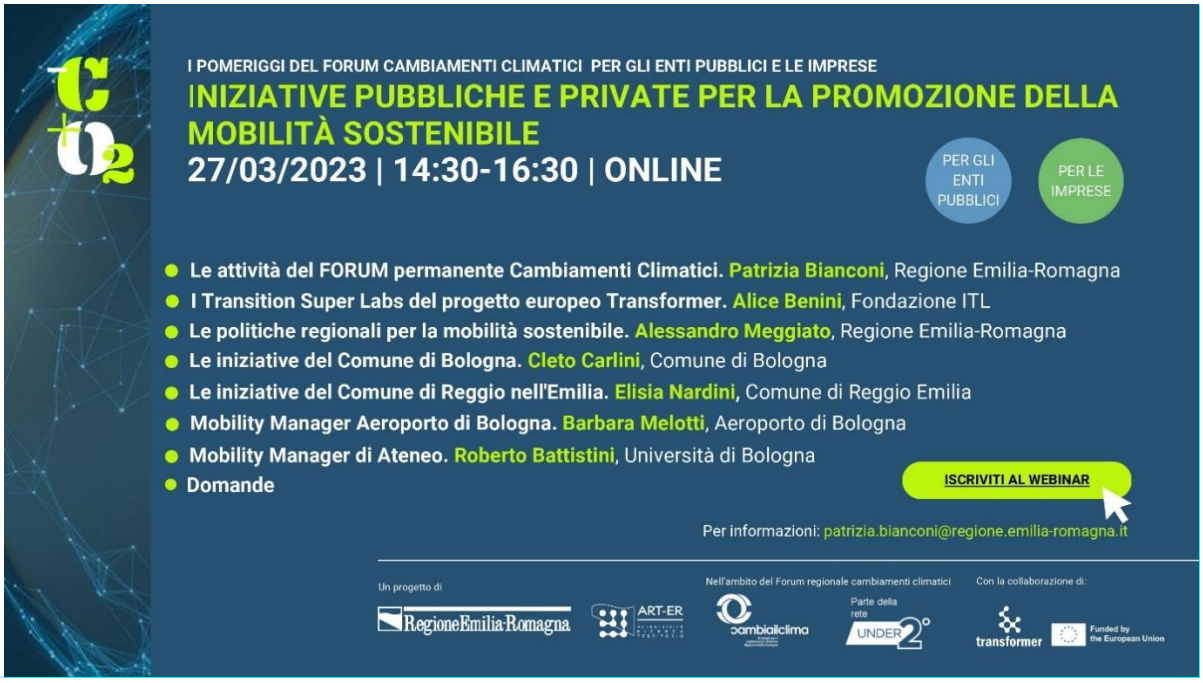

Figure 7 Emilia Romagna online workshop promotion

Four key take aways were retrieved from the workshop:

- Emilia-Romagna municipalities have been activating collaborative projects to involve citizens in the co-design of the initiatives.
- When it comes to the promotion of sustainable mobility it is important to nudge people toward more sustainable transit options without banning the original mode of transport.
- It is fundamental to involve more stakeholders in the mobility management activities.
- Emilia-Romagna Region is working on the implementation of a Regional IT platform for mobility managers of companies.

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Moreover, in parallel, Emilia-Romagna TSL has been conducting bilateral workshops with Electric Vehicles (EV) charging stations companies in order to collect EV charging stations usage data at regional level and discuss with them their future plans to optimize the existing infrastructure and improve the use of EV, as an important sustainable mobility solution.

To this date, workshops and interviews were held with the professionals from the following institutions:

- Iren Mercato SpA
- Enermia srl
- Hera Comm SpA
- BE Charge srl
- Enel X Mobility srl.

During the interviews, all participants emphasized the significance of municipalities in creating MoUs with EV charging infrastructure companies to effectively manage infrastructure in accordance with current requirements. Additionally, it was disclosed that providing incentives to companies and individuals is crucial for promoting electric mobility. Such incentives should not only encourage the purchase of electric cars but also provide training and informative sessions to enhance awareness and understanding of electric mobility.

5.2 Coalition Building in Lower Silesia

In order to create a coalition that optimally maps the quadruple helix, a classic stakeholder analysis was first conducted for the LGOM region. Main stakeholders were selected to identify the list of different models for LGOM's energy transition. The timeline of activities in Lower Silesia taking place before the start of the project and in the first year of the project is shown in Figure 8.

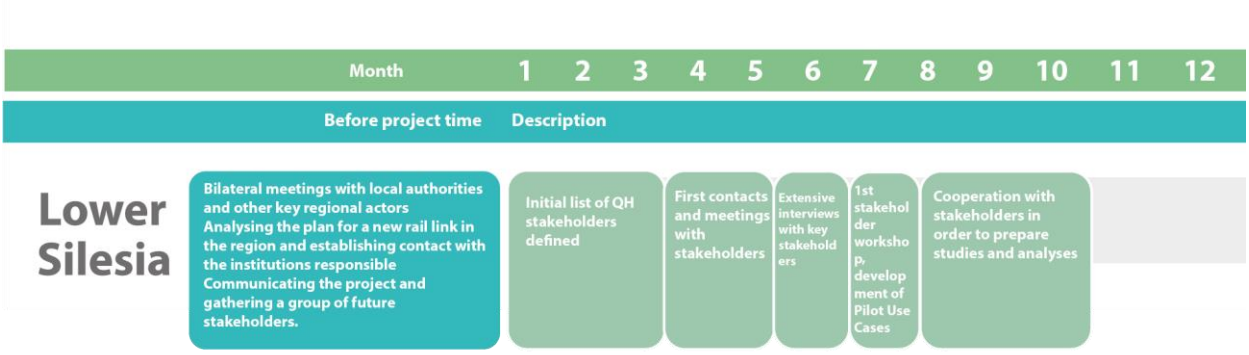

Figure 8 Timeline of engagement activities in Lower Silesia

Mapping of relevant stakeholders presented in October 2022 produced results seen in Table 2 and the expanded list is seen in Annex 2.

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Table 2 Stakeholder mapping of Lower Silesia

Type of stakeholder	Stakeholder name	Relevant influence / interest
Private sector – business / industry	KGHM (Kombinat Górniczo-Hutniczy Miedzi)	Biggest copper mining company in the region, 2nd biggest energy consumer in Poland; currently not interested in participating in the project
	Lower Silesia Railways	key stakeholder - the operator, which is responsible for operating rail services in the region and supporting them with bus services; highly interested in project and its outcomes
	Special Economic Zones	Economic zones of LGOM cities (Lubin, Legnica, Głogów, Polkowice) with industrial plants located there; not currently involved but potential beneficiaries
Green Society	Hydrogen and Energy Cluster of Legnica County	An organisation operating in the LGOM area made up of both organisations and individuals. Interested in the project and its results
Civil society	Dumni z Lubina, project partner	Local foundation representing civil society which is concerned with acting for the benefit of the region, stimulating its development
Academia	IRT – Institute of regional development	Support of researchers working for Voivodeship, develops plans and analyses related to the development of the region; one of the most important stakeholders
Public sector - Government	Local government, mayors, Marshalls of voivodeship etc.	The voivodeship board member for infrastructure is currently acting as a stakeholder involved in the project. In addition, stakeholders include the municipal and district authorities where the study and development of the TSL concept will take place.
	Ministry of Infrastructure	by agreeing to the construction of the new line, the ministry has become a potential stakeholder, but has not been involved at this time

Individual face-to-face interviews with the main stakeholders were conducted with:

- Maciej Zathey - the director of Institute for Territorial Development (an institute responsible for preparing the Energy Strategy of Lower Silesia),
- Tymoteusz Myrda – member of the board of the Lower Silesian Marshal's Office,
- Robert Raczyński – mayor of Lubin, the central city in LGOM region,
- Damian Stawikowski – the president of the Lower Silesian Railways,
- Piotr Podgórski – investment director of KGHM responsible for the deployment of small modular reactors (SMR) in KGHM.

In addition to these stakeholders which are essential players in the Region, ten interviews with citizens of LGOM were carried out (including workers of KGHM, residents of Lubin, where one of the locations

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for the small modular reactors is contemplated and finally, residents of villages close to the planned opencast lignite mine).

The conducted interviews allowed the TSL to clarify the views that different stakeholders have on energy transition in the region. It also showed that the energy transition to climate neutrality in an industrialized Region such as LGOM raises a lot of controversies. It revealed that the stakeholders have very different visions over the optimal energy transition path, including nuclear energy or a more rapid shift into the renewable energy sector with the use of H_2 within the recently created Lower Silesian hydrogen valley.
For some stakeholders, including members of the civil society, the war in Ukraine and the ensuing energy crisis has caused the need to re-evaluate the current EU climate policy and shift away from the plan of phasing out coal. In this regard, LGOM is a place where the largest proven lignite deposits are located. They are still considering the exploitation of these deposits as one of the viable options for countering the effects of the energy crisis caused by the conflict. However, this type of solution is unacceptable to both EU regulations and citizens living in the area. TSL workshops and meetings will aim to present solutions that are more beneficial to the environment and local communities and consistent with the project's and Europe's vision.

For the aspect of the vision that directly touches on transport issues, it has been possible to be in touch with key stakeholders from the outset. From the beginning of the project, stakeholders expressed a deep interest in new solutions that would ensure a reduced carbon footprint while providing people with additional mobility options. At the first TSL meeting of the LGOM region, everyone agreed that it was essential to tackle transport exclusion in the Region and that developing these solutions while listening to the public's voice was the most beneficial solution. This, combined with the direction of decarbonising the Region, is an idea that unites all TSL members despite their different opinions. It is assumed that this will allow the number of stakeholders to grow organically and lead to the materialisation of the activities of the Lower Silesian TSL.

5.3 Coalition building in Ruhr Area

To form a coalition that optimally maps the Quadruple Helix, a classic stakeholder analysis was first conducted for the region. Subsequently, relevant stakeholders were selected in order to map the complex stakeholder constellation as representatively as possible and to elicit the different perspectives on the transformation of a classic energy and industrial region and to draw a balanced overall picture. Based on a preliminary analysis of the region, the ramp-up of the hydrogen economy was also identified as a central milestone for the climate-neutral transformation of the Ruhr Area within the framework of the TRANSFORMER project. The timeline of activities in the Ruhr area taking place before the start of the project and in the first year of the project is shown in Figure 9.

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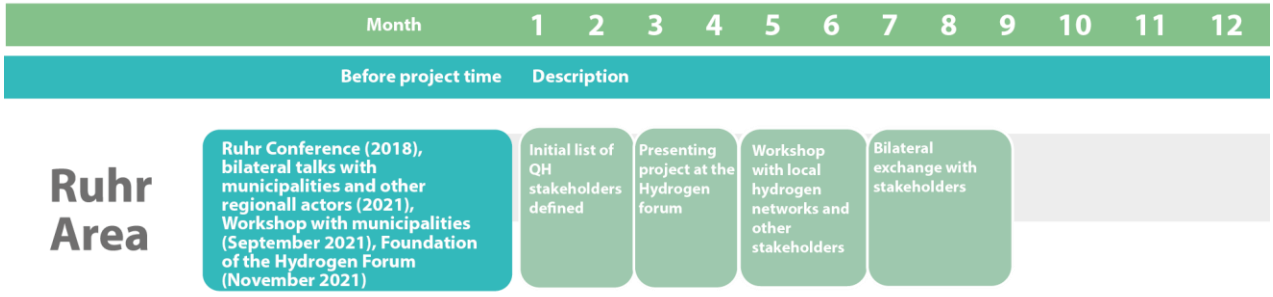

Figure 9 Timeline of engagement activities in the Ruhr Area

Mapping of key stakeholders for the project activities provided the following outcomes seen in Table 3.

Table 3 Stakeholder mapping of Ruhr Area

Type of stakeholder	Stakeholder name	Relevant influence / interest
Private sector – business / industry	Regional and municipal transport modes	Cooperation in the coordination of local transport
	Chambers of Commerce and Industry	Representation of the interests of the economy
	Initiativ-Kreis Ruhr	Association of major companies (corporate regional responsibility initiative)
	Large firms (ThyssenKrupp, RWE, chemical, etc.) and SMEs	Key energy providers and users
Green Society	Scientists for Future (regional groups)	Non-institutional, non-partisan and interdisciplinary association of scientists
	BUND (German Federation for the Environment and Nature Conservation)	Independent, federal NGO that has been dedicated to protecting nature and the environment
	Fridays for Future	international movement of school students for climate protection
	Emscher Genossenschaft Lippeverband	Adaptation to climate change /Green Infrastructure
Civil society	Welfare associations e.g. paritätischer Wohlfahrtsverband, AWO (workers welfare association)	Involving Affected and marginalized groups
	School and University Students	Mobilising the young generation not active in green society organisations

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	IGBCE (trade union for mining, chemistry and energy, DGB(German Trade Union Confederation)	Labour union in Bochum
Academia	University Alliance Ruhr =- Competence Field Metropolitan Research, Universities of Bochum, Dortmund and Duisburg Essen, Westfälische Hochschule	Transformative research, hydrogen research
	ZBT (Zentrum für Brennstoffzellen-Technik), Fraunhofer UMSICHT, GWI	Research Institutes
	Wissenschaftsforum Ruhr	Network of 30 research organisations in the Ruhr
Public sector - Government	RVR (Regionalverband Ruhr)	Government office
	3 District Governments	Political support
	BMR (Business Metropole Ruhr)	Project partner
	Landesregierung NRW	Political support
	Network of climate protection managers	Link to 53 municipalities

BMR has been working on coalition building trying to involve as a first step the most relevant stakeholders from the Ruhr Area who are active in the field of hydrogen. Given the fact that hydrogen is an emerging topic with a growing number of actors, BMR decided to first discuss TRANSFORMER in the framework of the region's hydrogen forum (workshop on 22 November 2023) which includes more than 35 representatives of different societal sectors throughout the whole Ruhr Area with its 53 municipalities and over 5.1 million inhabitants. Most of the participants belong to the public sector, another important group comes from research, some participants come from the civil society (associations) and from private companies. TRANSFORMER was critically discussed at the workshop. It was generally acknowledged as a potentially useful project for the region. At the same time, several participants critically noticed that it would be necessary to elaborate on concrete ideas for the TSL as early as possible to ensure a broad involvement of different stakeholders from the region (especially companies). Still, the members of the hydrogen forum who can be considered as some of the key stakeholders and door-openers for approaching and involving further stakeholders in this coalition building process, generally committed themselves to support the project.

In close cooperation with Hydrogen Ruhr Metropolis, the hydrogen coordination entity run by BMR and its mother organisation RVR, a workshop was held on 19 January 2023 that involved the region's 14 local hydrogen networks in project development. At this workshop, six concrete hydrogen projects with regional significance were compiled, which could form the core of the Action Plan.

In order to proactively develop these projects with the stakeholders of the Quadruple Helix from the beginning, the above-mentioned stakeholders were asked about their view on the project ideas. In

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this way, a broad participation of all societal groups, especially civil society, should be achieved. By doing so, the greatest possible acceptance for the upcoming transformation measures should be reached. This process consists of two measures. First, all participants of the workshop and other key stakeholders have been invited to express their view on the possible pilot use-cases. Second, key stakeholders who were not able to join the workshop have been invited to participate in bilateral meetings where they can share opinions on the TSL in general and the use-cases in particular.

The process described in this chapter sums up the first phase of coalition building. It has focused on the involvement of the key stakeholders whose relevance for the TSL has been assessed as particularly high for the TSL according to the stakeholder analysis. Furthermore, due to their knowledge, experience, and networks in the field of hydrogen, they are expected to be the "door-openers" for involving further stakeholders at a later stage of the TSL development. At the same time, an important goal of this initial coalition building has been to shape a group of regional actors that would be neither too small to avoid lock-ins nor too big to allow for active participation. The second phase of coalition building will be directly related to the development of pilot use-cases. It will address and involve more specific regional actors considered as particularly relevant for successful design and implementation of use-cases.

5.4 Coalition Building in Western Macedonia

The first stakeholder mapping exercise, as seen in Table 4, held in October 2022 provided a shorter list of stakeholders. These were expanded during the consequential exercises to include a comprehensive list that encompasses all sectors of the quadruple helix, shown in Annex 4. The timeline of activities in Western Macedonia taking place before the start of the project and in the first year of the project is shown in Figure 10.

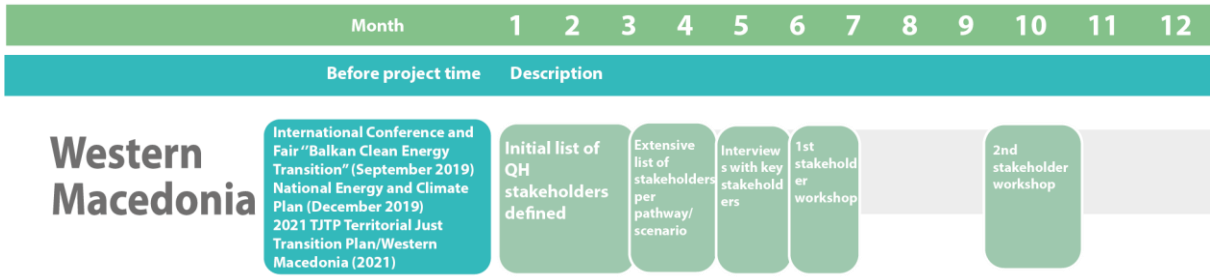

Figure 10 Timeline of engagement activities in Western Macedonia

Table 4 Stakeholder mapping of Western Macedonia

Type of stakeholder	Stakeholder name	Relevant influence / interest
	Agri-food stakeholders	Application of carbon reduction capabilities
	Energy industry	Providers of electric power storage solutions including all its technological innovation, know-how and expertise in the field of energy generation

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Private sector – business / industry	Local entrepreneurs/ Cluster of Bioeconomy and Environment of Western Macedonia (CLuBE)	Development of synergies between local and regional players and businesses in bioeconomy and the environment, aiming at introducing and developing innovation in different sectors and increasing the added value of the provided services.
	Transport providers	Crucial, potential users and facilitators for change
Green Society	Waste Management Company	Manager of the forthcoming Circular Economy Park of W. Macedonia that will host enterprises and research units involved in CO_2 capture & CO_2 emission reduction technologies
Civil society * to be further identified	Education association	Validation of the feasibility aspects of the use cases
Academia	University	Academic body - Research and Technology expert
	CERTH (HIT and CPERI)	HIT: Research institute with expertise on mobility and Living Lab methodologies (host of Thessaloniki Smart Mobility Living Lab, consortium partner) CPERI: Chemical Process & Energy Resources Institute, department in WM)
Public sector - Government	Ministry of transport and mobility	Incorporation of transition initiatives in policy and programming documents and funds
	Region of Western Macedonia	Key beneficiary of the TSL processes

The extensive list of stakeholders per pathway was developed early December 2022 and their potential contribution was identified (see table in Annex 4). These stakeholders representing the 3 out of 4 parts of the quadruple helix of Western Macedonia region's (academy/research, public authorities, and industry) were contacted via email mid-December and asked for confirming their interest by the end of the month.

21 stakeholders confirmed their high interest in the implementation of a TSL in the region, expressing in parallel the need for further explanations on how it will work in practice and what will be the benefits for them. Among the confirmed stakeholders, key ones per pathway were identified for the interviews. Finally, 6 interviews were held with the following stakeholders: Municipality of Kozani, Association of Urban Buses of City of Kozani, Cluster of Bioeconomy and Environment (CLuBE) of Western Macedonia, DIADYMA SA - Waste Management of W. Macedonia Region, Proud Farm - sheep and goat farming and Technical Chamber of Greece - Department of W. Macedonia. During the interviews, the stakeholders were asked about the strengths and weaknesses of the region to achieve the goal of climate neutrality as well as the measures that should be implemented at technological, political, legal, economic and social level for accelerating the transition. The goal was to extract stakeholders' perception of the transformation challenges and barriers and how these barriers could

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be removed. While the insights obtained from the interviews were valuable in comprehending the regional context and stakeholder dynamics for organizing the initial interactive workshop, the information gathered was rather general in nature.

The valuable input collected during the interviews was used as a basis to trigger the discussion with the stakeholders during the 1st stakeholder workshop that took place on 23 February 2023 with the participation of more than 30 representatives of stakeholders, pictured in Figure 11.

Figure 11 Stakeholder workshop in Western Macedonia on 23rd February 2023

The workshop's goal was to trigger the discussion with the stakeholders about the enablers and the barriers of each pathway in order to gain knowledge on the purposefulness, feasibility, sustainability and risks of these specific pathways. To eliminate the risk of having a generic discussion that wouldn't contribute at the later stage of the use cases definition, the methodology of SWOT analysis was used as a proxy for purposefulness, feasibility, sustainability and risks aspects. This methodology was implemented successfully, and dedicated questions seen in Figure 12 guided the discussion with the stakeholders towards the desirable direction. The workshop resulted in 3 SWOT-like schemes, one for each pathway. Their analysis will be used during the development of the feasibility studies that will be validated with the stakeholders during the 2nd stakeholders' workshop, to be held in May 2023.

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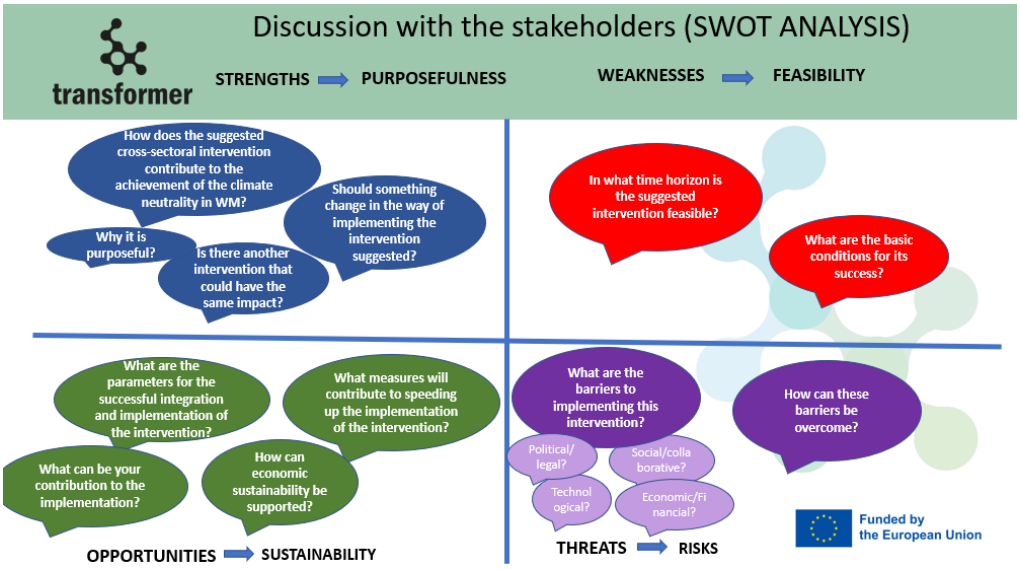

Figure 12 SWOT analysis used as a proxy for purposefulness, feasibility, sustainability and risks aspects during 1st Stakeholder workshop in Western Macedonia

Transition Super Lab of Western Macedonia follows the four steps of Open Innovation Community life cycle for transition support and innovation integration depicted in Figure 13. This process will enhance the local partnerships transformation and paradigm shift to international/global partnerships for sustainable cross sectorial development allowing for global solutions success to local environments. The current stages of coalition building including the interviews and the workshops are part of the first step of ''Strengthening innovation'' by consuming the capacities of the local ecosystem and using common knowledge and understanding of the challenges to achieve the transition towards climate neutrality.

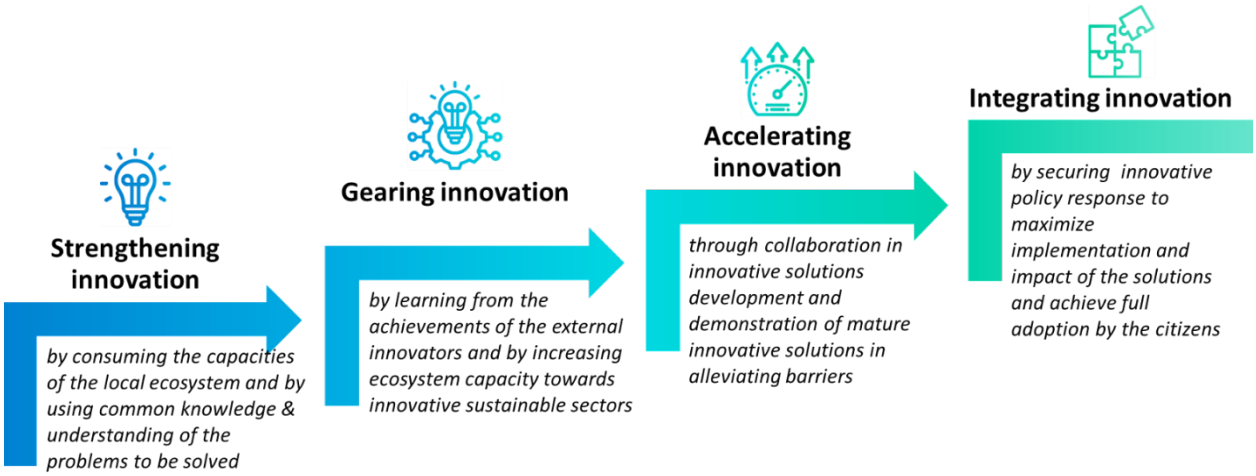

Figure 13 Steps of Open Innovation Community life cycle for transition support and innovation integration

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6 Citizen engagement

The following chapter focuses on the citizen engagement activities in the TSL regions. While each TSL has identified a large number of stakeholders through the coalition building exercise, the citizen engagement has been the most challenging aspect of this activity. For this reason, a dedicated training workshop was held in February 2023 organised by ENoLL and RUB.

6.1 Citizen engagement in Emilia Romagna

Emilia-Romagna TSL started to involve citizens by engaging third sector associations, such as Legambiente and FIAB (Italian Environment and Bicycle Federation). Legambiente is the most prominent and widespread environmental association in Italy while FIAB is an environmental organization that promotes the daily use of the bicycle and cycle tourism to protect the environment and fight the climate crisis. These not-for-profit associations are very well known by citizens of Emilia-Romagna Region and can contribute to awareness raising activities. In particular on the topics of adoption of sustainable daily behaviours through specific initiatives and events that promote citizen participation and dialogue. In order to enhance citizens' engagement in Emilia-Romagna Region the TSL discovered that it is necessary to activate and promote more sustainable mobility institutional initiatives. These include "Bike to Work" (incentives for home-work and school-work transfer by bicycle and bike sharing), "Job Ticket" (incentives for the use of local public transport for home-work travel), widespread availability of bicycle parking with covered racks and anti-theft devices, electric bike incentives, car and bike sharing mobility vouchers, "Mi Muovo" (integrated pricing system that allows Emilia-Romagna citizens to use different modes of transport). Moreover, it is important to organize informative and training sessions to allow citizens to express their views, opinions, doubts and ask their questions on these topics. During TRANSFORMER project, third sectors associations and citizens were involved through an online workshop "Public and private initiatives for sustainable mobility" on 27th March 2023, which was described in the previous chapter. The workshop is one of many opportunities to establish a dialogue with local administrations, citizens, universities, and productive sectors to inform and discuss mitigation and adaptation policies at local level.

6.2 Citizen engagement in Lower Silesia

Interviews with local citizens revealed that more meaningful civil society involvement in coalition building is needed. These interviews were based on a random selection, by stopping citizens on the streets. Individual interviews with the major stakeholders demonstrated that civil society's opinions are not sufficiently taken into account when setting strategies and plans for the region's energy transition. Of course, the small sample size of the interviews does not allow generalizing the results, but it clearly showed that some of the plans being considered by the key stakeholders are highly controversial. Some respondents were concerned about plans to build SMRs, mostly if they were planned near where they lived (the well-known "Not in My Backyard, NIMBY" effect). The results call for greater civil society involvement.

Regarding issues directly related to transport, meetings were held with transport-excluded communities. The meetings were held to observe people's attitudes towards low-carbon transport. More specifically their preferences and needs were discussed in 3 municipalities. An invitation was

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sent to participants to take part in the project as stakeholders, but so far no one has expressed a wish to participate.

To that end, the TSL plans to conduct an energy-related study. Through it, a sample of 400 LGOM residents will be presented with various energy transition options. These include a stronger transition to RES, nuclear power development or exploitation of local lignite deposits and development of traditional lignite-based power plants). This survey will be combined with the transport survey. The TSL is keen to learn about the public's will to create solutions that are not only zero-emission but also effective.

6.3 Citizen engagement in Ruhr Area

Generally, citizen engagement in coalition building and TSL development is considered an important issue in the Ruhr Area. However, it was not possible to involve this group during the first stage of coalition building. First, it is not easy to achieve citizen involvement and engagement as long as the value and the outcomes of the project are not concrete yet because the project is still in a very initial phase. Second, the topic itself needs to appear at least relevant to the target group even if the outcomes and the benefit are not clear yet. In case of hydrogen, this topic is increasingly discussed throughout the society, but it is still a minor topic in public debates despite its enormous relevance. The use of hydrogen is controversially discussed, and the discussion will certainly intensify in the future as soon as application beyond industrial purposes and mobility will become more realistic (e.g., housing and heating).

Depending on the development of the TSL through concrete pilot use cases, civil society groups, such as housing cooperatives, environmentalists, conservationists or energy cooperatives could play an important role. These groups will be approached in the course of the project when the pilot use cases are defined. Through the development of action plans for the pilot use cases, involvement of citizens and different societal groups will be more feasible. There will be concrete project ideas, which will require participation of actors and articulation of interests and expectations related to benefits and outputs.

At the same time, civil society has been already involved in the regional coalition building process through bilateral talks with trade unions and foundations. The role of trade unions is becoming increasingly important in the field of hydrogen in the Ruhr Area. About a third of jobs in the region are in the industrial sector, and the transformation of energy systems is an opportunity as well as a threat for industry and respective jobs.

6.4 Citizen engagement in Western Macedonia

Although civil society and citizens involvement in coalition building is considered as a critical parameter for the successful implementation of the TSL's activities, this group wasn't involved in the first stage of interviews and the 1st stakeholders' workshop.

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Persuading citizens to participate in such kinds of activities and keeping them engaged is a quite challenging and difficult task since they should be convinced that there will be tangible outputs that will improve and facilitate their daily lives. Western Macedonia TSL team identified the following civil society groups that could be involved in the TSL: equality research and social inclusion NGOs, environmental NGOs and students' groups. Additionally, as the waste management association-DIADYMA S.A organises various raising awareness activities for citizens and students, it could become TSL ''ambassador'' for the engagement of civil society at a later stage.

During the 1st stakeholder workshop on 23 February 2023, it is mentioned that in the region there is an active energy community consisting of the Region of Western Macedonia, the Regional Development Fund of Western Macedonia, 13 municipalities and the university of Western Macedonia. Additionally, the need of creating an energy community of citizens was highlighted by the stakeholders. The civil society groups identified will be contacted and engaged at a later stage of the process when the feasibility aspects related to citizens will be at a more mature level to be presented as arguments for incentivizing them to participate in the TSL initiative.

7 Recommendations

7.1 Recommendations for vision finding process

The experience of the four TSL regions shows that although a vision building process can be a quite challenging exercise, it should be an open, participatory, and interactive process including representatives from all societal sectors right from the start. However, stakeholders may not necessarily feel attracted by very broad, general discussions when the value and the outputs are vague. They can even get critical about the concept as a whole if their impression is that they are just spending their resources and sharing their knowledge for an unclear goal and undefined benefit. Then again, a vision building process cannot be exclusive regarding the thematic spectrum. It must be open to ensure no relevant topic and aspect is disregarded. Nevertheless, the sooner it gets concrete the more targeted the thematic development of a TSL would be. Therefore, it has proven useful to work with so-called sub-visions or, in other words, to illustrate the vision with tangible ideas, making a TSL as little abstract as possible.

Vision building should not be a static process. A TSL provides a fertile ground for experimenting and initiating transformation. Hence, vision building needs to be dynamic and correspond to the reality of a TSL and the context in which it is embedded. The same applies to stakeholder involvement. A coalition should be open for so-called unusual suspects and not just address those who are evidently the leaders or have a generally acknowledged mandate for action in the respective field. Certainly, for a regional coalition to develop a vision for climate neutrality with a TSL as a key instrument, it is necessary to have both a critical mass and a realistic size that would allow to build trust and be able to work. Therefore, it makes sense to address some key stakeholders at the beginning of the process, but then to arrange working groups with further stakeholders according to more specific topics. A lock-in is a permanent threat to a vision and coalition building process. It is not unusual to strike well-known paths or just to rely on the political agenda, overlooking the transformative or the systemic notion that should be inherent to a TSL.

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Another challenge for the vision building process partially lies in the idea of TSL itself as it basically addresses the regions and at the same time pursues the principle of bottom-up. Regions and respective regional authorities are not the only, but the most obvious driving forces behind a potential TSL. They have the political power, the resources, and the steering capacities. As long as they have a leading role in the process of vision and coalition building, there is at least an undeniable top-down component. Awareness of including the bottom-up perspective is indispensable, ensuring that the whole TSL process becomes truly participatory, and decision-making is not (merely) top-down.

The work done so far in the four TSL regions has demonstrated that the vision building process also depends on the context of each specific region. The recommendations therefore need to consider different factors, such as the political system, the administrative organisation, the economic structure, or the historical context. For that reason, exchange among the four TSLs through internal workshops has been crucial for better understanding of the differences, but also guaranteeing that the idea of TSL is not getting lost.

7.2 Recommendations for Coalition Building

Coalition building is an essential element of the TSL process. By following the Living Lab methodology, coalitions are comprised of the quadruple helix stakeholders. In the TRANSFORMER project, the process of coalition building consisted of various stakeholder mapping exercises. In the first stage of the project, October 2022, partners mapped their stakeholders as seen in Tables 1-4. The TSLs repeated the exercise in early 2023 with a more extensive stakeholder list (Annex 1-4). These were discussed with ENoLL, RC and RUB in February 2023. In addition, a separate civil society mapping workshop was conducted in February 2023.

Based on the input collected from the TSLs regarding the coalition building, the main gaps identified that prevent the coalition building process from being more effective and inclusive are related to the strategy of the TSLs, focusing on different aspects presented below:

- Lack of a specific strategy for civil society engagement. The civil society engagement has been a challenging element for the TSLs. However, they have not dealt with the civil society engagement process in a specific way that takes into account the great diversity within this group especially on a regional scale in terms of knowledge, mentalities and awareness.
- Lack of familiarity with the appropriate co-creation methodologies. Using the right co-creation methodology is an essential element to effectively collaborate with the coalition members.
- Difficulty in identifying and reaching out to marginalized groups: The types of marginalised groups vary according to the topic and the TSLs have had difficulties in defining the marginalised groups without the specific use cases. This is more evident in particular for the TSLs working on the topic of hydrogen. Although marginalized groups often vary according to different elements such as region or sector, it is advised to define common questions that help identify them.

The coalition building process is complex and it is important to set a clear strategy, outlining the objectives and expected outcomes, and identifying how to achieve them. Coalition building process should not be limited to mapping the stakeholders and consulting them. This process requires a clear and structured strategy with different steps to follow, including the definition of precise objectives, a

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communication strategy, a monitoring system, etc. Below are the different steps to follow in order to set and implement a coalition building strategy:

a) Define the expected objectives and results
b) Identify and understand the stakeholders' needs
c) Develop a shared vision and communicate
d) Establish an action plan
e) Evaluate the coalition building process

a) Define the expected objectives and results

Before involving stakeholders in coalition building, it is essential to have a precise and clear understanding of the objectives or expected results of the stakeholder engagement process. This will define the expected outcomes of the desired stakeholder contributions and the impact they will have on the TSLs' projects. It is also crucial to be realistic in terms of what they can achieve. This first step will also help identify the right audience to involve and choose the right participation and co-creation methodology.

b) Identify and understand the stakeholders' needs

Stakeholder mapping is a crucial step for TSL coalition building, as it helps identify the key stakeholders who will be affected by the project. This step also consists of understanding the needs, expectations, and motivations of the different stakeholders.

In order to carry out an effective mapping, it is essential to first start by establishing a list of all the key stakeholders for each category of the quadruple helix (academia, public authorities, business and civil society). To develop the list of stakeholders, it is important to define the geographical area of implementation of the use cases or the geographical area for which impact can be created and assessed from the use cases implementation. Scalability aspects should be considered already at this stage in order to identify who by priority should be contacted. Then, it is important to prioritize them and classify them according to their importance, influence, and their interest for the TSL. Classification can also be done in the following way; important to secure feasibility, involved at the implementation, veto stakeholder, impacted by the implementation and transition facilitator. Furthermore, it is strongly recommended to take the time to analyse the stakeholders identified in order to better understand their expectations and motivations. This can be done through interviews, focus groups or by sending out surveys.

The stakeholder's identification exercise may be slightly different from the stakeholders mapping for Living Labs, taking into consideration the two following points:

- Regional scale: TSL are operating at a regional level.
- The climate neutrality mission: All TSLs aim to contribute in the transition to climate neutrality.

It is therefore important to keep in mind the regional scale and the TSL mission in the stakeholders mapping exercise.

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In the case of Western Macedonia TSL, it was observed that the stakeholders whose decisions may have more impact in the achievement or the non-achievement of the region's objectives towards climate neutrality, need to be identified at an early stage and a strategy on how they should be approached and engaged should be planned in detail. The TSL also observed that the management of cross-sectorial stakeholders is more challenging than the management of a sector-based ecosystem and thus, a different approach should be followed. Towards this direction the role of a "leader" stakeholder able to "govern" other stakeholders under the umbrella of the TSL needs to be defined and innovative governance mechanisms to be implemented.

Consider the diversity of stakeholders within the same region

Even within the same region, the mapping of stakeholders can vary according to the specificities of each sub-region or city. There may be significant differences in key stakeholders, their needs and expectations depending on their precise geographic location.

For a region with sub-regions or cities, social, cultural or economic differences should be considered to identify relevant stakeholders and their interests. For example, stakeholders in an industrial city may have different expectations and needs than in a university city.

Define the value proposition for each group of stakeholders in relation with climate transition

All TSLs work towards a single goal which is the transition to climate neutrality. During the consortium meeting in March 2023, TSLs drew attention to a key element regarding the stakeholders mapping for TSL, which is to identify the value proposition in relation to the climate transition for each group of stakeholders. This helps to ensure that the benefits of the TSL mission are clearly understood and that stakeholders are more likely to support the project.

To define the value proposition for stakeholders in relation to the transition to climate neutrality, it is important to consider the positive impacts that TSL can have on society and the environment, as well as the economic benefits, such as energy cost reduction or job creation in green sectors.

Western Macedonia TSL also saw that valuable information can be extracted through face-to-face interviews with stakeholders about their role in the transition process. However, as each stakeholder has a different perception of the transition concept, an introduction of what contribution is expected from them should be prior done introducing to them broad categories of stakeholders' roles in a transformation process, for example provider of tools and data for building common understanding creation, capacity for conflict solving, implementer, conditions creator, one stakeholder mobilising many other stakeholders in a field etc.

Mapping of stakeholders' relationships

TSLs should have a clear image about the stakeholders' relationships. Not only that the current relationships should be identified but also potential relationships need to be explored in the context of achieving the transition. By mapping these relationships, TSLs acquire the first basis upon which the cross sectorial synergies could be built.

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c) Develop a shared vision and communicate

Developing a shared vision among the stakeholders is vital for the success of coalition building. It is essential to ensure that every coalition member comprehends the mutual objectives, values, and principles. A common vision promotes cooperation and coordination among the stakeholders.

The main recommendation from Emilia-Romagna TSL is that before involving and contacting external stakeholders it is necessary to establish an internal coordination at institutional level among all regional departments on the addressed cross-sectoral topic. For example, Emilia-Romagna Public Authority is a very complex institution composed by different departments/directorates, each one specialised on a specific topic (i.e. public transport and sustainable mobility; energy and green economy; environment; agriculture, etc.). TRANSFORMER project addresses cross-sectoral themes that involve more than one regional department with complex and different dynamics.

When a region has a clear overview on all funded and implemented projects at institutional level on a topic, it is possible to involve also other stakeholders' groups in order to understand how the existing solutions and initiatives can be improved and harmonised. Moreover, it is difficult to organize a workshop with the presence of all quadruple helix stakeholders together. In order to start building a coalition it is easier to start from dedicated workshops with specific groups of stakeholders on a single topic (e.g., bilateral workshops on EV infrastructure with EV charging stations companies). Moreover, in order to engage citizens, it is necessary to involve third sector associations and organize informative and training sessions to promote the adoption of sustainable behaviours and inform them on the existing public and private initiatives.

During the stakeholders' workshops and meetings, the risk of having a generic discussion that wouldn't contribute at the later stages of the engagement activities is high. To eliminate this risk, in Western Macedonia TSL the methodology of SWOT analysis was used as a proxy for purposefulness, feasibility, sustainability and risks aspects of each use case. This methodology was implemented successfully, and dedicated questions guided the discussion with the stakeholders towards the desirable direction. The SWOT-like schemes (one per pathway) resulting from the implementation of this methodology are a valuable input for a TSL as they provide a clear image of enablers and barriers of each pathway. For this reason, the suggested methodology contributes to the finalization of the use cases using a bottom-up approach and to the development of high-quality and complete feasibility studies in the next steps. Nonetheless, to create a shared vision with all stakeholders, a communication strategy must be established, emphasizing clear and transparent communication with stakeholders. It is recommended to start by identifying key messages for each group in relation with the value proposition defined in the mapping/understanding exercise in the previous step. The appropriate communication channels need to be chosen afterwards accordingly to reach out to the stakeholders. Additionally, it is crucial to listen to stakeholders' feedback attentively and respond quickly and efficiently to maintain their engagement and motivation. Furthermore, the communication strategy should also emphasize the frequency of communication with coalition members, which should be regular. Coalition members should remain informed of progress, achievements, and challenges. The communication strategy must be regularly evaluated to ensure that the common vision is maintained and that the key messages are well understood.

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d) Establish a stakeholder engagement plan

After developing a shared vision among the coalition members, it is important to create together a detailed stakeholder engagement plan that clarifies next steps to achieve common goals. This plan should include timelines, responsibilities, and metrics to track progress.

This action plan needs to be evaluated regularly throughout its implementation and adjusted, if necessary. If obstacles arise, it is important to collaborate with coalition members to find effective solutions.

Furthermore, The TSL should always keep in mind that the goal of coalition building is to join efforts and skills in order to create solutions. The coalition members should not be contacted only when the TSL have a clear action plan to communicate, but they should also be involved at every stage, even in the definition and validation of the action plan. This helps foster their ownership as well as the transparency of the engagement process.

e) Evaluate the coalition building process

Relationships with coalition members may vary and their expectations and priorities may change over time. It is strongly recommended to assess the degree of satisfaction of the coalition members on a regular basis and to adjust the coalition building strategy accordingly. This can be done through interviews, one-to-one meetings, or surveys. The external environment can also have an impact on the coalition building process such as the political priorities of the region and it is crucial to continuously monitor the changes and adapt the coalition building strategy.

7.3 Recommendations for citizen engagement

It has been observed in previously studied Living Labs and the TRANSFORMER TSLs that it is often less challenging to engage academia, business, public authorities in comparison to civil society stakeholders. Yet, it is essential to engage this part of the quadruple helix as it represents the end users and involving them guarantees that the transformation process is fair and democratic (Ingram, 2020). It should also be remembered that not involving citizens/civil society could lead to a lack of transparency and also purely technical innovation instead of social innovation. It is for this reason that the challenge of engaging civil society in social innovation has been addressed multiple times. In the case of the transition to climate neutrality, which represents the common objective of the Transition Super Labs, it is not possible to solve the problem through technical solutions only. It is crucial to create awareness of the challenges tackled by the TSLs among citizens and engage them in the solution development process. Thus, there would be a greater chance that solutions put in place by TSLs will be taken up by the local residents (Climate-KIC, 2020).

However, citizen engagement requires application of the right approach and TSLs need to take into consideration several elements to see a successful citizen engagement process. In this context, recommendations have been developed to support pilots or future TSLs in the citizen engagement process. These are based on the various discussions and meetings with the TSLs of the TRANSFORMER project and on previous experience with citizen engagement initiatives.

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Civil society refers to all forms of social action taken by individuals or groups that are independent of state authorities, both formally and legally. Given the diversity of this stakeholder category, it is essential to first identify the groups of people that should be involved.

In a report published by OECD on Guidelines for Citizen Participations Processes (OECD, 2022), different types of citizens that can be involved in the engagement process have been identified. These are:

- Broad, non-representative group of citizens
- Representative sample of a community
- Citizens from a specific geographical area
- Citizens of a sectoral group (youth, elderly, students, indigenous communities, etc.)
- Stakeholders such as NGOs and trade unions

Following a stakeholder mapping exercise, the civil society stakeholders should be categorized according to the level of importance to the project and their expectations (Bourne, 2010). This can be done with the Interest vs. Influence matrix methodology. This exercise is imperative prioritising stakeholders and ensuring that most important stakeholders are given most attention and resources as well as preparing an appropriate communication strategy.

Identify diverse civil society groups

The identification of the civil society groups is performed during the stakeholder mapping activity; a brainstorming exercise through which all potential stakeholders are named. It is important to reach citizens from diverse backgrounds to increase representation in the engagement process.
Defining in advance the expected results of the engagement of each group of citizens can aid in determining the type and method of participation. It is essential to remember that addressing a particular issue may require engaging with various groups that necessitate different participation methods and conditions.

Appropriate language and common understanding

Citizen engagement in a TSL can be challenging when citizens fail to see the direct relevance or connection of the TSL project to their daily lives. This is particularly evident in the context of the transition to climate neutrality, where many people perceive the subject as abstract and distant, while their concerns remain concrete and immediate. However, it is important to emphasize that the climate issue is intricately linked to our daily lives and significantly impacts citizens' health. To overcome this challenge, it is crucial to create awareness among citizens about the topic and its relevance to their daily lives. This can be achieved by providing explanations on greenhouse gas emissions, renewable energy sources, sustainable consumption practices, and other related aspects. By fostering a common understanding of the problems that TSLs aim to address and their mission, it becomes possible to establish a meaningful dialogue with the identified citizens' group.

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Ensure communication through appropriate channels

In addition to establishing a common understanding, it is equally important to use the appropriate communication channels to engage citizens effectively. TSLs should carefully select the channels through which they disseminate information and engage with citizens. These channels should be accessible and tailored to the specific target audience. Utilizing a combination of traditional media, such as local newspapers and television, and digital platforms, such as social media and online forums, can help reach a wider range of citizens. Furthermore, engaging local community organizations, schools, and other relevant stakeholders can facilitate the dissemination of information and foster dialogue at the grassroots level. By employing these appropriate channels, TSLs can maximize their reach and ensure that citizens have the necessary information and avenues to actively participate in the initiatives.

In addition, raising awareness on a regional scale is likely to be challenging for the TSLs. It is then crucial to set up a partnership with regional authorities, municipalities, cities, or even private local companies to collaborate in organising campaigns that aim to reach and inform citizens about the climate emergency and its challenges. This can be carried out through digital campaigns via social networks, public events, conferences, etc. Creating awareness on the climate neutrality topic is a very important step in the citizen engagement process for TSLs as it helps to set the stage for meaningful dialogue and interaction with citizens afterwards (UNaLab, 2019).

Younger citizens might prefer online and social media when it might be easier to reach older citizens through local newspapers, posters or at supermarkets. Also, it is highly recommended for the TSL to use the channels of the regional authorities, also of the cities and municipalities to reach and communicate with citizens. This shows the ownership of the TSL project by the region and therefore inspires more confidence to motivate citizens to engage (Ståhlbröst, 2012).

Incentives

One of the barriers identified in the citizen engagement process can also be lack of time and resources. It is therefore important to define a compensation for citizens to emphasize that benefits from the engagement will be worth “sacrificed” time and resources. However, compensation should not be perceived only as a financial incentive. Rather, it is a means of recognizing the citizen engagement and fostering their inclusive participation (OECD, 2022). Below are some examples of possible non-financial compensation drawn from the OECD report:

- Capacity building: TSLs can offer training and skills development sessions to help citizen participants better understand the issues and become more involved in citizen participation activities. Offering new information or skills to citizens can increase their interest in participation.
- Recognition and visibility: In the context of citizen participation, it is essential to recognize and value the commitment of participants. This can be done in several ways. For instance, TSL can offer significant visibility to participants by highlighting them through local media or other relevant communication channels to value their contributions. In addition, TSLs can enhance recognition of engaged citizens by issuing certificates of participation. These certificates serve

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as formal acknowledgment of their valuable contributions and serve as evidence of their active involvement. By receiving these certificates, participants can feel a sense of pride and accomplishment, knowing that their efforts have been recognized and valued.

- Making participation a social moment: Citizens can be motivated to participate if this offers them the opportunity to meet other members of their community or other citizens who share the same concerns. Participation can create a sense of belonging at the community level.
- Consideration of citizens' recommendations: The TSLs can take into account the recommendations of the participants among the citizens while implementing their projects to encourage their participation.

The allocation of incentives has also been emphasized by Western Macedonia TSL as one of the key recommendations. The TSL observed that through incentives the civil society sector is more likely to participate and stay engaged.

7.4 Recommendation for engagement of marginalised groups

In TRANSFORMER project, we commit to include marginalised groups of the civil society stakeholder group in the co-creation activities in order to ensure balanced representation of different layers of society. Marginalised groups are defined by the European Institute for Gender Equality as groups facing discriminations based on "sex*, gender, age, ethnicity, religion or belief, health status, disability, sexual orientation, gender identity, education or income, or living in various geographic localities*" (2023). On the other hand, the United Nations Human Rights Office of the High Commissioner examined the status of vulnerable people in the European Union and International Human Right Lawn publication (n.d.). It defined vulnerable people as those who did not speak the national language of the country they were living in as well as *"children, persons with mental or emotional impairments or disabilities and physical disabilities, persons with dependents, the illiterate, asylum-seekers, and those with a dependency on drugs or alcohol".* Woodcock et al (2022) further expand on the definition of economically disadvantaged groups by including elderly and people from minority and ethnic backgrounds, as well as the LGBTQI+ communities. And finally, Tovaas (2020) adds to the definition the geographical aspect, when it comes to transport inclusion, by adding people living in rural and/or remote areas, job seekers, those without a driver's license and sensorially and cognitively impaired or disabled (Tovaas, 2020). The definition of marginalized groups is therefore adapted according to the socio-economic fabric of each region and their use cases.

Inclusion of marginalised groups in mobility sector

In the context of transport systems, which are part of the vision of both Lower Silesia, Emilia Romagna and among the pathways of Western Macedonia, Woodcock et. al (2022) argue that the systems should be designed to enable all citizens to access the places they need and alleviate them from poverty. To tackle this problem, Titheridge et al (2014) suggests putting in place equity criteria to ensure that the marginalized groups have their needs met. In this way more targeted approach to understanding and improving mobility and accessibility would be used. With the inclusion of marginalized groups in the design process of the transport systems, transport poverty is avoided, in addition to other issues which are harmful to health and existing neighbourhoods. In its paper Lynce

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et al (2021) demonstrate that the current transport provisions only meet the needs of a third of EU citizens, while Pirra et al (2021) further elaborate on the exclusion of women and their needs. Women have been found to perform most household and childrearing roles (Carli, 2020) which are not accounted by the transport planning. Their transport patterns are also found to be different and various factors including safety have to be taken into account when preparing mobility plans.

An approach called TInnGO Intersectional Mobility Indicators has been developed to help design and evaluate inclusive mobility solutions. This approach helps visualize the nature of different characteristics, structural aspects of transport poverty and their relation to mobility patterns. The approach, presented in Figure 14 showcases in the blue inner right the characteristics associated with excluded groups, namely ethnicity, culture, age, ableness, religion, gender, and sexuality. The green ring represented the gender smart dimensions which the authors argue need to be considered when designing gender and diversity sensitive solutions. These are effective, inclusive, sustainable, affordable, and attractive. And finally, the outer bubbles in orange represent structural and political factors that contribute to transport poverty and social exclusion, namely: housing, economic activity, caring responsibilities (e.g., childrearing), income, education and social class.

The tool can be accessed at: https://transportgenderobservatory.eu/timi-tool/.

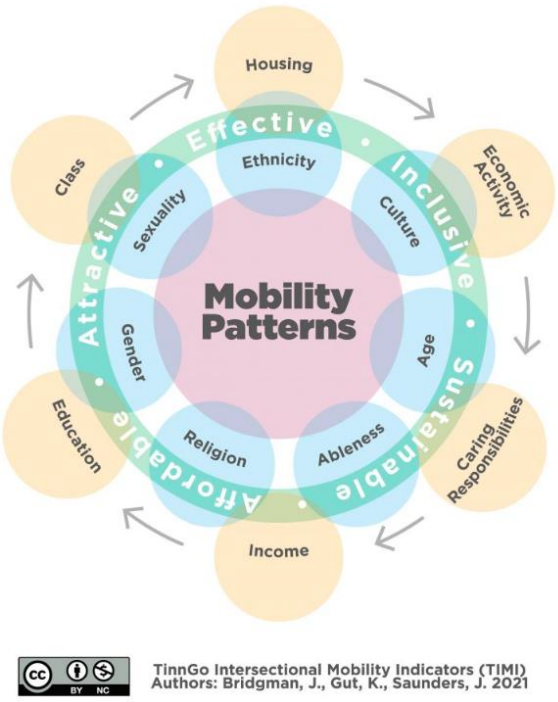

Figure 14 Intersectional Mobility Indicators

INCLUSION project, which assessed and evaluated the accessibility and inclusiveness of transport solutions in six European regions developed recommendations for eight principles and solutions when it comes to transport accessibility for all groups. These principles are accessibility, affordability, convenience, efficiency, empowerment, empathy, gender equity and safety (Tovaas, 2020).

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Regardless of the topic of use cases, TSLs would need to adapt their engagement activities according to the local audience, taking into consideration work schedules, child duties, linguistic barriers and other factors that might discourage citizens from participating. Overall, the type of marginalized will depend on the regional context and the topic of the use cases. In addition, the degree in which marginalized groups face inequality is diverse and as such the TSLs are obligated to thoroughly understand their local context and the community in the region, to respond effectively and adapt their engagement activities and communication campaigns. As TSLs use the Living Lab methodology which places the user in the centre of innovation, they are obligated to understand and resonate with the people living in the region.

7.5 Recommendations for designing a co-creative session

Co-creation is a multi-level process that fosters end-user participation in the innovation process. Proper implementation of co-creation can result not only in the generation of new solutions, but it can also lead to the reconfiguration of the entire system in which it occurs. Furthermore, choosing the right methodology is the key to a successful co-creation process (Frontiers, 2021).

For the purposes of the TRANSFORMER project needs and to support the TSLs in understanding and developing co-creation sessions, a "Co-creation methodology" canvas was developed. The canvas was built based on the needs of the TSLs, previous experience with co-creation workshops, and with the help of existing literature. Namely, *Co-creation workshop methodology handbook* (U4IoT, 2017), *Handbook for Urban Living Labs Developing Nature Based Solutions* (Habibipour, 2019) and *Designing and running co-creation workshops* (TPI, n.d.).

This canvas was presented to the TSLs during the training workshop held in March 2023 within the scope of the consortium meeting. This exercise was proven to be a useful tool for the TSLs not only in defining concrete steps for their upcoming co-creation activities, but also to refine and re-think their stakeholder mapping and internal resources. In addition, the workshop created an opportunity for a peer-to-peer review between the TSLs on their respective co-creation sessions.

Designing a co-creative session with the Co-creation workshops design canvas

The *Co-creation workshops canvas* shown in Figure 15 is composed of the following components:

- TSL vision, which is the central guiding point of the TSL stakeholder engagement activities.
- Context and stage of co-creation, where the TSLs note where the activity will be taking place and whether they are beginning their co-creation process, or designing a workshop that is part of a later exploratory stage.
- Objectives and expected outcomes of the co-creation session, as defined by the TSL team.
- Vision and scope of the session. In this part the TSLs can define if the co-creative session is referring to a particular use case.
- Value of the co-creation session for each stakeholder.
- Quadruple helix stakeholders mapping. It is imperative to map the stakeholders before designing a co-creative session.

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- In the design the session, the TSL needs to define the topic, purpose, time allotment, identification of facilitator or presenter and invited participants to the co-created session.
- Afterwards, the approach and method for the session need to be defined. Here, the toolkit for co-creation can be helpful.
- In the communication strategy part, the TSL needs to define how they will attract a diverse group of stakeholders to the session, what are the needs of the stakeholders and carve out the key messages for the communications and the right channels to attract them to the sessions. Each TSL needs to be as concrete as possible. During the exercise this quadrant can also help the TSLs re-think their previous inputs.
- Prior to designing the session, it should already be defined how the outcomes will be documented and shared. Here the TSLs should also think about data protection issues.
- And finally, once the co-creative session is completed in real-time, the TSL should already have a follow-up strategy in place. All Stakeholders should be involved in regular communication through 1) website 2) social media 3) in-person meetings 4) other channels. These channels should be defined based on their needs and preferences as stated in the point on the comms strategy.

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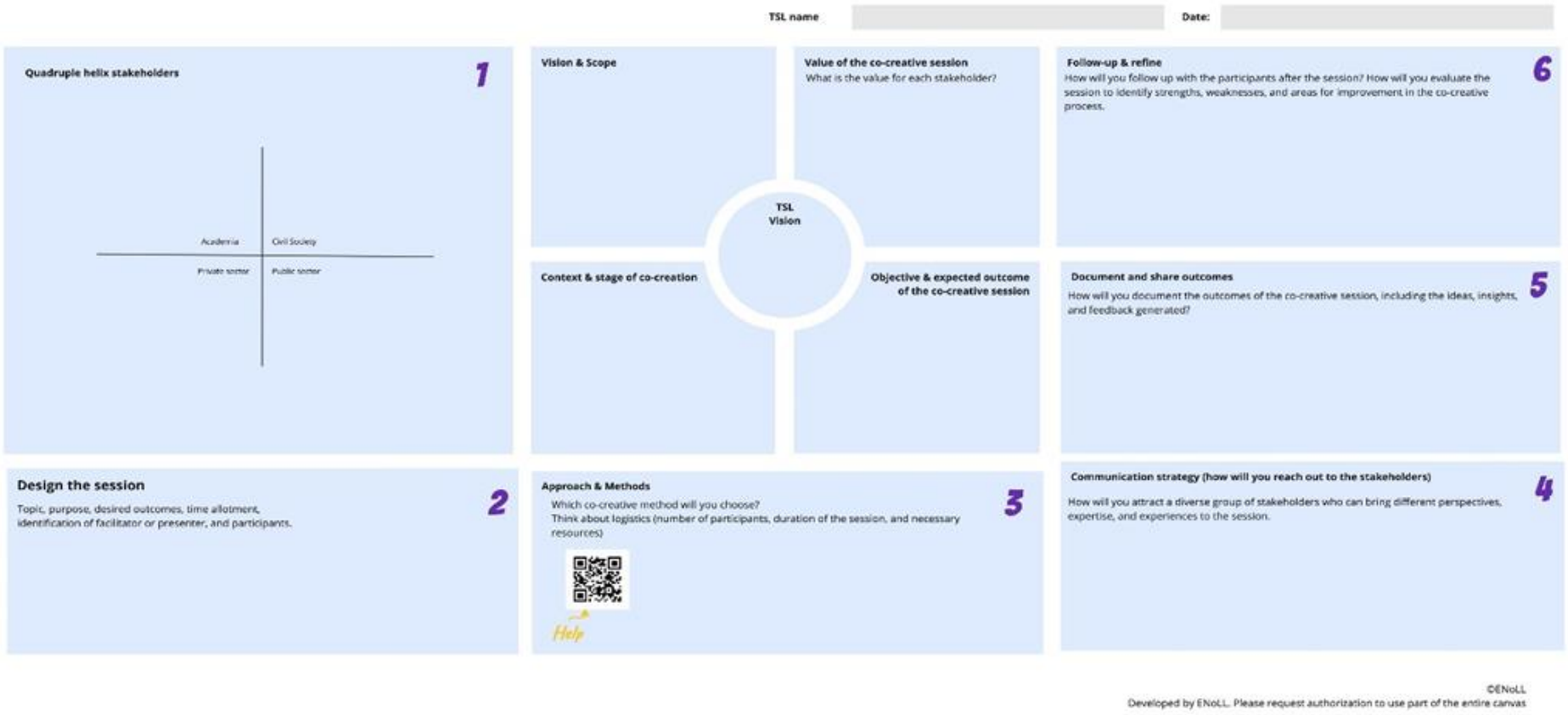

Figure 15 Co-creation workshops design canvas

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Tips on filling out the canvas

Selecting the suitable co-creation methodology is essential to achieve successful co-creation outcomes. Once the TSL vision/scope, the value of the co-creative session, the anticipated contributions, and the audience engaged in the co-creation process have been established, the next step is to identify the most suitable methodology.

Quadruple Helix Stakeholders

In this section the quadruple helix stakeholders of the TSL need to be mapped out. The stakeholders include representatives from the public sector, private sector, academia, and civil society.

Design the session

In order to design a co-creation session, various steps must be followed. These steps encompass identifying the topic, purpose, and objectives of the session. It is also crucial to carefully choose the participants, taking into consideration their diverse perspectives and backgrounds to enhance creativity. In addition, an appropriate facilitator needs to be identified for the session. The facilitator can be either an employee of the host institutions of the TSL or an external contractor.

Approach and Methods

During this step, it is important to understand necessary logistics involved with organisation of a co-creative session. This includes, number of participants expected to attend, venue where the session will be taking place and the required materials. Human resources needed to organise and facilitate the session should be taken into consideration, including subject matter experts and support staff.

It is also crucial to ensure that the selected approach/methodology is aligned with the objectives of the session and that it is in line with the needs of the participants. When deciding on an approach and methodology for a co-creative session, it is important to consider the level of involvement and engagement expected from the participants. Some sessions may necessitate an important degree of participation, with attendees actively engaging in group discussions and activities. Conversely, other sessions may require a more passive approach, with participants providing feedback on ideas already generated by others. It is recommended to consult existing co-creative methodologies. These can be found via the toolkit for co-creation, available at https://unalab.enoll.org.

Ultimately, the selected approach and methodology should be tailored to fit the specific goals, objectives, and requirements of the session. It should be meticulously planned and executed to ensure that the desired outcomes are accomplished.

Communication strategy

To invite stakeholders to participate in a co-creative session, various methods can be used, depending on the target audience and their habits. Understanding the audience is crucial in selecting the appropriate communication channel.

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In the first instance of the communication strategy, the TSL should prepare a table to map the needs of each stakeholder group alongside key messages and key channels where the group will be reached. Highlighted are some examples of how TSLs can reach out to stakeholders:

- Personal invitations: Direct email or phone calls can be used to send personalised invitations. This approach is effective for a tiny, select group of stakeholders.
- Social media: social media social media is an effective way to reach out to stakeholders for a co-creative session. TRANSFORMER project is present on LinkedIn, and Twitter and it allows easy sharing any kind of relevant information about the session, and links to a dedicated event page.
- Email invitations: Email invitations can be a direct and efficient way of reaching out to stakeholders. To ensure effectiveness, the invitation should be well-crafted and include all the necessary details, such as the date, time, location, and purpose of the co-creative session.
- Collaborative networks: Collaborative networks, such as industry associations and innovation hubs, can be valuable resources to reach out to stakeholders for a co-creative session. Such networks often have pre-existing relationships with stakeholders and can facilitate promotion of the session.
- Via trusted intermediaries: Use trusted intermediaries who are community members or have a good reputation, especially for reaching marginalized groups, to communicate relevant information in hard-to-reach areas.
- Through local media channels.

For communication purposes, all TSLs are required to use the project media library, consisting of materials for presentations, social media, document templates, online dissemination guidelines as well as designs for physical objects (posters, roll-up and business cards). Materials are prepared in the local languages of each TSL.

Document and share outcomes

Documenting and sharing the outcomes of a co-creative session is vital to ensure that the insights and ideas generated during the session are not forgotten or lost and that they are captured effectively. Multiple methods can be used to document and share the outcomes such as recordings, reports, and note-taking. The TSLs are advised to prepare a report structure in advance and gather necessary consent from the participants. The TSLs also need to be mindful of data protection regulations and should assign a Data Protection Officer.

Follow up and refine

This step is critical to maintain the stakeholders engaged on a long term and encourage their future participation in the next co-creative sessions. After a co-creative session, it is important to follow up with participants and demonstrate to them that their insights and ideas are valuable and put into action. It is essential to ask for their feedback about the session in order to identify the weaknesses and strengths of the session, as well as sharing a summary of the outcomes generated during the session. Furthermore, it is important to communicate the next steps and explain to the participants

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how their ideas and feedback that they generated during the session will be used in the future, in order to maintain transparency and continuity (Habibipour, 2019).

8 Conclusion

The contents of this deliverable delve into the process of developing a vision, forming coalitions, and engaging stakeholders within the TRANSFORMER Transition Super Labs (TSLs). It provides explicit suggestions on these topics as well as recommendations on involving citizens, particularly those who are vulnerable or marginalized, and advice on designing co-creative engagement initiatives. Through the lessons learned by the TSLs a set of recommendations is drawn up aimed at other European regions interested in implementing the TSL methodology. The coalition building process is an ongoing activity of the TSLs and further changes should be expected throughout the course of the project.

The experience gained in the four TSL regions revealed that developing a vision can be a complex exercise which often begins before the start of the project. Since the vision can be broadly defined, it is recommended for the TSLs to focus on sub-visions. Through that, the vision achievement process can be more effective and concrete. It was also observed that the vision building process must be dynamic and needs to foster experimentation. At the same time, it needs to be in line with reality and the regional context where it occurs, considering different aspects, such as the political system, the administrative organisation, the economic structure, and others.

In order to make the coalition building process representative and inclusive, it is recommended first to take into account the regional scale of TSL when identifying stakeholders, then the economic, social and cultural specificities of each sub-region or city within a region must be taken into consideration in the stakeholders mapping. After effectively identifying and understanding the stakeholders, it is crucial to develop a common vision with the identified coalition members and to ensure that they understand the common goals, values, and principles of the TSL. It is important to keep in mind that the TSL is more than just a project, it is a mission that must be carried out collectively around common regional interests. A common and solid vision then prepares the ground for a fruitful and constructive collaboration, with active participation of the members of the coalition at each stage of the development of the TSL project.

Moreover, it was observed that the involvement of civil society has been challenging for pilot TSLs. The recommendations in this report emphasize that this part of the process needs to be addressed in a specific way. First, it is important that the TSLs commit to raising awareness of climate issues among citizens and civil society using simple and accessible language. It is also crucial to show the link between the mission of the TSL and people's daily lives. Providing compensation is another key element in encouraging citizen participation in TSL activities. According to the recommendations, these compensations can be non-financial, such as visibility, the development of skills or social gatherings strengthening the links between communities around common objectives and principles.

The TSL experience has shown the importance of choosing an effective co-creation methodology to enhance and value the ideas generated by stakeholders during a project. The deliverable proposes a new methodology aiding the TSLs in the design of the co-creative sessions. The methodology describes the steps to follow to ensure an effective co-creation process, from the design of a co-creation session

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all the way to the communication strategy and refining the results of the session to their implementation. In addition, it is essential to communicate effectively and regularly with coalition members after a co-creation session and show them that their contributions are valued and put into action.

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Annexes

Annex 1 Emilia Romagna stakeholders

Public sector (Government/Institutions):
Emilia-Romagna Region institution areas
E-R ANCI National Association of Italian Municipalities
E-R Metropolitan City of Bologna (Katia Chiusaroli)
Bologna city council (Cleto Carlini)
Cesena town council
Ferrara town council
Forlì town council
Modena town council
Parma town council (Angela Chiari)
Piacenza town council
Ravenna town council (Gianluca Rizzo)
Reggio Emilia town council
Rimini town council
Province of Ferrara (Monica Zanarini)
Province of Forlì-Cesena (Giovanni Fini)
Province of Modena (Guido Calvarese)
Province of Parma
Province of Piacenza
Province of Ravenna
Province of Reggio Emilia (Paolo Gandolfi)
Province of Rimini
Zero Waste Municipalities
Mobility Manager Bologna Area
Mobility Manager Parma Area
Mobility Manager Ferrara Area
Network E-R
Confservizi E-R
UPI Union of the Provinces of Italy E-R
UNCEM National Union of Mountain Municipalities and Communities E-R

Private sector (Industry):
CUPER Unitary Committee of the Intellectual Professions of the Professional Orders and Boards E-R
E-R ANCE National Association of Builders
Regional Commission ABI E-R
Confagricoltura E-R
Confapi Emilia (Italian SME trade association)
Confapindustria E-R
Confartigianato E-R (European network representing interests and providing services to artisans and small enterprises)

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Confcommercio E-R
CGIL Italian General Confederation of Labour E-R
CIA Italian Confederation of Farmers E-R
CISL Italian Workers' Union Confederation E-R
CNA National Confederation of artisans and small and medium enterprises E-R
COPAGRI Confederation of Agricultural Producers E-R
Confesercenti Confederation of small and medium enterprises E-R
Confimi Romagna Confindustria E-R
Confindustria Emilia area centro
Confprofessioni E-R
UGL General Union of Labour E-R
UIL Italian Union of Labour E-R
Unioncamere E-R
Unione Parmense degli Industriali
BE Charge S.r.l (Roberto Colicchio)
IREN Mercato S.p.A (Liardo Cristiano)
Hera Comm S.r.l (Stefano Cardillo)
Enermia Srl (Flavia Samori)
Enel X Mobility srl (Massimiliano Bega)

Civil society:
AGCI General Association of Italian Cooperatives
Coldiretti Emilia-Romagna (Emilia-Romagna farmers' association)
Confcooperative E-R
Italian Federation Environment and Bicycle (FIAB) (Nevio Senni)
Third-Sector Forum E-R
Legacoop E-R
Legambiente E-R (envronment association) (Paola Fagioli)
Associazione Salvaciclisti Bologna

Academia/Universities:
National Research Council (CNR)
Regional School Office E-R
Catholic University of the Sacred Heart
University of Bologna (Annalisa Zoli and Margherita Pazzini)
University of Ferrara
University of Modena and Reggio
University of Parma

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Annex 2 Lower Silesia stakeholders

Public sector (Government):
City of Lubin
City Polkowice
District (Starosty) Lubin
Lower Silesian Voivodeship

Private sector (Industry/business):
DFR (Lower Silesian Development Fund)
Infra – Counselling centre - responsible for the design of railway lines
Lower Silesian Railways

Academia:
University of Warsaw
Institute for Territorial Development –

Civil Society:
Dumni z Lubina Foundation
Legnica Hydrogen Cluster

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Annex 3 Ruhr Area stakeholders

Public sector (Government):

Essener Wirtschaftsförderungsgesellschaft mbH
Essener Wirtschaftsförderungsgesellschaft mbH
Hy.Region.Rhein.Ruhr e.V.
Wirtschaftsförderung Dortmund
Stadt Dortmund
Bochum Wirtschaftsentwicklung
H2 Niederrhein Kreis Wesel
Wasserstoffallianz Westfalen
Herne Business
Wissenschaftspark Gelsenkirchen
Amt für Wirtschaftsförderung und Standortmanagement der Stadt Bottrop
WiN Emscher Lippe GmbH
Wasserstoff Anwenderzentrum Herten
Regionalverband Ruhr
Regionalverband Ruhr
Emschergenossenschaft Lippeverband

Private sector (Industry/business):

Niederrheinische Industrie- und Handelskammer
Duisburg-Wesel-Kleve zu Duisburg
Niederrheinische Industrie- und Handelskammer
Duisburg-Wesel-Kleve zu Duisburg
Industrie- und Handelskammer für Essen, Mülheim an der Ruhr, Oberhausen zu Essen
Industrie- und Handelskammer zu Dortmund
Industrie- und Handelskammer zu Dortmund
Industrie- und Handelskammer Nord Westfalen
Industrie- und Handelskammer Nord Westfalen
Industrie- und Handelskammer Mittleres Ruhrgebiet
Südwestfälische Industrie- und Handelskammer zu Hagen
Handwerkskammer Dortmund
Der Mittelstand, BVMW e.V.
ZINQ Technologie GmbH
MAN Energy Solutions

Academia:

Fraunhofer-Institut für Umwelt-, Sicherheits- und Energietechnik UMSICHT
Fraunhofer-Institut für Umwelt-, Sicherheits- und Energietechnik UMSICHT
Gas- und Wärmeinstitut Essen
Westfälische Hochschule
Gas- und Wärmeinstitut Essen
Zentrum für Brennstoffzellentechnik
Ruhr-Universität Bochum

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Ruhr-Universität Bochum

Civil society:
Deutscher Gewerkschaftsbund NRW
Deutscher Gewerkschaftsbund Region Emscher-Lippe
IGBCE Stiftung Arbeit und Umwelt
NABU NRW

Public-private:
H2-Netzwerk Ruhr e.V.
Rhein Ruhr Power e.V.
HyDROP
H2Hub
SPIN – Spitzencluster für industrielle Innovation e.V.

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Annex 4 Western Macedonia stakeholders

Full list of stakeholders for 1st pathway

Stakeholder	Field of Activity	Potential Contribution
Bus Private Company - Public Transport of Regional Unit of Kozani	Inter-city bus operator	Beneficiary of buses based multimodal electrified modes operation
Bus Private Company - Public Transport of City of Kozani	Urban-city bus operator	Beneficiary of buses based multimodal electrified modes operation
Bus Private Company - Public Transport of City of Ptolemaida	Urban-city bus operator	Beneficiary of buses based multimodal electrified modes operation
Regional Authority - Regional Unit of Kozani	Administrative Body - Decision maker	Host and funder of power storage stations
Local Authority - Municipality of Kozani	Administrative Body - Decision maker	Host and funder of power storage stations
Local Authority - Municipality of Eordaia	Administrative Body - Decision maker	Host and funder of power storage stations
Local Authority - Municipality of Voio	Administrative Body - Decision maker	Host and funder of power storage stations
Local Authority - Municipality of Servia	Administrative Body - Decision maker	Host and funder of power storage stations
Local Authority - Municipality of Velvento	Administrative Body - Decision maker	Host and funder of power storage stations
Technical Chamber of Greece - Department of W. Macedonia	Scientific chamber - Technical expert & consultant	Communication among its members and contribution in optimization of multiple electric power storage solutions & buses based multimodal electrified modes operation in region's public transport
University of W. Macedonia - Department of Mechanical Engineering	Academic body - Research and Technology expert	Contribution in optimization of multiple electric power storage solutions & buses based multimodal electrified modes operation in region's public transport
Public Power Corporation Renewables (PPCR) SA	PPCR inherited all Renewable Energy Source (RES) related activities (wind, small hydroelectric, solar and geothermal) from Public Power Corporation SA,	Provider of Electric power storage solutions including all its technological innovation, know-how and expertise in the field of power generation

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	Greece's largest power generation company	
Hellenic Electricity Distribution Network Operator (HEDNO) S.A.	Operation, maintenance and development of the power distribution network in Greece	Distribution of multiple electric power storage solutions & buses based multimodal electrified modes operation in region's public transport
Union of Investors in Photovoltaics in W. Macedonia Region	Representation of producers of small-scale electric power coming from Photovoltaics	Provider of Electric power, coming from Photovoltaics, storage solutions
Cluster of Bioeconomy and Environment (CLuBE) of Western Macedonia	Development of synergies between local and regional players and businesses in bioenergy and the environment, aiming at introducing and developing innovation in the sector and increasing its added value	Clustering of providers and Promotion of Biofuels (include bioethanol, biodiesel, biogas, biomethanol, oxydimethyl ether, synthetic biofuels, bio-hydrogen and pure vegetable oils) in multiple electric power storage solutions
Municipal Police of Kozani	Traffic control in Kozani	Allocation of power storage stations in the city
Municipality Police of Ptolemaida	Traffic control in Ptolemaida	Allocation of power storage stations in the city

Full list of stakeholders for 2nd pathway

Stakeholder	Field of Activity	Potential Contribution
Cluster of Bioeconomy and Environment of Western Macedonia (CLuBE)	Development of synergies in bioenergy and environment, introducing and developing innovation and increasing added value	Clustering and support in Supply Chain Management (CMS) of a network of agri-food companies involved in CO2 capture & CO2 emission reduction technologies
Waste Management of W. Macedonia Region (DIADYMA) SA	Waste Management Agency, Management Body of the forthcoming Circular	Hosting enterprises and research units involved in CO2 capture & CO2 emission reduction technologies in the forthcoming

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	Economy Park of W. Macedonia	Circular Economy Park of W. Macedonia
University of W. Macedonia - Department of Agriculture	Academic body - Research and Technology expert	Contribution in CO2 capture & CO2 emission reduction technologies for green and fair agri-food supply chains
Geo-Technical Chamber of Greece - Department of W. Macedonia	Scientific chamber - Technical expert & consultant	Communication among its members and contribution in CO2 capture & CO2 emission reduction technologies
Economic Chamber of Greece - Department of W. Macedonia	Scientific chamber - Technical expert & consultant	Communication among its members and contribution in forms of agri-food supply chains
Technical Chamber of Greece - Department of W. Macedonia	Scientific chamber - Technical expert & consultant	Communication among its members and contribution in CO2 capture & CO2 emission reduction technologies
Bisiritsas Brothers Farm SA - Private agri-food company	Local meat farm	Beneficiary of CO2 capture & CO2 emission reduction technologies for green and fair agri-food supply chains
Cluster of innovation Internet of Food Alliance (InoFA)	Connecting all the links of the agri-food chain and those who provide materials and services to it under a common umbrella which is based on high technology and the Internet of Things.	Promoter and Beneficiary of CO2 capture & CO2 emission reduction technologies for green and fair agri-food supply chains
Proud Farm - sheep and goat farming	Development of new technologies and creation of alternative models of sheep and goat feeding	Beneficiary of CO2 capture & CO2 emission reduction technologies for green and fair agri-food supply chains
Arosis - legume and rice farming	Production and packaging of biologival legume and rice	Beneficiary of CO2 capture & CO2 emission reduction technologies for green and fair agri-food supply chains
Rural Cooperative Producers Organisation “Dimitra” (A.S.O.P.)	Cultivation, harvesting, packing and distribution of fresh fruits.	Beneficiary of CO2 capture & CO2 emission reduction technologies for green and fair agri-food supply chains

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Full list of stakeholders for 3rd pathway

Stakeholder	Field of Activity	Potential Contribution
Regional Development Agency of W. Macedonia (ANKO) SA	Development Organisation of Local Self-Government - Regional and local development policy planning and implementation	Host of the Living Lab, co-ordinator of an MoU among stakeholders for the scopes and the operation of the Living Lab
Local Authority - Municipality of Kozani	Administrative Body - Decision maker	Beneficiary of the facilitation of the digital transition of the city
Regional Authoriy - Regional Unit of Kozani	Administrative Body - Decision maker	Endorsement of incorporation of circular economy in Smart Urban Mobility & digital economy implementation in policy and programming documents and funds
REGIONAL DEVELOPMENT FUND (RDF) OF W. MACEDONIA	Administrative Body - Funding Authority	Endorsement of incorporation of circular economy in Smart Urban Mobility & digital economy implementation in regional funds
Centre for Research and Technology-Hellas (CERTH)	Research Centre - Climate change, sustainable energy, artificial intelligence, advanced robotics, Internet of Things, holistic approaches to healthcare and nutrition, autonomous vehicles smart cities of the future and circular economy, are the primal fields around which CERTH's five (5) institutes are organized	Scientific expert of the Living Lab
Cluster of Bioeconomy and Environment of Western Macedonia (CLuBE)	Development of synergies in bioenergy and environment, introducing and developing innovation and increasing added value	Clustering and support in incorporation of circular economy in Smart Urban Mobility & digital economy implementation

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Waste Management of W. Macedonia Region (DIADYMA) SA	Waste Management Agency, Management Body of the forthcoming Circular Economy Park of W. Macedonia	Hosting enterprises and research units facilitating the incorporation of circular economy in Smart Urban Mobility & digital economy implementation (cocreation & codesign)
University of W. Macedonia - Department of Mechanical Engineering	Academic body - Research and Technology expert	Contribution in cocreation & codesign in Smart Urban Mobility & digital economy implementation
Technical Chamber of Greece - Department of W. Macedonia	Scientific chamber - Technical expert & consultant	Contribution in cocreation & codesign in Smart Urban Mobility & digital economy implementation
Geo-Technical Chamber of Greece - Department of W. Macedonia	Scientific chamber - Technical expert & consultant	Contribution in cocreation & codesign in Smart Urban Mobility & digital economy implementation
Economic Chamber of Greece - Department of W. Macedonia	Scientific chamber - Technical expert & consultant	Contribution in cocreation & codesign in Smart Urban Mobility & digital economy implementation
Chamber of Kozani	Chamber of Commerce	Contribution in incorporation of circular economy in Smart Urban Mobility & digital economy implementation among its members (SMEs)
Bus Private Company - Public Transport of City of Kozani	Urban-city bus operator	Endorsement of Smart Urban Mobility

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Annex 5 First Preliminary Assessment of Emilia Romagna

The main strengths identified were:

- Innovations in actions and initiatives tackling climate issues
- Several regional plans to improve air quality (e.g., transport, energy, and waste plans)
- SUMPs and SECAPs in place
- Strong engagement of civil society

Weaknesses:

- Public debate too polarised
- Lack of coordination between regional, national and EU policies
- Not clear integration with ESG
- Lack of clear and targeted communication

Opportunities:

- Increasing collaboration between different stakeholders
- Collaboration with research institutions
- Recovery Plans to support the economic changes
- Possibility to enhance the awareness in young generation

Threats:

- Implemented actions having limited impacts
- Lack of awareness in daily behaviour
- Costs/benefits of changes for final users of new mobility infrastructures or services

The exercise confirmed that there is a great need of coordination among all quadruple helix stakeholders and integration as well as harmonisation among the different policies and initiatives adopting a cross-sectoral approach. In particular, it is necessary to improve the impact of the implemented actions and to raise awareness in daily behaviour to all quadruple helix stakeholders' groups.

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Annex 6 First Preliminary assessment of Lower Silesia

The discussion between the members of the Lower Silesia TSL team highlighted the need of bringing together the local ecosystem and the stakeholders of the quadruple helix from different sectors. The members of the Lower Silesia TSL team agreed that a special feature of the LGOM region is the very high energy demand. However, in response to this high demand for energy, different views on energy transition should be carried out.

Strengths:

- Highly skilled workers
- Low unemployment
- High Salaries

Weaknesses:

- Economic dependence on the mining sector
- Extremely high energy demand
- Dependence on road transport

Opportunities:

- Plan to create “Hydrogen Valley” in Lower Silesia
- Widely discussed need for alternative energy sources
- The mining sector looking for new energy sources

Threats:

- Coal-dependent energy production
- Economic slowdown

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Annex 7 First Preliminary assessment of the Ruhr Area

Strengths:

- Scalability
- Well-developed energy infrastructure
- High density of university and research institutes
- Experience in Hydrogen and transition activities
- Large market
- Acceptance of transition projects by society
- Large firms pushing for hydrogen

Weaknesses:

- Ruhr is an energy import region and there is no good way to produce green energy within the region
- High Energy consumption, especially in the industrial sector. This was accelerated due to the energy crisis experienced since 2021
- Difficult governance structure with a polycentric structure
- Difficult modal split in transportation where structures are not aligned

Opportunities:

- European Green Deal
- European backbone (hydrogen pipeline) plans
- Current energy crisis is an opportunity to get various stakeholders on board for a quick change

Threats:

- Lack of renewable energies and a supply dependence on other regions
- Supply chain uncertainties
- Technological uncertainties
- Lack of regulations, which are external to the region

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Annex 8 First Preliminary assessment of Western Macedonia

The discussion between the members of the Western Macedonia TSL team highlighted the need to bring together the local stakeholders of the quadruple helix from different sectors. This will prevent the development of sector-based action plans that are currently used in Western Macedonia and guide the strategy of the region to a more holistic approach. It is also important to involve in the TSL the stakeholders whose decisions may have more impact in the achievement or the non-achievement of the region's objectives towards climate neutrality as well as to enhance the dynamic of the new generation.

Strengths:

- Energy based economy and energy value chain (high expertise of human resources, well developed energy infrastructure and know how related to energy activities)
- Conscience of the actors in changing the plan towards climate neutrality. There is a plan to abandon lignite-based energy production.

Weaknesses:

- Focus of the Energy based economy on carbon fuels
- 40% of the GDP is coming from the energy sector
- Low economic diversification

Opportunities:

- TSL can contribute to economic diversification
- Change can be done by carbon-neutral transportation and carbon neutral energy production
- Bottom-up process can be implemented with cross innovation approaches
- TSL can bring together the local ecosystem and stakeholders from different sectors
- Speeding up the process

Threats:

- No regional plan in place for climate transition
- Actual plans are more sector-based and less holistic
- Stakeholders from the "old economy" can veto plans

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