



Project deliverable D4.1

# SOCIAL ENGAGEMENT STRATEGY

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## LIST OF ABBREVIATIONS AND ACRONYMS

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Acronym	Meaning
<b>ASAP</b>	As Soon As Possible
<b>B2B</b>	Business-to-business
<b>B2C</b>	Business-to-Consumer
<b>BIM</b>	Building Information Modelling
<b>DH</b>	District Heat
<b>DT</b>	Digital Twin
<b>EC</b>	European Commission
<b>FCs</b>	Follower Cities
<b>GA</b>	Grant Agreement
<b>IAP</b>	Integration Assessment Platform
<b>KoM</b>	Kick-off Meeting
<b>KPIs</b>	Key Performance Indicators
<b>LH</b>	Light House
<b>TIPS4PED</b>	Turning cities Planning actionS for Positive Energy Districts
<b>PEDs</b>	Positive Energy Districts
<b>WP</b>	Work Package
<b>NGO</b>	Non-Governmental Organization

## PROJECT EXECUTIVE SUMMARY

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TIPS4PED will design, develop, and test in a relevant environment the effectiveness and the techno-economic viability of a Digital Twin based Platform, to support municipalities in the implementation of Positive Energy Districts. The TIPS4PED Platform will be able to support municipalities in the decision-making delivering a series of evidence-based results, increasing the environmental sustainability of cities, and reducing operational costs. The project will adopt a people-centric approach, which aims at engage, train and empower citizens and potential stakeholders. TIPS4PED will do this by leveraging on consortium knowledge and prior EU experience and being motivated by the goals set forth by the European Commission.

To design and manage the PED effectively and foster its implementation through city planning actions, different modules will be made available on the Integrated Assessment Platform, to support municipalities from the technical perspective, as well as the social, financial, regulatory and administrative ones. The tools will be developed thanks to a end-users co-design approach, capable of providing constant feedback to the software development process.

The TIPS4PED solutions will be tested in one Light House city (Turin), where the Integrated Assessment Platform (IAP) will be connected to a sensing system for the real time management of the assets, and replication studies will be conducted in three Follower Cities (Cork, Kozani and Budapest). The testing and replication phase will result in the creation of 4 cities Digital Twins and decarbonization roadmaps. TIPS4PED seeks to suggest scalable and easily reproducible technologies and digital optimization as a key solution for to achieve 2030 EU goals, while taking into consideration various market circumstances, and environmental, safety, and regulatory aspects.

Social Media links:

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For further information please visit [WWW.TIPS4PED.EU](http://WWW.TIPS4PED.EU)

## DELIVERABLE EXECUTIVE SUMMARY

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The TIPS4PED project's Social Engagement Strategy, establishes a comprehensive framework for effectively engaging stakeholders in the design and creation of a PED. At its core, the strategy emphasizes inclusivity, transparency, and collaboration to maximize the benefits of innovative digital twin technologies across four European pilot cities: Turin, Cork, Budapest, and Kozani.

The project's key components include enhancing regional planning, fostering citizen participation, advancing sustainability, and developing real-time monitoring and management tools. All these rely heavily on a robust Social Engagement Strategy. This strategy aims to raise awareness about the digital twin initiative, inform communities of its benefits and encourage active participation in data collection. Additionally, it fosters transparency and ownership and promotes collaborative decision-making. Central to this strategy is the identification and engagement of diverse stakeholder groups, including policymakers, local authorities, businesses, NGOs, academia, and citizens. Through stakeholder mapping and analysis, the project has successfully categorized and assessed the influence and interests of these groups, enabling tailored engagement approaches that address the unique needs and dynamics of each pilot site.

To empower communities, various engagement activities are developed. Some examples are workshops, focus groups, newsletters, and digital platforms, complemented by long-term strategies including regular reviews, open communication channels, and adaptive engagement methodologies. These activities enable stakeholders to co-create and refine the Integrated Assessment Platform (IAP), the project's cornerstone for enabling cities to implement PED solutions.

Innovative engagement methods, including gamification techniques and participatory workshops, have been employed to simplify complex technical concepts and foster collaboration. These tools empower stakeholders to actively contribute to project development, ensuring alignment between technical goals and community needs. Effective communication channels, such as social media, newsletters, and public meetings, ensure transparent dissemination of information and foster meaningful dialogue with a broad audience.

The strategy incorporates a robust monitoring and evaluation framework, with Key Performance Indicators (KPIs) to measure stakeholder participation, event success, and communication outreach. Regular assessments ensure adaptability and alignment with project objectives, enabling continuous improvement of engagement processes.

By placing people at the center of its mission, TIPS4PED demonstrates the critical role of social engagement in achieving climate-neutral and sustainable urban development. The strategy not only supports the technical and operational goals of the project but also contributes to a broader vision of fostering smart cities and empowering communities across Europe. Lessons learned and best practices developed through this initiative will serve as a replicable model for the deployment of Positive Energy Districts, advancing the European Union's climate and energy goals while creating resilient and inclusive urban environments.



# 1 PURPOSE OF THE DELIVERABLE

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## 1.1 Attainment of the objectives and explanation of deviations

The objective of this deliverable is to provide a comprehensive guideline for the effective engagement of diverse stakeholders in the successful implementation of the project. As outlined in Task 4.1 “Social Engagement Strategy”, the active involvement of the local stakeholders community is critical for the development of the IAP. To achieve this, it is essential not only to ensure accurate and clear communication with stakeholders but also to effectively convey the tangible benefits that the project will deliver to their respective areas. This approach is essential to building trust and enthusiasm, and as such fostering meaningful collaboration.

Given that the project spans four pilot sites –comprising one Lighthouse (LH) site and three Follower Cities (FCs) – the stakeholder engagement strategies must accommodate the diverse categories of stakeholders, regional contexts, and specific local needs. While outreach methods may vary across the pilot sites, the ultimate goal remains consistent: to effectively increase awareness and participation, cultivate a sense of community and collaboration, and promote sustainable, long-term engagement. This document provides a detailed, step-by-step roadmap for pilot leaders to achieve these objectives.

Additionally, this Social Engagement Strategy recommends tailored methods and tools for each pilot site, such as interactive online platforms, community surveys, localised media campaigns, and targeted outreach to specific stakeholder groups such as local businesses, public authorities, and NGOs. By leveraging these diverse approaches, pilot leaders can address the unique challenges and opportunities within each site, ensuring the alignment of stakeholder expectations and project goals.

## 1.2 Intended audience

The intended audience of this deliverable includes all consortium partners actively participating in the pilot sites. In particular, the pilot leaders and their supporting partners who play key roles in coordinating and managing the pilots, should be able to rely on this document for tailored tools and associated focused actions.

However, the document's relevance extends beyond the immediate pilot teams. Other consortium partners can leverage the insights and methodologies outlined in this document to enhance their engagement methods in other projects or for further professional development. By providing a structured approach to stakeholder engagement, this deliverable serves as a valuable resource for fostering collaboration, enhancing outreach strategies, and driving long-term impact.

## 1.3 Structure of the deliverable and links with other work packages/deliverables

The document is structured to guide readers through a clear and comprehensive framework for stakeholder engagement and the integration of social strategies into project implementation. It introduces the overarching goals of the social engagement strategy, emphasising the importance of community participation in enhancing regional planning and deploying digital twin technologies. The **Introduction** (Section 2) provides

an in-depth look at the concept of digital twins and their application within the TIPS4PED project. It elaborates on the project's objectives, including the development of an IAP and its implementation across four European pilot cities. This contextualizes the need for a robust engagement strategy by highlighting how stakeholder collaboration can address challenges and optimise project outcomes.

The core chapters are organized to methodically address different facets of engagement. The **Stakeholder Mapping and Analysis** (Section 3) section explores methodologies for identifying and understanding stakeholder groups, providing practical examples from the pilot sites. The subsequent chapter on **Co-Creation Methodology** (Section 4) focuses on collaborative approaches, highlighting the importance of active participation and iterative feedback to align with stakeholder needs.

Moving on, the **Stakeholder and Citizen Engagement Strategy** (Section 5) section outlines step-by-step approaches, communication channels, and tools tailored for effective outreach. It includes specific recommendations for engagement activities and campaigns, such as focus groups, surveys, and public workshops, while addressing the integration of technology and sustainability initiatives like the New European Bauhaus.

Finally, **Monitoring methods** (Section 6) are proposed, providing guidelines for tracking engagement effectiveness through Key Performance Indicators (KPIs) and adaptive strategies. The Conclusion summarises lessons learned and proposes actionable next steps for refining future engagement efforts, ensuring long-term success and sustainability in similar projects.

## 2 INTRODUCTION

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In an era where technology seamlessly integrates with urban development, the concept of a "digital twin" has emerged as a ground-breaking tool in city planning and management. A digital twin is a virtual model that precisely mirrors a physical object or environment, combining real-time data and digital technology to create dynamic simulations. One of the key benefits of using the digital twin in manufacturing is the ability to make intelligent and informed decisions. The vast amount of data generated and collected by the digital twin provides valuable insights that can optimise processes, reduce waste, enhance sustainability, and save costs.

The TIPS4PED Project aims to develop an IAP to support cities in the decision-making process, enabling the design, development and optimised management of PEDs of DTs. TIPS4PED places decision-makers and citizens at the heart of the climate neutrality actions and proposes a user-oriented decision-making approach for the development of tools and solutions. The project focuses on the development of DTs in four different European regions, namely Turin/Italy, Cork/Ireland, Budapest/Hungary and Kozani/Greece. Turin/Italy is the project's Light House (LH), whereas the three other cities will follow, developing and testing similar models.

DTs can monitor and adjust design in real-time, identifying and resolving potential stakeholder concerns before they arise. By linking the physical and digital realms, stakeholders can be guided through the design and delivery process in an integrated and understandable way, allowing for richer engagement and better outcomes. The engagement of distinct stakeholders' groups from the very early stages of the process is expected to enrich the co-planning and co-design processes. Working and thinking collaboratively can enable the pilot leaders to explore different possibilities through visualisation, think creatively about a range of solutions, and assess their anticipated effect.

### 2.1 The power of Engagement and Collaboration

Engagement and collaboration are powerful forces that drive innovation, build resilience, and achieve shared goals. By bringing together diverse perspectives, skills, and experiences, collaboration fosters creativity and enables solutions that are greater than the sum of their parts. Engagement ensures that all voices are heard, cultivating trust and mutual understanding while empowering individuals to contribute meaningfully. Together, these dynamics create a foundation for lasting partnerships, inspire collective action, and generate impactful outcomes.

## 2.1.1 Defining Social Engagement

Social engagement is basically the process of actively involving individuals, groups, or communities in meaningful interactions, dialogues, and activities that foster collaboration, understanding, and collective actions. Usually, it focuses on building relationships, encouraging participation, and creating opportunities for people to contribute their ideas, perspectives, and resources toward shared goals. Furthermore, it is considered as a cornerstone of decision-making models, as it goes beyond merely informing and/or consulting. Rather, it is an interactive process that actively engages key, affected and/or interested stakeholders in local energy planning decisions. For successful social engagement, the following steps (represented in Figure 1) should be established:

- **Define clear goals and targets of the project**  
Identify specific objectives for social engagement, such as raising awareness or increasing participation, and align them with the TIPS4PED project milestones. Ensure the goals are measurable and tailored to the needs of PEDs.
- **Identify target audience**  
Categorise stakeholders into key groups, such as public authorities, citizens, businesses, and NGOs. Understand their demographic and cultural contexts as well as their current and future concerns to customise engagement approaches effectively.
- **Conduct a community/stakeholder assessment and provide incentives for their participation**  
Use surveys, focus groups, and workshops to assess stakeholder needs, concerns, and expectations. Address participation barriers like digital literacy gaps and incentivise engagement through recognition or capacity-building activities.
- **Determine appropriate stakeholder engagement methods as will be described later in Chapter 5.3**  
Select suitable tools, such as public meetings, workshops, and online platforms, tailored to stakeholder preferences. Ensure inclusivity by involving diverse groups, including underrepresented communities.
- **Communicate and seek feedback from stakeholder groups.**  
Establish clear communication channels and foster two-way dialogues to make them feel more involved and important for the implementation of the project. Incorporate their feedback into project decisions to build trust and ownership.
- **Develop an Action Plan**  
Define specific actions, responsibilities, and timelines for engagement activities. Align the Plan with project phases and allocate necessary resources for its execution.
- **Continuous Monitoring and Evaluation of the results**  
Track engagement using KPIs such as participation rates and feedback quality. Evaluate progress on a regular basis, share outcomes transparently, and adapt strategies based on stakeholder responses and project needs.

The TIPS4PED Project is closely aligned with the concept of social engagement, reflecting its commitment to sustainable decision-making processes that engage and involve all stakeholders. It emphasises the importance of involving communities in decision-making, particularly in areas like local energy planning and sustainability.

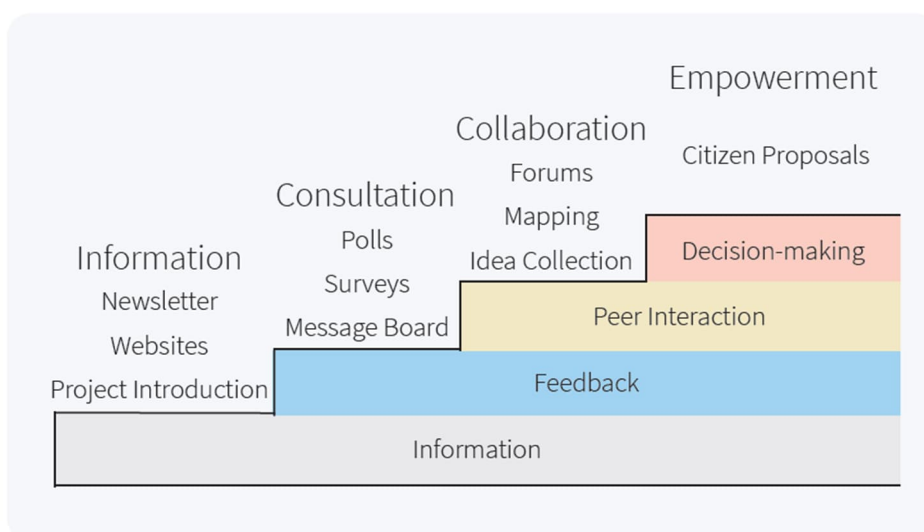


Figure 1: Steps for successful engagement and collaboration

## 2.2 Advantages and challenges

Social engagement is a powerful tool that offers numerous advantages on both individual and collective levels. It fosters a sense of belonging and community, reducing isolation and enhancing mental well-being. By encouraging the exchange of ideas and diverse perspectives, it drives creativity, problem-solving, and innovation. Social engagement strengthens networks, enabling individuals and organizations to collaborate effectively and build mutual support. It cultivates empathy and understanding, creating more inclusive communities while amplifying voices and promoting positive change. Ideally, this process empowers people to become changemakers, influence decisions, and address societal challenges, enriching the scope of projects and making them more relevant to a wider audience. As a result, tested solutions are more socially accepted, perhaps even looked upon with pride, and compliance of individuals as well as businesses increases. However, social engagement also presents challenges that must be carefully managed to ensure its effectiveness. Overcoming barriers to participation, such as cultural differences, language, accessibility issues, or lack of resources, is crucial to fostering meaningful and equitable involvement. Managing differing opinions, values, and beliefs can lead to conflicts or misunderstandings, requiring careful mediation to avoid mistrust. Sustaining engagement long-term often demands significant time and resources, as maintaining interest, motivation, and momentum can be difficult. Careful planning and coordination are essential to address the needs and expectations of all parties involved, avoiding potential delays while enhancing transparency, communication, and trust. Despite these challenges, the benefits of social engagement, including stronger community bonds and increased motivation and commitment, make it a vital component of successful initiatives.

## 3 STAKEHOLDERS MAPPING & ANALYSIS

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### 3.1 What is stakeholder mapping

A stakeholder is any person, group, or organisation that is affected by (or has an impact on) a project, organisation, or work. Stakeholder mapping is the process of identifying and analysing various individuals, groups and organisations that may have an interest or influence in a project. It involves understanding their roles, interests, power dynamics and relationships. Plotting their attributes on a chart to facilitate data visualisation, enables more effective comparison of different stakeholders, and it enhances the analysis of the stakeholders based on the attributes they have to offer. Stakeholder mapping is an essential element of the stakeholder analysis process, which plays a key role in planning, engagement and management efforts.

Stakeholder mapping involves categorising stakeholders based on specific attributes or levels that define their relationship to the project. For instance, stakeholders can be classified according to their impact on the project's evolution. In the TIPS4PED project, those who share their needs and provide feedback for the development of the IAP are pivotal during the project's development phase, whereas local authorities play a more significant role in utilising the platform after the project's completion. The methods and outcomes of stakeholder mapping depend on the specific models employed. This approach enables a more accurate assessment of the relative position of individual stakeholders, the identification of trends and the grouping of stakeholders according to shared characteristics.

Mapping the relevant stakeholder groups is a crucial part of developing an effective engagement plan. It should be one of the initial actions since it allows identifying the most appropriate way to engage with each group, ensuring that resources are used efficiently. It enables focusing on those groups with the most interest and influence, while minimising unnecessary setbacks with groups that do not require as much attention. In Figure 2: Stakeholder classification poster provided by LINKS for the focus groups stakeholder categorisation is presented which helps to classify the stakeholders based on the following criteria:

- Low Interest and Low Influence: Stakeholders in this category generally require minimal engagement. One-way communication, providing essential updates, will usually be enough.
- Low Interest and High Influence: Although not highly interested in ongoing communication, this group holds significant influence. It is important to keep them informed of key developments and monitor their potential needs or concerns.
- High Interest and Low Influence: While these stakeholders lack major influence, their high level of interest makes regular, more detailed communication valuable. Two-way communication should be considered to keep them engaged.
- High Interest and High Influence: These are key stakeholders who hold both significant interest and influence. Engaging this group should be a priority, requiring regular, two-way communication to address their concerns and maintain strong relationships.



Figure 2: Stakeholder classification poster provided by LINKS for the focus groups

### 3.2 Understanding Stakeholder Analysis

While the concept of analysing stakeholders is similar to mapping, the key difference lies in their purpose and application. Stakeholder mapping serves as a “tool” to visually and systematically represent the stakeholder environment, including their roles, relationships, and power dynamics. Conversely, stakeholder analysis builds upon mapping and focuses on evaluating the characteristics, motivations, and needs of stakeholders to inform targeted engagement strategies. In stakeholder management, "interest" refers not only to curiosity or involvement but also to a stakeholder's legal or rightful entitlement to be involved or consulted. For instance, in infrastructure projects, this could involve issues such as property ownership, leases or regular use of a site. Furthermore, stakeholders may have cultural, social, or historical ties to an area, which gives them a vested interest in the project area. In contrast, influence refers to the extent to which a stakeholder can impact the project's outcomes. The level of influence, sometimes referred to as "power", varies among stakeholders. Some stakeholders are able to directly influence decisions, processes, or the direction of the project due to their role, position, or authority. Understanding how a project impacts stakeholders is also critical. For instance, some stakeholders may experience changes in their daily routine especially on the time needed or means of transport used to arrive in the city center

### 3.2.1 The value of Stakeholder Analysis

A comprehensive stakeholder analysis is an essential foundation for effective stakeholder management and engagement strategies. It enables the identification, comprehension and organisation of stakeholders in a manner that optimises engagement efforts. The following outlines how stakeholder analysis can enhance the process:

- *Understanding stakeholder motivations*, to proceed with a thorough analysis of their beliefs, values and demographics that drive their decisions. This way the overall communication strategies could be enhanced, allowing for more tailored made approaches.
- *Prioritising key issues*, by determining which concerns are more significant and to which specific groups. This process could allow for a more focused approach on critical areas like environmental or social impacts.
- *Categorising stakeholders*, to cope with large numbers of stakeholders, i.e. smaller, more manageable groups. This allows for the creation of customised communication and engagement strategies, tailored to the specific requirements and interests of each group.
- *Justifying resource needs*, as this data provides a robust basis for requesting additional support when necessary.

### 3.2.2 Stakeholder Analysis: Insights from the TIPS4PED Project workshop

A workshop was conducted among the TIPS4PED project partners in Lappeenranta, during which participants were divided into four groups and answered questions related to stakeholders in the context of the project. Two of the questions focused on stakeholder analysis, while the remaining questions focused on the engagement strategy, which is presented in the relevant chapter. The results and conclusions drawn from the most prominent answers are presented below (see Figure 3 and Figure 4):

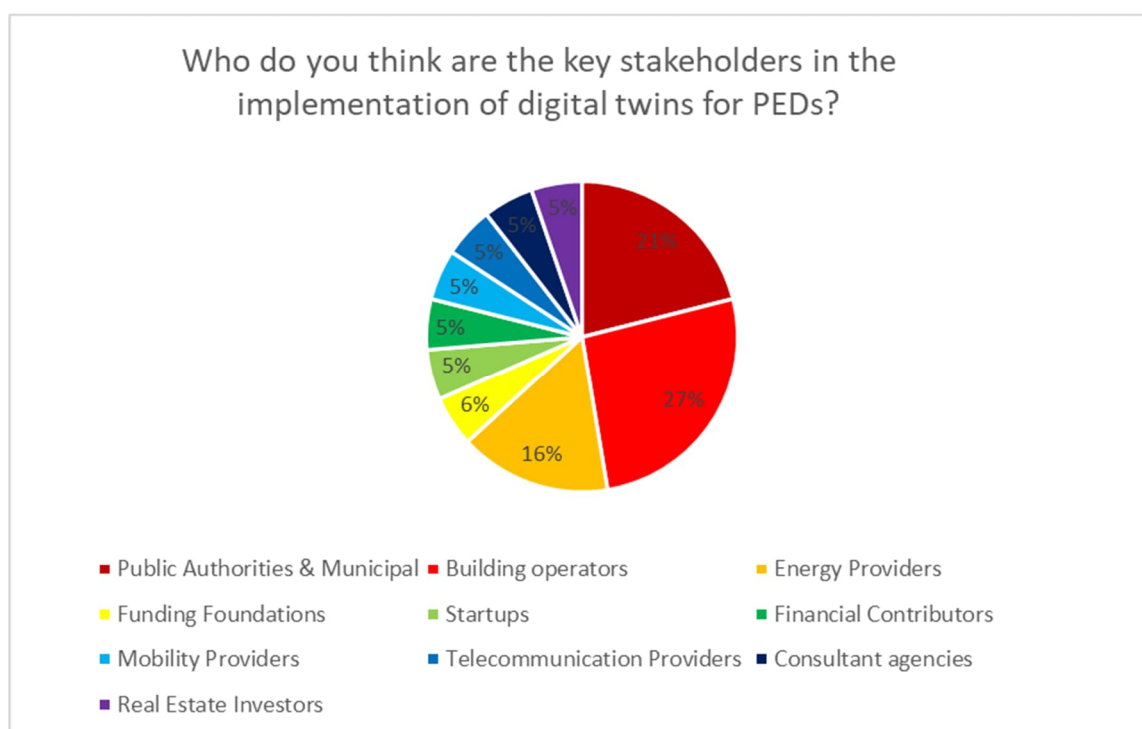


Figure 3: Response to the question “Who do you think are the key stakeholders in the implementation of digital twins for PEDs?” from the workshop in Lappeenranta



Given that this is an innovative Mission City project, the presence of building operators, public authorities, and energy providers as key stakeholders was expected, given their direct involvement in the management and operation of urban infrastructure and their significance in projects related to sustainability and energy solutions.

Equally noteworthy are the less prominent though still important stakeholders, such as funding foundations, startups, and real estate investors. This suggests that the stakeholder ecosystem is not limited to institutional entities or large organisations but extends to more agile and innovative actors who can play a catalytic role in the development and financing of digital twins.

The inclusion of telecommunication providers and mobility providers highlights the project's interconnectedness with digital infrastructure and smart cities, emphasizing that the successful implementation of digital twins requires collaboration across multiple sectors.

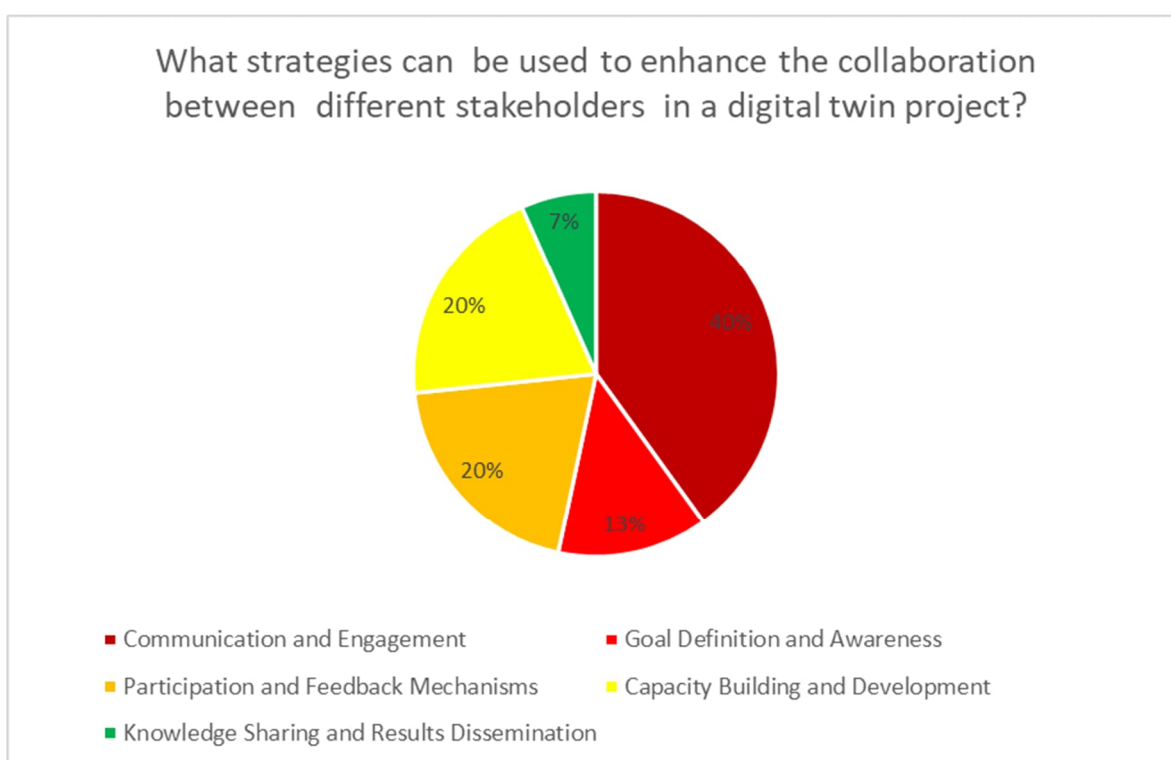


Figure 4: Response to the question “What strategies can be used to enhance the collaboration between different stakeholders in a digital twin project?” from the workshop in Lappeenranta

The results highlight that Communication and Engagement was considered the most critical strategy for enhancing collaboration, accounting for 40% of the responses. This underscores the importance of establishing clear and transparent communication channels to foster trust and alignment among stakeholders. Other significant strategies, such as Participation and Feedback Mechanisms and Capacity Building and Development, indicate the need for inclusive processes that empower stakeholders while ensuring they possess the necessary skills and knowledge to contribute effectively.

Although *Goal Definition and Awareness* and *Knowledge Sharing and Results Dissemination* received lower percentages, their importance should not be underestimated. Clearly defined goals and active dissemination of results are crucial for maintaining alignment and motivation throughout the project lifecycle. In conclusion, a multifaceted approach combining robust communication, participatory practices, and capacity-building initiatives is essential to fostering effective collaboration in digital twin projects.

### 3.3 Demo sites of pilot cities and stakeholder analysis and mapping

The demo site of a city is closely connected to stakeholder mapping and analysis, especially when a project or initiative leverages a pilot area to implement, test, or demonstrate new ideas, policies, or technologies. This approach is exemplified in the TIPS4PED project, where the features of demo sites from each pilot city are highlighted. As part of WP1: “Project Requirements, Specification, KPI Definition, and City Needs,” each city organised a focus group with stakeholders. These focus groups were designed to finalise the stakeholder mapping process by validating preliminary findings and aligning them with the stakeholders' actual needs. The following insights are drawn from the respective reports provided by the cities.

#### 3.3.1 Demo Site Italy, Turin

The identified district in Turin, serving as Light House, spans approximately 260,000 m<sup>2</sup>. It includes the Politecnico di Torino campus, with classrooms, laboratories, and key buildings like the Cittadella Politecnica, the Energy Centre, and the IREN Thermal Plant. It also features university dormitories, municipal buildings, and private properties. Two test areas focus on implementing PED solutions:

- Test Area #1 (Energy Centre), with renewable energy systems, including PV panels, mini-wind generators, and district heating connections
- Test Area #2 (Municipality Office Area), featuring PV panels and EV charging infrastructure, with energy efficiency upgrades planned for municipal buildings.

The district serves as a pilot for TIPS4PED tools, aiming to enhance renewable energy capacity in dense urban areas, engage local stakeholders, and establish Turin's first PED. This initiative aligns with Turin's mission City goals and sets the foundation for replication in Follower Cities, targeting district decarbonisation by 2030.

The focus group created in Turin included a diverse range of stakeholders, with notable representation from local policymakers, citizen associations (including energy-focused groups), and self-consumption communities. Academic and research organisations, such as the Energy Centre at the Polytechnic of Turin, provided critical insights, alongside commercial energy companies, district heating companies, and energy consultants. Additionally, housing developers, public transport companies, and philanthropic organisations added valuable perspectives, highlighting a strong foundation for collaboration across sectors in advancing the PED initiative.

The workshop revealed that the existing stakeholder mapping had addressed the main needs for the energy transition. It was also noted that the participation of stakeholders such as educational institutions and local business communities would be extremely valuable in providing a more representative view of the community dynamics. However, the primary focus remained on engaging energy communities. Key areas of focus included enhancing digital literacy for citizens and leveraging media to promote awareness and engagement.

It is worth noting that stakeholders identified as having high power and interest in the project include local policymakers and energy companies, while citizens and smaller business owners were found to have the highest interest but lower power.

Through the focus group in Turin, the project's objectives were aligned with the diverse needs of stakeholders. The need to maintain open communication channels was highlighted so that stakeholders remain informed about developments, and to continue refining the engagement strategy to ensure the success of the PED initiative. The focus group successfully validated the core needs of the stakeholders, and the feedback received will be instrumental in refining the project's engagement strategy. A consensus was reached on the importance of continuous stakeholder involvement. [1]

### 3.3.2 Demo Site Ireland, Cork

Cork, Ireland's second-largest city, stands out for its cultural heritage and progressive approach to urban sustainability. As a Mission City and a follower city within the TIPS4PED project, Cork is committed to achieving climate neutrality by 2030 while adopting innovative solutions to establish a PED. The identified district features advanced digital tools, including a GIS-based "Mapping Portal", a DT, and an EV-charging infrastructure. However, it currently lacks renewable energy source (RES) installations. To address its retrofit needs, the district seeks to enhance decision-making processes through evidence-based planning and integrated data management, while also upskilling urban planning capacities. This dual focus on innovation and capacity building reflects Cork's dedication to leveraging digitalisation for sustainable development and aligning its urban transformation with global clean energy goals.

Feedback from Cork's Focus Group highlighted the importance of fostering collaboration with a wide array of stakeholders, including community groups, local business representatives, and public authorities. These entities not only provide valuable insights into the social and economic dimensions of the project but fostering broader citizen participation. By ensuring that local perspectives are considered in urban planning and energy solutions, the initiative builds trust and strengthens its social impact. Initiatives such as targeted workshops and iterative updates have proven effective in keeping the community informed and engaged, creating a sense of shared ownership over the project's goals.

To further enhance social engagement, Cork's demo is committed to refining its communication and outreach strategies. This includes implementing video recordings of key presentations to improve accessibility and leveraging the expertise of academic and business groups to communicate the project's long-term benefits effectively. Regular updates and transparent discussions on next steps are vital to maintaining momentum and fostering deeper collaboration. By emphasising inclusivity and aligning engagement strategies with the interests of specific groups, Cork sets an example for sustainable urban development centred on people-first planning.[2]

### 3.3.3 Demo Site Hungary, Budapest

Budapest, capital of Hungary, is a city that combines its rich historical heritage with progressive urban development. As a follower city within the TIPS4PED project and a designated Mission City within the framework of sustainable urban initiatives, Budapest is actively working towards climate neutrality by 2030. The 10<sup>th</sup> District, Kőbánya, serves as a prime example of this commitment, blending its role as the city's main industrial hub with significant residential and commercial functions. Kőbánya has already demonstrated progress in renewable energy integration, with a geothermal pilot project and solar thermal panels operating on public buildings. Additionally, the district benefits from advanced digitalisation tools, such as a Building

Information Modelling (BIM) system for municipal buildings, alongside a district heating (DH) network and EV charging infrastructure. These existing assets position Budapest to effectively leverage innovative solutions and collaborative efforts in achieving its ambitious sustainability goals.

The TIPS4PED project in Budapest places a strong emphasis on stakeholder engagement to ensure that energy-related decisions are both data-driven and aligned with the district's specific needs. During the focus group conducted with the Kőbánya municipality, stakeholders highlighted the importance of enhancing existing software to provide more comprehensive and actionable data.

Collaboration among diverse stakeholders was underscored as crucial for success. The need for an integrated framework to connect public, private, and community factors emerged as a recurring theme. Improved cooperation can facilitate better data sharing, coordinated planning, and effective execution of energy projects. Additionally, stakeholders emphasised the value of detailed analyses that extend beyond immediate energy savings to include long-term maintenance costs and the required expertise for system upkeep. Finally, the municipality of Kőbánya is eager to engage external stakeholders and draw from the experiences of the Light House city, Torino, adapting successful strategies to its local context. [3]

### 3.3.4 Demo Site Greece, Kozani

Kozani, located in the Region of Western Macedonia, Greece, is a city that blends its residential and institutional character with a forward-looking vision for sustainable urban development. As a follower city and a designated Mission City under European sustainability initiatives, Kozani is committed to advancing climate-neutral solutions. The Active Urban Planning Zone of Kozani (ZEP) area, a focal point in the city, combines social housing with significant service buildings, such as the premises of the Regional Authority of Western Macedonia, the newly developed campus of the University of Western Macedonia, and model bioclimatic school complex which features an advanced energy management system. In collaboration with CluBE, the Municipality of Kozani is working towards the development of a Digital Twin for the ZEP area. This innovative tool aims to enhance decision-making processes and support integrated planning activities that will transform the district into a PED, reflecting Kozani's dedication to fostering a sustainable and inclusive urban future.

Kozani's focus groups engaged a diverse array of stakeholders, including local policymakers, residents, research organisations, and local companies. Among the key stakeholders, local policymakers were unanimously considered essential for the success of the project. Energy companies, aggregators, and research organisations were also deemed important by nearly half of the participants, while district heating companies, local residents, and citizen associations were recognised as significant by about one-fourth of the attendees. These insights underscore the necessity of fostering broad and inclusive stakeholder collaboration.

The event was pivotal in enabling stakeholders to articulate and gain a clearer understanding of their specific needs in relation to the project. Through active discussions, participants shared perspectives on the features and improvements they expect from the IAP, creating a foundation for more targeted development. Moreover, the attendance data revealed a high level of genuine commitment among stakeholders to engage in the transformation process. This shared dedication reinforces the potential for successful collaboration and paves the way for an inclusive and community-driven approach to achieving Kozani's sustainability goals. [4]

## 4 CO-CREATION METHODOLOGY

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### 4.1 Defining co-creation

In the domain of participatory design, the words co-design and co-creations are sometimes used interchangeably. However, Sanders and Steppers (2008) pointed out a critical difference between the two processes. Co-creation can be defined as an act of collective creativity. i.e. creativity shared by two or more people and can be applied to many situations and problem contexts. Co-design on the other hand is a specific instantiation of co-creation, focused on creativity applied throughout the design cycle and can have a diverse set of participants.

Participatory design has gained influence in the changing landscape of human-centered design research, which began in the 1970s and has been widely used to develop consumer products. However, this process proved insufficient to meet the growing need to design the future experiences that people, communities, and cultures, may experience [5],[6]. As the challenge is about designing future experiences, it becomes important to focus on who should participate. This requires a change in traditional attitude toward design, where the expert-led design process gives way to a more co-design approach which is based on the philosophy that all people are creative, even though at different levels, can contribute to the design process and co-creation activities.

### 4.2 Co-creation in TIPS4PED

The TIPS4PED project involves diverse stakeholders and citizens in the co-creation activity and the participants are invited 1) to frame the problem related to PEDs, 2) to design targeted, small-scale interventions addressing urban challenges, and 3) to participate in IAP co-creation using the Appathon approach. A full-day activity plan will engage the participants in a structured manner toward the co-creation of IAP services that will form the input for other work packages. These workshops will be carried out at multiple locations and can be made adaptable to suit the local context of different cities and PEDs. For example, the workshop could be conducted in the local language and the findings would then be reported in English. A full-day tentative workshop plan is shown below in Table 1.

Table 1: Full- day tentative plan

**Objective:**

This workshop aims to introduce Positive Energy District (PEDs) to the participants through a ‘play a board game’ approach, where players race to reach the PED first, and co-create PED services for a digital twin of the PED. This workshop will conduct co-design activities with energy citizens and other stakeholders in the energy sector, to better shape and develop the proposed tools and services that will be implemented in the Digital Twin.

**Target Audience:**

- Energy Companies Executives
- City officials
- Policymakers
- Citizens
- Municipal officials
- Students
- Businesses
- Researchers

The workshop is planned for one day. The results of the workshop will be incorporated into IAP development.

**Agenda and Timings (DAY - DD/MM – HH: MM a.m. to HH: MM p.m.)**

**Introduction (15 min)**

**Activities:** Introduction to the TIPS4PED project and the workshop scope.

**Speakers:** Project Researchers

**Icebreaker PED board game (Race to PED) (45 min – 1hr 15min)**

**Activities:** PED Board Game that imparts relevant competency related to PEDs.

**Resources:** PED Board, PED play cards, PED Player Tokens, Game Dice

**Facilitator:** Project Researchers

**Break (30 – 40 min)**

**Activities:** Refreshments for participation.

**PED Appathon (Co-creation of PED services) (2 hrs 45 min)**

**Activities:** PED appathon that co-creates services for IAP development.

**Resources:**

- A suitable place to accommodate 30+ people,
- Workstations or tables for 6 people to sit around for each game. So at least 5 tables
- Projector
- Microphones and speakers
- Refreshments
- Worksheet,
- App tokens,
- Pens,
- Other stationery

**Facilitator:** Project Researchers

**Total Time for Workshop – 5 Hrs. (including 30 min break)**

**Language of the workshop – English / Local**

**Max. number of participants – 30**

## 4.3 Educational and problem-framing events

Co-creation activities require the participants to be made familiar with the co-creation context and require facilitators who introduce the problem domain to the participants. The role of the facilitator is to recruit, engage, and conduct co-creation activities. This requires that the co-creation activity be designed in such a manner that it is inclusive, accessible, and suitable for people with different literacy levels. Moreover, the co-creation activity must have a clear objective and a clear direction for participants, and participants should be made available with suitable tools to aid them in the co-creation activity.

One way to engage participants is through gamification methods. A gamification method incorporates aspects of a game into the co-creation activity. Gamification techniques have been proven to be useful in many contexts such as education and training as well as for co-creation activities. Gamification allows researchers to introduce a new set of challenges for the participants in an incremental manner and can help in introducing concepts and challenges to the participants and involve them in synthesizing solution approaches through gameplay. There are many ways this activity could be designed but keeping in mind the portability and diversity of context, the TIPS4PED will use a boardgame based design to come up with high-level problem framing. The Table 2: Game Levels shows the different zones or levels in the game and the corresponding co-creation objectives. Table 3: Game mechanics and Co-creation Aspect shows how game mechanics and corresponding co-creational aspects. These activities are designed to familiarize participants with PEDS and prepare them for the final appathon activity.

Table 2: Game Levels

Game Levels	Co-creation goals
Zone of Unawareness	Introduction to PED Context and Stakeholder Personas
Zone of Awareness	Exploring questions and ideas from multiple stakeholder points of view
Zone of Activity	Co-creating common goals and identifying needs
Zone of Advocacy	Co-creating potential solutions incorporating stakeholders' and end user's needs.

Table 3: Game mechanics and Co-creation Aspect

Game Mechanics	Co-creation Aspects
Personas	Allows participants to take part in the activity and to understand how people may think or react differently as they progress in the game by supporting those who need it to get more familiar with the PED concept and facts during the game and to think about how the transition affects different stakeholders in the society.
Levels	Allows participants to get familiar with the PED concept and basics initially through questions and discussions, and then gradually progress toward understanding and critically examining issues, and finally solution identification through stakeholder-led exploitation of outcomes.
Moves in a Level	Allows participants to focus on one particular aspect or topic through different stakeholder contexts.
Co-design Canvas	Guides participants towards critically examining issues and co-create a solution approach.

## 4.4 Appathons

Appathons are events where people come together to collaborate and develop new applications, products, or services in a short amount of time. They often involve brainstorming, coding, and prototyping. It is a more practical approach to co-creation than a post-it-based or screen-based approach. Appathon can help scope the requirements more accurately and can help define service needs more elaborately including the visual aspects. In an appathon approach, multiple teams participate competitively to co-create the best suitable solution. The aspect of competition motivates teams and provides multiple solutions. Appathons are more inclusive than hackathons as the main difference between hackathons and appathons is that there are no technical barriers in appathons, so anyone can participate, and people find it easy to say how they want things to look more than how they want things to work. High-level use cases can be derived from sketched screens based on appathon results. Table 4: Appathon Plan shows a high-level appathon plan, while Figure 5 illustrates an example of an Appathon day workflow, providing a detailed overview of the activities and processes involved throughout the event.

Table 4: Appathon Plan

Appathon Plan	Why
Input use cases from gamified Co-creation workshop	Describe high-level scenarios
Create Appathon toolkit	The prototype uses no code design elements like icons, navigational, and screen elements.
Collect Codesign output	Report on output to WPs



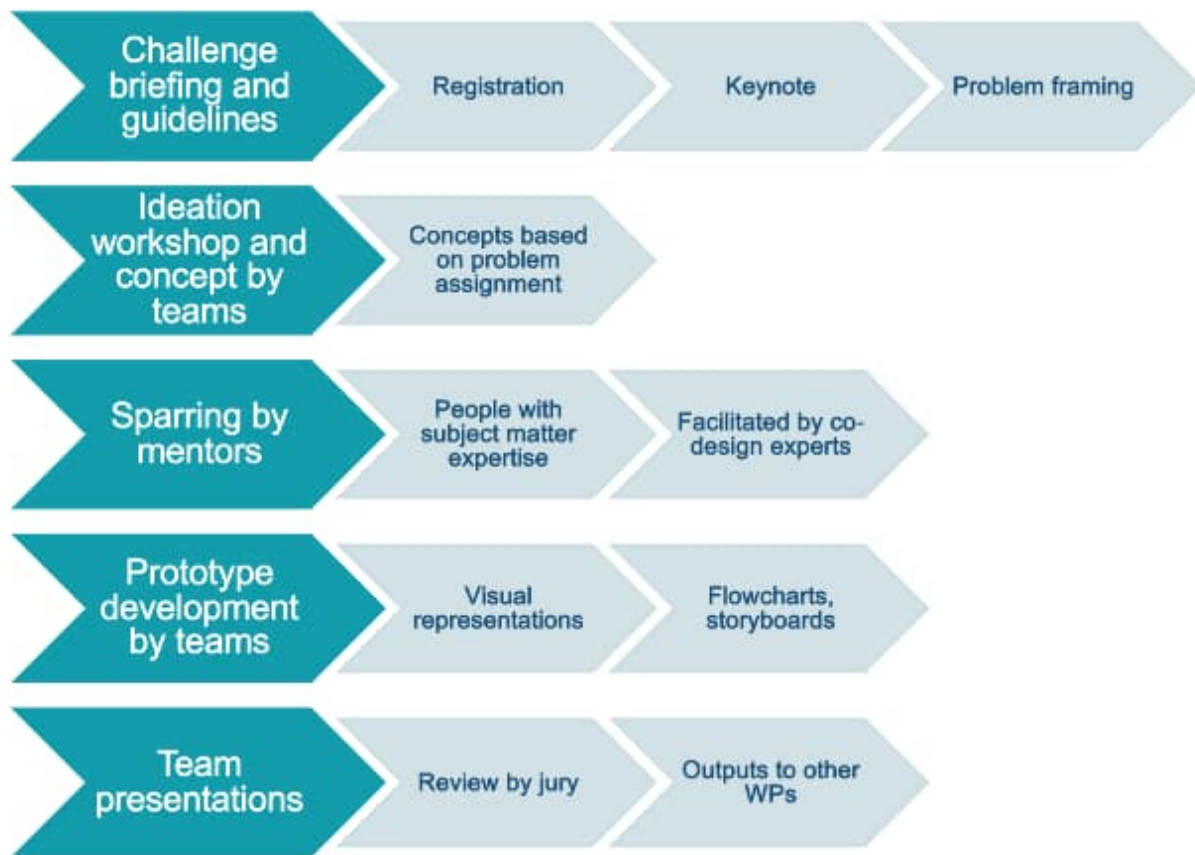


Figure 5: Appathon: Example Day workflow

## 5 STAKEHOLDER/CITIZEN ENGAGEMENT

### 5.1 Stakeholder/Citizens Engagement Strategy

In today's dynamic operational landscape, organisations face numerous challenges, such as meeting stringent deadlines, engaging with diverse stakeholders, and developing innovative solutions to meet evolving demands. These challenges are particularly evident in sectors undergoing significant transformation, such as energy and urban innovation. The question arises: can these complexities be addressed through strategic collaboration with stakeholders and citizens? By aligning efforts and fostering collective participation, organisations can unlock new opportunities for growth and resilience. Stakeholder engagement is a critical factor in driving successful outcomes, especially in complex sectors like the energy transition. It serves multiple purposes, including:

- Communication to convey objectives and updates
- Fostering acceptance and buy-in from stakeholders, ensuring alignment with organisational goals
- Encouraging behavioural change necessary for sustainability and long-term impact
- Maintaining justice and democratic standards to ensure equitable and inclusive decision-making

Engagement strategies often blend participatory approaches and interventions aimed at promoting pro-environmental behaviour. This intersection is vital for fostering collaboration, knowledge exchange, and integrated solutions that reflect diverse perspectives. Involving a wide range of stakeholders –including individuals, organisations, communities, and interest groups– is essential for addressing environmental issues. Effective engagement fosters:

- Collaboration across sectors to develop holistic solutions
- Knowledge sharing that leverages diverse expertise and insights
- Relationship-building that strengthens trust and facilitates ongoing dialogue. Through continuous engagement, organisations can ensure that those impacted by their decisions have a voice in the decision-making process, ultimately leading to more sustainable and inclusive outcomes

Strategic stakeholder engagement is a continuous and essential activity for organisations navigating complex challenges. By fostering collaboration, maintaining transparency, and utilising diverse communication channels, organisations can build resilient relationships, facilitate knowledge sharing, and develop integrated solutions that benefit all stakeholders. Ultimately, aligning efforts through effective engagement creates a pathway for innovation, sustainability, and organisational success.[7]

#### 5.1.1 Stakeholder engagement steps

A strategic engagement plan can act as a guide through a series of steps, prior to any brainstorming session regarding the strategy itself. It also outlines clearly what actions to take and when, assisting this way to maximise the chances of the strategy being embraced by the organisation.

There are five key components to a strategic engagement plan:

- **Pre-Planning:** This initial step in the engagement strategy should involve stakeholders in the process. It must clarify how the demos will include the stakeholders in the strategic planning. The sooner a stakeholder is engaged, the better the possibility of them being committed to the project and its

objectives. Allowing ideas from the stakeholders to be put into consideration builds confidence and ensures that the process remains genuinely collaborative rather than merely performative. Though a general vision might provide a backbone for the strategy, ideas and input by the stakeholders should be openly heard, discussed, and meaningfully integrated into the plans.

- **Cascading Strategy:** The process of implementing a strategic plan calls for a proper flow or dissemination approach. A cascading strategy decomposes the high-level elements of a strategic plan into an actionable objectives-assigning approach to key individuals, who then translate those into specific goals that are cascaded to their respective teams.
- **Strategy Communications Plan:** The development of the communications strategy is an internal part of the strategic engagement process. This step ensures the flow of the strategy into the organisation, creating momentum and garnering widespread support for its adoption.
- **Integrating Strategy:** One of the most challenging aspects of any new strategy is the implementation phase. This involves ensuring that the pilot leaders can effectively balance the demands of the stakeholders without losing their scope.

### 5.1.2 Stakeholder engagement: Insights from the TIPS4PED Project Workshop

As referenced in Chapter 3, a workshop was conducted among TIPS4PED partners, during which participants were divided into four groups to address specific questions related to the project. Among these, Question 2 and Question 4 focused on stakeholder engagement. The sections below present these questions alongside the most prominent and recurring responses provided by the groups, reflecting shared insights and priorities in the realm of stakeholder engagement.

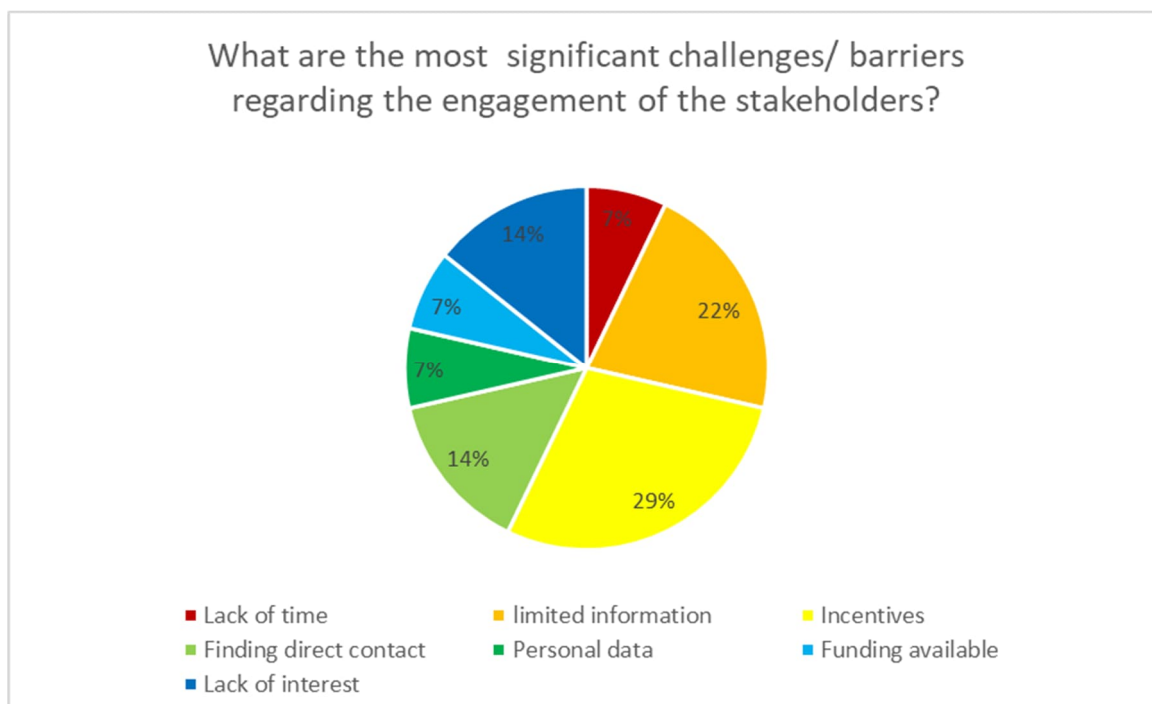


Figure 6: Response to the question “What are the most significant challenges/barriers regarding the engagement of the stakeholders?” from the workshop in Lappeenranta

The responses presented in Figure 6: Response to the question “What are the most significant challenges/barriers regarding the engagement of the stakeholders?” from the workshop in Lappeenranta, underline the most significant obstacles the pilot leaders may face in the process of stakeholder engagement. From the workshop held in Lappeenranta the consortium members mentioned 7 possible barriers, with two of them being the most common. Limited information and Incentives, two key factors for attracting stakeholders, since it is very important for them to have clear understanding of the project and the benefits it will have for them.

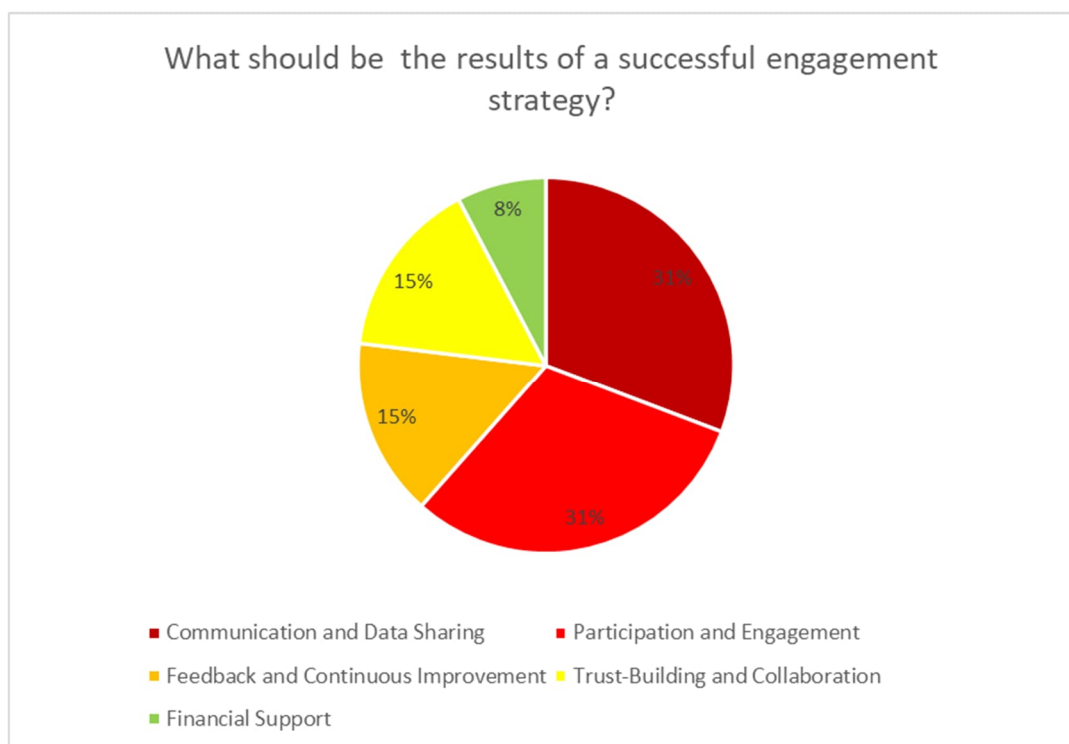


Figure 7: Response to the question “What should be the results of a successful engagement strategy?” from the workshop in Lappeenranta

Collectively, the insights from Figure 7: Response to the question “What should be the results of a successful engagement strategy?” from the workshop in Lappeenranta suggest that a successful engagement strategy should prioritise clear and open communication, create participatory opportunities, and establish systems for ongoing feedback and collaboration. By doing so, it can build trust, adapt to stakeholders' evolving needs, and ensure the long-term sustainability and effectiveness of the TIPS4PED initiative.

## 5.2 Communication Channels

An effective communication plan is important in supporting and enhancing stakeholder engagement throughout the project life cycle. Although the focus of this report is mainly on the social engagement strategy, it is essential to draw a link between communication and engagement. Communication channels like Twitter, LinkedIn, Email, YouTube and e-newsletter that have already been developed by TIS4PED project are important means of maintaining ongoing interaction with the stakeholders. These platforms allow the transfer

of project updates and lessons learned, but also build up transparency, trust, and alignment to project goals. By embedding communication activities within the engagement strategy, the project ensures that stakeholders are informed, empowered, and motivated to make valuable contributions. This will be important in sustaining collaborations, identifying new opportunities, and building a well-informed community that actively supports and improves project outcomes. Thus, the conclusion of this communications-focused section underlines its integral role in achieving the broader goals of stakeholder engagement.

## 5.3 Tools and methods for community engagement

The catalogue distinguishes between tools and methods. According to the EU Green SAM project (GreenSam 2021), tools are commonly used and recognized engagement devices that have an inherent purpose and can be used independently (e.g., public workshops, public hearings, and community days). Methods describe the principle or general approach that a tool can take (i.e., the use of a particular method during the implementation of an event or workshop, such as fishbowls and VIPP card collection clustering). In some cases, such a distinction is not possible (e.g., consensus workshops), and they are presented as both tools and methods. Additionally, Living Labs have been included in the catalogue as an open innovation approach to urban renewal. They cannot be classified as either a tool or method, and they can use the other tools and methods in the catalogue to engage their citizen panel.

Before planning a community engagement program, it is important for them to be clear about its purpose. This clarity will help identify the program's goals, outcomes, and level of engagement. The engagement technique will vary for each situation and will be determined by several important aspects, such as the goals of the event, the community involved in the engagement program, their specific concerns, resources, and the project's budget.

There is a wide range of tools and techniques that can be used to undertake effective and positive community engagement. Some examples are shown below:

- Stakeholder workshops
- Focus groups
- Newsletter
- Roundtable network event
- Opinion Surveys
- Mapping event
- Process mapping
- Community conference and survey
- Open house events
- Social media: Twitter, Facebook, blogs
- Paper-based questionnaire
- Online questionnaire
- Special interest groups

Exploring more than one engagement method can certainly help drive more active engagement with community stakeholders and increase dialogue and interaction. Several different methods can be used to engage communities, such as:

- Public meetings: Public meetings and drop-in sessions are a great way to engage with the community and learn about the community's needs. These meetings can be open to anyone who

wants to attend, or they can be invite-only. City councils usually hold this type of meeting to talk about transportation, budget, and public safety.

- Events: Holding events such as open houses or town halls is a good option to bring the community together, inform stakeholders about the organization and its projects and provide them with an opportunity to give their input.
- Surveys: Surveys are another communication channel that can be useful for gathering information from the community. Using open-ended questions helps obtain more detailed opinions and comments from stakeholders. Many organizations with national coverage conduct annual surveys to gauge the needs of communities across the country.
- Focus groups and workshops: Focus groups are a more intimate way to engage with a group of people and get their views on a particular issue, theme, or project. Tech companies often use this method to get feedback on new products and features.
- Citizens' panels: Panels involving a couple of thousand stakeholders that represent their local communities are surveyed throughout the year by phone, post, or even online. As the panels are held with the same people, it's possible to identify changes over time.
- Website and blog: Another method is to create a website or blog where stakeholders can go to learn more about the business and its work in the community. It's important to always keep it up to date with the latest news and information, otherwise, it won't achieve its purpose of informing stakeholders.
- Social media: Organizations can also use social media to engage with their stakeholders. By creating a Facebook page or Twitter account, they can provide updates on their work in the community while giving stakeholders a platform to voice their concerns.

## 5.4 Monitoring and Evaluation

Evaluations are essential for measuring the effectiveness of a project and demonstrating achievements. Your engagement strategy and registration plan need to be updated to reflect the findings of your monitoring and evaluation. You should update it to reflect lessons learned from work you have already undertaken and to include any new information about your registration area. This information will help to continue to refine the picture you have of the demographics of your area, confirm what the key challenges for engaging with your residents are, and measure which activities are most effective in engaging with different target audiences.

You should outline how you will monitor and evaluate how effective your public engagement activity and tactics to engage your target groups were during the last canvass, at scheduled polls, and in your ongoing activity to maximize registration. Did you reach your target audience? Measuring the success of your engagement activities to evaluate the success of an activity, it is important to have clear, measurable objectives, and any evaluation measures should relate clearly to the initial objectives. A variety of methods will likely be needed to evaluate a project. To identify the most appropriate methods to use for evaluation you should define the questions to be asked to form the evaluation and consider how these questions might be answered.

There are a variety of methods that can be used to assess the effectiveness of your activity, some of which might be behaviour-based (what people have done, what has actually happened) and some of which might be perception-based (what people believe to have happened).

The following are some mechanisms for collecting evidence to support your evaluation:

- Recording feedback from the public at events or via your website
- Recording the level of responses as a result of the activity
- Recording the number of inquiries on the subject
- Recording the number of hits to the website requesting information

- Recording any feedback provided on social media
- Distributing evaluation questionnaires or feedback forms at the end of an event
- Conducting a public opinion survey to determine whether the public were aware of your activity, their thoughts about it and whether they took action as a result
- Conducting pre-activity and post-activity surveys to determine whether people's knowledge and awareness of registration and the process has increased as a result of the activity
- Interviews with stakeholders to determine what they thought of the activity
- Focus groups were held with residents to gather feedback – potentially as part of other events.

Monitoring of progress and evaluation should be carried out at the end of each key stage of registration activity to ensure activities are effective and remain appropriate. While it is important to undertake evaluation as extensively as possible, consideration should be given to the resources allocated and the cost of evaluation should be proportionate to the cost of the project. You may not be able to evaluate everything in the detail you would like, and you should set out any limitations to the evaluation in your plans, including any potential risks to the reliability and validity of the evaluation and findings. Your evaluation plans should identify relevant stakeholders, such as other local authorities, who may be interested in the evaluation and with whom the findings should be shared.

## 5.5 Adaptability in communication styles

Communication adaptability is an outcome of communication competence, which, for this study, is most appropriately defined as the ability to engage in appropriate communication behaviours in a given situation. Since communicative adaptability is specifically concerned with the social contexts of communicative competence, it is a measure of social communicative competence. Communication adaptability is derived from aspects of speech accommodation theory, specifically, Communication Accommodation Theory, and the theory of communication adaptability. Communication adaptability is defined as: "the ability to perceive socio-interpersonal relationships and to adapt one's interactional goals and behaviours accordingly". In other words, communication adaptability occurs when individuals use communicative competence to adapt to different contexts. Communication adaptability focuses on six key dimensions: social experience, social composure, social validation, appropriate disclosure, articulation, and humour.

## 5.6 Risk Management

Stakeholder engagement is a critical component of project management, influencing the success or failure of initiatives across industries. However, a poorly designed or executed stakeholder engagement strategy can introduce various risks that undermine project goals. This chapter explores these risks, their potential impacts, and strategies to mitigate them effectively. The common risks in stakeholder engagement are:

- Lack of Support or Commitment: Poor engagement can cause key stakeholders, especially sponsors, to withhold resources or lower the project's priority. This often leads to delays, resource shortages, and reduced project visibility within the organization.
- Resistance to Change: Stakeholders may resist new processes, systems, or policies introduced by the project. This resistance can manifest as passive disengagement or active opposition.
- Communication Challenges: Miscommunication or information overload can lead to misaligned expectations and confusion about project objectives.
- Scope Creep: Stakeholders might request additional features or changes beyond the initial project scope, leading to scope creep and resource strain.

- **Competing Priorities:** Stakeholders may have conflicting priorities or limited availability, resulting in resource allocation challenges and potential delays.
- **Legal and Compliance Risks:** Non-compliance with legal or regulatory requirements, often due to stakeholder oversight, can expose the project to legal action or penalties.
- **Financial Risks:** Unclear or unrealistic budget expectations from stakeholders can lead to overspending or funding instability if support is withdrawn.
- **Ethical Concerns:** Conflicts of interest and a lack of transparency among stakeholders can erode trust and jeopardize project stability.

Managing stakeholder engagement risks requires a proactive, structured approach that addresses potential challenges before they escalate. Misunderstandings, delays, and even project failure can result from ineffective engagement. To mitigate risk and align stakeholder expectations with project goals, organizations must implement targeted strategies. Some strategies are:

- **Adopt a Structured Framework:** Implementing frameworks that help organizations systematically address risks by promoting transparent, inclusive, and responsive stakeholder engagement
- **Continuous Monitoring and Feedback:** Regularly review engagement outcomes and adjust strategies to ensure alignment with stakeholder expectations and evolving project requirements.
- **Stakeholder Education:** Equip stakeholders with the knowledge and skills necessary to understand the project's value, their roles, and potential impacts.

Efficient stakeholder engagement is critical to project success, but there are inherent risks that require proactive management. Through early identification of potential risks, strategic stakeholder engagement, and adherence to best practices, organizations can mitigate these risks and ensure positive project outcomes.



## 6 ACTIVITY MONITORING

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Activity monitoring involves tracking, analyzing, and evaluating the activities carried out to achieve a desired outcome. In the context of a stakeholder engagement strategy, this process ensures that the project remains on track and adapts effectively to any challenges encountered. By continuously monitoring activities, project stakeholders can identify areas where the strategy may fall short and make necessary adjustments, ensuring a proactive approach to engagement.

One key outcome of activity monitoring is the improvement of project efficiency. By assessing metrics such as the frequency and quality of interactions, the inclusivity of participation, and the effectiveness of communication efforts, teams can refine their strategies to better align with stakeholder needs. This not only enhances buy-in from stakeholders but also minimizes potential conflicts or misunderstandings. Detecting gaps in engagement early allows teams to address them swiftly, fostering a collaborative environment where all voices are represented.

Regular communication, supported by activity monitoring, is essential for maintaining transparency and trust. By aligning stakeholder concerns and interests with project objectives, teams demonstrate a commitment to meaningful engagement. Clear goals and a structured monitoring framework ensure that interactions remain purposeful and lead to tangible outcomes, benefiting all parties involved. Ultimately, the mutual responsibility of stakeholders and project teams to keep open lines of communication underscores the importance of a robust monitoring process in achieving project success.

### 6.1 Establishing Key Performance Indicators

Key performance indicators (KPIs) are tools used to evaluate a business's progress toward specific, measurable objectives. They can be compared to predefined benchmarks, industry competitors, or the company's past performance. Also known as key success indicators (KSIs), the choice of KPIs varies across industries and organizations based on their goals. For instance, a software company focused on rapid growth might prioritize year-over-year (YOY) revenue as a key metric, while a retail chain may emphasize same-store sales to gauge performance.

Effective KPIs rely on accurate data collection, processing, and analysis. This data is compared against established targets, helping businesses assess the effectiveness of their current strategies and systems. Based on these insights, management can decide whether to maintain or adjust processes to improve outcomes and meet future goals.

Ultimately, KPIs provide concise, data-driven insights that enable management to make informed strategic decisions. These metrics are typically tracked using analytics and reporting tools to ensure continuous performance monitoring and improvement.

Creating an effective KPI report can be challenging due to the vast amount of data that is available, but following a structured approach will help to ensure that the metrics that are most relevant to decision-making are highlighted. The process begins with clearly defining the goals and objectives that the KPIs will support. Once the goals are established, the selection of KPIs must be aligned with the achievement of those goals, ensuring that they provide actionable insights.

Flexibility is essential during this process, as new challenges and evolving business needs may require adjustments to the selected KPIs, their targets, and the metrics being tracked. It's important to avoid overwhelming users by including too many indicators in a single report, as this can lead to confusion and loss of focus. Instead, creating separate reports for different goals or issues can increase clarity and impact.

KPIs offer several benefits to organizations. They encourage the setting of specific, actionable goals and promote a purpose-driven approach to operations. By providing data-driven insights, they help management identify problems and develop quantifiable solutions, improving strategic planning and operational efficiency. KPIs also promote accountability by providing objective, measurable performance assessments that help employees stay focused and motivated. In addition, they bridge the gap between an organization's strategic goals and day-to-day operations by tracking progress toward those goals.

Despite their advantages, KPIs come with certain limitations. Collecting and analysing meaningful data, especially for tracking long-term trends, requires a substantial time investment. To remain effective, KPIs must be reviewed and evaluated consistently; otherwise, their value diminishes. Additionally, KPIs can be misused if managers focus on improving metrics for personal gain, such as achieving performance-related bonuses, rather than making genuine improvements. This misuse can lead to lower quality outcomes and employee dissatisfaction, particularly when KPI targets are unrealistic or poorly aligned with actual business goals.

To maximize their effectiveness, it's essential to balance the strengths and weaknesses of KPIs, ensuring they continue to serve as a reliable tool for enhancing performance, fostering accountability, and guiding strategic decisions.

### 6.1.1 The KPIs set for the TIPS4PED project

It is essential to establish Key Performance Indicators (KPIs) which align with the project's objectives and measurable outcomes. Start by identifying specific goals, such as increasing stakeholder participation, improving communication, or driving behaviour change within the target communities. One KPI could measure the number of stakeholders engaged, such as community members, policymakers, or NGOs. Considering the special characteristics of each pilot site and the different stakeholders evolved the engagement related KPIs should be monitored regularly by the pilot leaders. Growth in the project's digital presence, such as increased social media followers or newsletter subscribers already serve as relevant KPIs.

Here are some examples of possible KPIs to set for measuring the effectiveness of the Social Engagement on the different pilot sites:

- **Engagement of Stakeholders:** A key performance indicator (KPI) involves the number of stakeholders involved in the initiative. This metric is important as it directly impacts our capacity to provide results that are to the regional standards. Tracking the number of stakeholders engaged helps us understand if we are making progress towards our strategic objective. Additionally, this KPI allows us to assess how engaged our stakeholders are and spot opportunities for increased collaboration. Furthermore, this KPI allows us to measure the degree of stakeholder participation and pinpoint specific areas for deeper engagement. It is important to know the degree of engagement to determine the inputs made by stakeholders, harmonize their interests with the scope of the project, and facilitate their active involvement in the achievement of project targets. In the end, it is the building of substantial relationships with stakeholders that sustains the outputs and effectiveness of our Social Engagement Strategy.

- Number of Events Organized: Another Key Performance Indicator (KPI) that measures the success of our Social Engagement Strategy is the number of events that we organize and develop to facilitate our stakeholder's engagement in the region. Events are a key opportunity to network, exchange knowledge, and foster collaboration between stakeholders. Monitoring this metric allows for the determination of the success of the outreach campaigns and the degree of responsiveness and involvement of the community. Moreover, it enables evaluation of the extent to which these events are relevant to the goals of the institution and the bigger regional vision. The number and the quality of such events, which are routinely recorded, help in maintaining the relevance and effectiveness of engagement activities concerning the mission.
- Also, from the stakeholder's perspective it would be important to provide them with the opportunity to measure their satisfaction level both with the project and the engagement methods. This information will give the pilot leaders helpful insights for improvement on future events.
- In time and with careful consideration, more KPIs might be seen as crucial to monitor...

By defining these KPIs, the TIPS4PED project can effectively monitor the progress of its Social Engagement Strategy, ensuring it remains aligned with its objectives and making necessary adjustments along the way to enhance its impact.

## 6.2 Development of a monitoring plan

There is a need to establish a monitoring plan for the stakeholder engagement strategy to systematically facilitate tracking and modification of the strategy in case it is not performing effectively as intended. This process begins with developing important goals for engaging stakeholders and establishing the key performance indicators (KPIs) used to determine success. Some of these KPIs may relate to stakeholder engagement such as frequency of attendance, levels of satisfaction, or even the amount of input given by the stakeholders.

Having set the goals, the next step would involve spelling out the procedures for data collection, data analysis, and data reporting. Monitoring in this sense involves spin-off regular measurements of the activities intended to engage the stakeholders and whether they are at the desired intensity and also whether the communication efforts are well positioned to achieve the objectives. Feedback loops are key to this boundary process as they allow the organization to 'hear what they say' and to find out what is missing or what could be better during the implementation phase. Changes may deal with the improvement of communication channels, the change of the strategies for engaging stakeholders or changing the areas where the resources have been focused.

Lastly, it is key to note that termination is part and parcel of the monitoring plan. Routine reviews and changes as necessary make it possible for the stakeholder engagement strategy to remain relevant to the objectives of the organization and any changing demands from the stakeholders. Such a process encourages accountability and trust and improves the practice of engaging the stakeholders.

## 7 CONCLUSIONS

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The TIPS4PED project's Social Engagement Strategy represents a cornerstone for achieving the ambitious objectives of the initiative, notably the implementation of Positive Energy Districts (PEDs) across diverse European pilot cities. By leveraging a participatory and inclusive approach, this strategy has underscored the importance of collaboration, transparency, and adaptability in urban transformation processes. The stakeholder mapping and analysis undertaken within the project highlighted the intricate and diverse networks of actors involved in PED development. From policymakers and local governments to businesses, NGOs, and citizens, the project has systematically identified and categorized stakeholder groups based on their levels of influence and interest. This foundational step has allowed the project to tailor its engagement activities effectively, ensuring that the unique needs, aspirations, and challenges of each stakeholder group are addressed. The engagement insights gathered from the focus groups in Turin, Cork, Budapest, and Kozani further emphasized the necessity of localized strategies that respect cultural, social, and economic contexts.

Central to the success of the engagement strategy has been the innovative use of co-creation methodologies. The introduction of gamification techniques, such as the PED board game, and participatory workshops, like the Appathon, have provided interactive and accessible avenues for stakeholders to engage with complex technical concepts. These tools have not only demystified the digital twin technologies but have also empowered participants to actively contribute to the design and refinement of the Integrated Assessment Platform (IAP). By fostering a sense of ownership, these methods have strengthened trust and collaboration among stakeholders, laying the groundwork for sustainable and impactful PED implementations.

The strategy's emphasis on effective communication has also played a pivotal role. Utilizing a blend of traditional and digital channels, such as social media, newsletters, and workshops, the project has ensured consistent and transparent dissemination of information. This multi-channel approach has allowed TIPS4PED to reach a broad and diverse audience, fostering awareness of the project's goals and encouraging active participation. Additionally, the adaptability of communication styles has been critical in addressing the varied preferences and capacities of stakeholders, ensuring inclusivity and accessibility.

The monitoring and evaluation framework, underpinned by carefully selected KPIs, has provided a robust mechanism for assessing the effectiveness of engagement activities. Metrics such as stakeholder participation rates, the number of events organized, and the quality of feedback received will offer valuable insights into the strategy's progress and areas for improvement. Regular reviews and adaptive measures will ensure that the strategy remains dynamic, responsive, and aligned with the evolving needs of stakeholders and project objectives.

Importantly, the TIPS4PED Social Engagement Strategy has not only supported the technical and operational goals of the project but has also contributed to a broader vision of fostering climate-neutral, people-centric urban environments. By emphasizing the active involvement of local communities and the integration of their perspectives into decision-making processes, the project has highlighted the transformative potential of social engagement in achieving sustainability. As the project moves forward, the lessons learned and best practices established through this strategy will serve as a valuable resource for scaling and replicating PEDs across Europe and beyond. The emphasis on stakeholder collaboration, innovative engagement tools, and rigorous monitoring will ensure that TIPS4PED continues to deliver impactful and replicable outcomes. In doing so, the project is not only contributing to the realization of the European Union's climate goals but also setting a precedent for how technological innovation and community empowerment can drive sustainable urban development in the decades to come.

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