TRANSIENCE

TRANSITIONING TOWARDS AN EFFICIENT, CARBON-NEUTRAL CIRCULAR EUROPEAN INDUSTRY

Date: 23/04/2024

D2.1 – Multi-layered stakeholder engagement strategy

WP2 – Understanding stakeholder needs for new capacities

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EC Summary Requirements

1. Changes with respect to the DoA

No changes with respect to the work described in the DoA.

2. Dissemination and uptake

Deliverable D2.1 will be primarily used as a reference document by TRANSIENCE project partners to conceptualise, plan, and execute stakeholder engagement activities throughout the project. In addition, engaged and/or interested stakeholders could benefit from consulting this document to understand the scope, methods, and objectives of stakeholder engagement within TRANSIENCE.

3. Short summary of results (<250 words)

The TRANSIENCE project sets out to explore the implications of the EU transition towards a circular and climate-neutral economy through a co-creative modelling exercise. This deliverable outlines the TRANSIENCE stakeholder engagement strategy, which will guide engagement activities throughout the project. Stakeholder engagement will ensure the policy relevance of modelling outcomes, whilst promoting knowledge sharing and guaranteeing transparency and openness in the modelling process. The systematic mapping and grouping of project-relevant stakeholders will allow for tailoring TRANSIENCE engagement activities to stakeholders' needs and requirements. The prioritisation of stakeholders based on 'power' and 'interest' dimensions will provide the basis to determine the appropriate level and technique of engagement. Notably, stakeholders will be subdivided across six groups, and core sub-groups of stakeholders will be identified for closer engagement throughout the project (e.g., via participatory workshops).

TRANSIENCE stakeholder engagement will be primarily structured along the project modelling phases. This will involve, in Phase 1, the mapping of project-relevant stakeholders, followed by the identification of the major industry transformation challenges via participatory workshops and selected interviews. In Phase 2, the same engagement tools will be employed to scope industry- and policy-relevant research questions with stakeholders. Further, online workshops and a survey will be used to validate the MIC3 satellite modules. Phase 3 will involve gathering stakeholders in a final round of workshops to validate the integrated MIC3 framework, as well as the dissemination of a survey to collect their feedback.

4. Evidence of accomplishment

This report and a stakeholder database (screenshots in the Annex; more on the database can be found in TRANSIENCE Milestone report MS4 'Stakeholder engagement database').

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Preface

The need to approach climate action, resource efficiency, and circularity performance as integrated, economy-wide, cross-cutting issues is growingly gaining attention in the policy world, stimulating the development of new industrial policies in Europe and worldwide. Currently, however, there is little progress in conceptualising the circular economy and understanding its interactions with climate action. State-of-the-art modelling capacity to capture the interplay of the two agendas and their implications for energy-intensive sectors as well as to represent the European industry's transformation in line with the region's vision for climate neutrality is not yet fully developed. TRANSIENCE will undertake a comprehensive characterisation and assessment of circularity principles and measures vis-à-vis decarbonisation, by looking at the twin transition of European industries through the lenses of global competitiveness, innovation, and holistic sustainability. It will then produce MIC3, a consistent, fully open-source model ecosystem to assess industrial circularity, decarbonisation, and sustainability. A series of interoperable modules on the socioeconomic, service and product, material, industrial, energy-system, and environmental perspectives of the transformation of European industry will be developed and integrated, building on and opening the code of leading modelling tools. MIC3 will finally be used in extensive scenario modelling to produce diverse pathways toward a material-efficient, circular, climate-neutral, sustainable European industry. Transparency, openness, and knowledge sharing will be promoted, and technical capacities will be developed in four industrial agglomerations in the EU, moving beyond stakeholder consultation, onto model co-development, continuous validation of assumptions, co-creation of scenario modelling, evaluation of the desirability and usability of the developed model and insights, and eventually co-production of science and action.

ICCS – Institute of Communication and Computer Systems	EL
CEPS – Centre for European Policy Studies	BE
E3M – E3-Modelling AE	EL
Fraunhofer – Fraunhofer Gesellschaft Zur Forderung Der Angewandten Forschung Ev	DE
HOL – HOLISTIC IKE	EL
PIK – Potsdam Institut Fur Klimafolgenforschung Ev	DE
PNTEC – Park Naukowo-Technologiczny Euro-Centrum Spolka z ograniczona odpowiedzialnoscia	PL
TECNALIA – Fundacion Tecnalia Research & Innovation	ES
UU – Universiteit Utrecht	NL
WI – Wuppertal Institut Fur Klima, Umwelt, Energie GGMBH	DE
PSI – Paul Scherrer Institut	CH
UCL – University College London	UK

Executive Summary

As the EU moves towards a circular and carbon-neutral economy, there is still limited technical understanding of the complex, cross-cutting implications this twofold transition will entail. The TRANSIENCE project sets out to explore these implications through a co-creative modelling process, which will result in the *Model for European Industry Circularity and Climate Change mitigation* (MIC3). A cornerstone of this process will be a comprehensive and transdisciplinary engagement of relevant stakeholders from industry, policy, the research community, and broader civil society. This deliverable outlines the TRANSIENCE stakeholder engagement strategy, serving as the main reference document for project partners to conceptualise, plan, and execute stakeholder engagement activities.

Effective stakeholder engagement will offer a wide range of benefits for both the project and stakeholders. In TRANSIENCE, specifically, it will allow researchers to capture and leverage stakeholders' firsthand knowledge, thereby identifying knowledge gaps and formulating relevant research questions to be explored and validated via participatory modelling. This will ensure the policy relevance of TRANSIENCE modelling outcomes, whilst promoting knowledge sharing and guaranteeing transparency and openness of the modelling process. While the levels and techniques of engagement will ultimately be based on stakeholders' interest in—and relevance for—the project, TRANSIENCE engagement activities will hinge upon credibility, relevance, and legitimacy as horizontal principles throughout.

The systematic mapping and grouping of project-relevant stakeholders will allow for tailoring TRANSIENCE engagement activities to stakeholders' importance for the project, as well as to their specific needs and requirements. The prioritisation of stakeholders based on 'power' and 'interest' dimensions will provide the basis to determine the appropriate level and technique of engagement. Given their wide heterogeneity, stakeholders will be further subdivided across six groups: four regional industrial clusters (i.e. *Basque Country cluster group*, the *Rhine-Ruhr cluster group*, the *Port of Rotterdam cluster group,* and the *Silesia cluster group*), an EU policy-focused group (the *Brussels group*), and an *overarching EU group* featuring a broader pool of stakeholders. Crucially, within each stakeholder group, a core sub-group will be selected and kept throughout the project for closer engagement (e.g., via participatory workshops).

TRANSIENCE stakeholder engagement will be primarily structured along the project phases. In Phase 1, a stakeholder mapping exercise will be initially carried out by all project partners to identify and categorise project-relevant stakeholders. The information and contact details of stakeholders agreeing to join the project will be securely stored in a GDPR-compliant database. Relevant stakeholders will then be engaged for the identification of the major industry transformation challenges via a combination of participatory workshops—one per stakeholder group—and selected interviews. Then, during Phase 2, participatory workshops and interviews with stakeholders will again be employed to scope industry- and policy-relevant research questions. These questions will then serve as a backdrop for validation of the MIC3 satellite modules, which will be done by means of online workshops and a survey. Finally, Phase 3 will involve gathering stakeholders in a final round of workshops to validate the integrated MIC3 framework, as well as disseminating a survey to collect their feedback on the usability and accessibility of MIC3.

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Acronyms and abbreviations

Abbreviation	Description
MIC3	Model for European Industry Circularity and Climate Change mitigation
CRELE	Credibility, relevance, and legitimacy
SAB	Scientific Advisory Board
CDE	Communication, dissemination, and exploitation

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1 Introduction

The transition towards a climate-neutral and more circular EU economy will entail disruptive, multifaceted, and intertwined implications across a multitude of sectors and actors. There is a need to approach these two transitions in an integrated manner to better understand the economy-wide and cross-cutting impacts for European industry. In this context, TRANSIENCE undertakes to co-explore these complex dynamics together with stakeholders through the co-creation of new modelling capacity, the co-design of new scenario modelling and, ultimately, the co-production of new evidence about the implications of diverse transition pathways for European industry. Committed to transdisciplinary research throughout all stages of the project, TRANSIENCE will ensure policy-relevant and meaningful results, promote knowledge sharing, and ensure transparency and openness.

This deliverable aims to present how the project will fulfil its commitment to transdisciplinarity in the form of a stakeholder engagement and co-creation strategy. The strategy will lay the foundation for robust, two-way engagement and co-creation between the consortium on the one hand and policy, industry, research, and civil society stakeholders on the other, throughout the project's lifespan and beyond. This deliverable will provide a reference document for project partners to plan and execute stakeholder engagement activities throughout the project.

The TRANSIENCE stakeholder engagement strategy will involve stakeholders in each phase of its process, with the aim to:

- leverage stakeholders' insights to identify knowledge gaps and research questions to which the modelling process can respond,
- capture the most pertinent questions related to decarbonisation, circularity, and overall sustainability from policy, industry, and societal actors to guide scenario analyses, and
- translate stakeholder needs into modelling capabilities and scenario narratives co-designed with stakeholders, in an iterative process of model validation and refinement.

This document will briefly introduce the multidimensional concept of stakeholder engagement, outline the basic principles of effective stakeholder engagement, discuss the benefits and objectives of TRANSIENCE stakeholder engagement, and provide a thorough explanation of the TRANSIENCE stakeholder engagement and co-creation strategy. In particular, Section 2 discusses the basic dimensions of stakeholder engagement and sets out cornerstone principles for effective engagement. Section 3 gives an overview of the criteria used to map, categorise, and group stakeholders. Section 4 outlines the operation of the TRANSIENCE stakeholder engagement process, covering in detail the stages of stakeholder engagement in each phase of the project.

2 Stakeholder Engagement: dimensions, principles, and objectives

Stakeholder engagement is a flexible and multidimensional term that captures a range of activities and interactions centred on persons or groups with an interest in, or who are affected by, a project, policy, or initiative (Richardson 2012; Parry et. al. 2007; Zimmermann & Maennling, 2007). This engagement may vary from low-level, non-interactive listening or information sharing activities (such as publication of newsletters, websites, or reports) to deeply interactive, two-way dialogues, and collaborations. The level of stakeholder engagement ultimately depends on the input needs of the particular project, policy, or initiative, as well as on the characteristics of the relevant stakeholders. Indeed, as further explained below, stakeholders might be engaged differently through project activities based on, e.g., the interest or willingness to engage, the level of influence over relevant processes, and/or the depth of knowledge in a relevant area (Zimmermann & Maennling, 2007).

2.1 Dimensions of stakeholder engagement

A systematic process of matching stakeholders to appropriate engagement techniques helps to navigate the varied landscape of stakeholder engagement. When selecting appropriate engagement techniques for a particular group of stakeholders, three dimensions are commonly considered (Yang et al., 2011; Mendelow, 1991):

- extent of **power** (or **influence**) of the stakeholder group over a given project domain,
- extent of **interest** of the stakeholder group in a given project, and
- appropriate **level of engagement** of the stakeholder group for achieving project objectives.

These dimensions enable a better understanding of stakeholder groups and of how each group should be engaged to achieve project objectives. Based on stakeholders' influence and interest, researchers can select the appropriate engagement level for each stakeholder group as well as engage stakeholders using techniques corresponding to that engagement level.

In general, the greater the power and interest of a particular group of stakeholders, the more deeply they should be engaged. This is because higher levels of engagement require more time and resources, which only high-interest stakeholders may be willing to expend. In addition, it may only be worthwhile to expend these resources for high-power stakeholders, given their greater influence over outcomes in the project domain. For the same reason, this type of engagement is also more feasible with a smaller pool of stakeholders. Therefore, a balance must be struck to efficiently and effectively engage all relevant stakeholder groups across the various levels of engagement.

Typically, engagement levels range from one-way informing at the lowest level toward two-way asymmetrical data collection, two-way symmetrical consulting, and joint co-creation at the highest level of engagement. While there exists some variation amongst proposals defining the particular levels of engagement, it is key to define engagement levels within a project to ensure a common understanding and execution of engagement activities. The levels of the TRANSIENCE stakeholder engagement process are briefly outlined below, along with example engagement techniques and their appropriate application.

At the lowest level of engagement, called the **inform** level here, possible engagement techniques include sending emails and newsletters, maintaining websites, or releasing publications. Because these techniques require less time and fewer resources, they are suitable for broad distribution of project information to large and varied groups of stakeholders. At the **collect data** level of engagement, interviews, surveys, focus groups, and public meetings can be appropriate engagement techniques. These entail higher commitment than informing techniques, so they are particularly suitable for stakeholder groups with a higher interest in project outcomes. Interviews additionally offer a chance to confidentially gather opinions of sensitive issues and to build rapport with stakeholders through more direct interactions. Surveys, on the other hand, offer an opportunity to systematically gather and record opinions from many individual stakeholders.

At the **consult** level of engagement, formal meetings and interviews offer an opportunity to present technical information to high-level stakeholders, as well as to gather opinions and build relationships in a more formal setting appropriate to engagement with these high-level stakeholders. Finally, at the **co-create** level of engagement, co-creative workshops, working groups, and partnerships allow the deepest engagement with stakeholders. Co-creative workshops, in particular, facilitate group brainstorming, open discussion, analysis, and robust development of recommendations and strategies through participatory exercises. Figure 1 illustrates the different levels of engagement, as well as the example engagement techniques corresponding to each level. As will be shown in subsequent sections, TRANSIENCE will use engagement strategies across these levels of engagement, tailoring engagement to stakeholders' interest and influence.

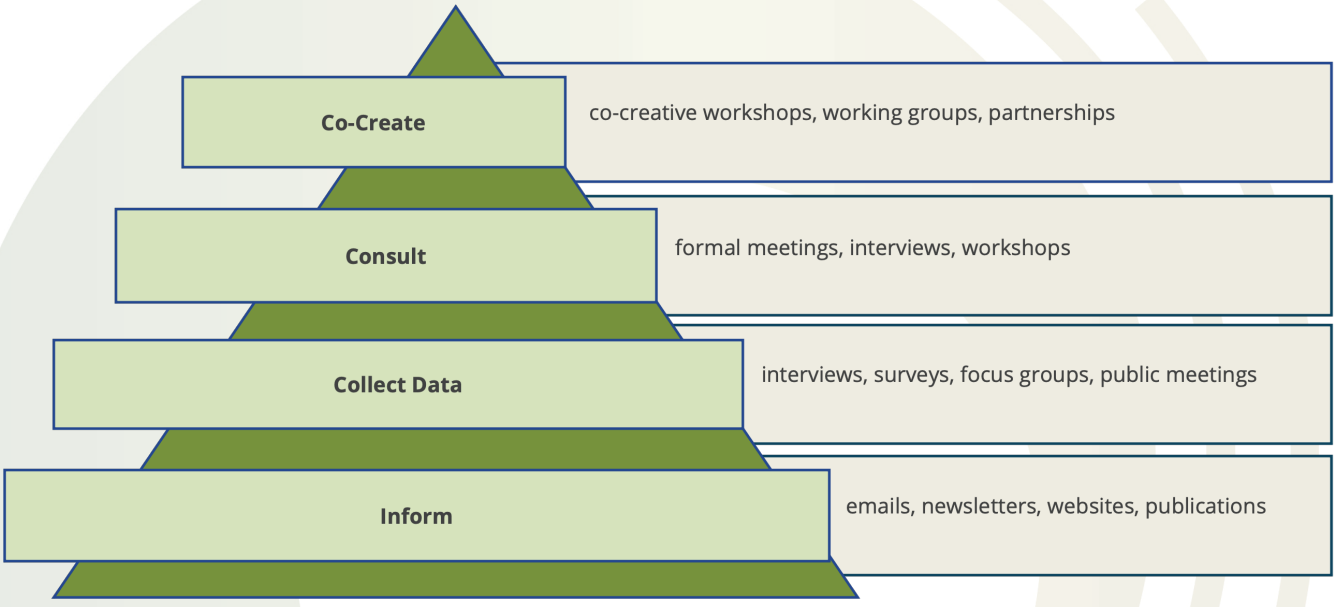


Figure 1. Engagement levels and example techniques adapted by authors.

2.2 Principles of effective stakeholder engagement

In order to assess the effectiveness of the complex and multidimensional stakeholder engagement process, particularly in the context of improving science-based decision making, it has been proposed to use the principles of **credibility, relevance, and legitimacy** (CRELE framework attributes) (Cash et al., 2003). Actively developing these CRELE attributes in stakeholder engagement can enhance a project's ability to

influence the behaviour of intended audiences by enhancing knowledge around consequences of decisions. As such, these attributes have often been considered the cornerstones of effective engagement at the interface of science and policy arenas (Sarkki et al., 2013). The three attributes are briefly described below.

- **Credibility** emphasises the quality and validity of the stakeholder engagement process and the knowledge produced, turning both on transparent selection of a balanced and representative pool of stakeholder participants and on their appropriate and continuous engagement to produce high-quality knowledge. The clear objectives and strategic methods for stakeholder engagement that TRANSIENCE sets out ensure this credibility.
- **Relevance** describes the usefulness of project outcomes to end-users, or responsiveness to societal needs and expectations. In the case of TRANSIENCE, the aim is to produce useful results for stakeholders across policy, industry, research, and civil society. Notably, model results will inform policymakers' and industries' transition strategies and civil society's future work, while model developments will orient towards their needs, also with the aim to inform future studies in the energy, climate, and sustainability modelling communities (thereby sustaining relevance). This will be achieved in TRANSIENCE through early participatory identifications of transformation challenges and stakeholder-driven scoping of research questions, as well as through iterative validation, ensuring that outputs are useful for stakeholders.
- **Legitimacy** emphasises fairness and balance in the stakeholder engagement process, especially in handling diverging values and interests. In TRANSIENCE, legitimacy is gained through open inclusion of a diverse set of policy, industry, research, and civil society stakeholders, drawn from across all possible levels. Legitimacy is further enhanced through a clearly defined process for selecting stakeholders and through reasoned application of appropriate techniques for engaging different stakeholder groups. Higher levels of stakeholder engagement, such as co-creative types of engagement, further reinforce legitimacy by promoting early and continuous engagement and meaningful integration of stakeholder input.

Although the CRELE attributes can be used to guide the design of effective stakeholder engagement, trade-offs and synergies between attributes require balancing attributes on a case-by-case basis. A clarity-complexity trade-off has been identified that pits relevance against credibility and legitimacy, for example. While simple, clear messages serve relevance by making outputs understandable for wide audiences, at the same time they sacrifice on credibility and legitimacy by simplifying or omitting systemic dimensions, uncertainties, or perspectives (Sarkki et al., 2013). TRANSIENCE manages this trade-off through development of a highly granular model with modules capturing all relevant transition perspectives (credibility), paired with interfaces tailored to expert and non-expert audiences and modelling results fit to users' profiles (relevance, legitimacy).

A speed-quality trade-off has also been identified between CRELE attributes. Capturing all perspectives (legitimacy) at the expense of timely responses to societal knowledge needs (relevance) is an example of this trade-off, as is ensuring that time-consuming quality assessments are done (credibility) at the expense of timely dissemination of knowledge (relevance) (Sarkki et al., 2013). In TRANSIENCE, this type of trade-off is addressed through ensuring that the range of perspectives is captured specifically with an emphasis on stakeholder knowledge needs (legitimacy and relevance). Similarly, TRANSIENCE centres stakeholder knowledge needs (relevance) in its validation processes (credibility), ensuring both timeliness and quality.

A trade-off between following policy demand (relevance) and exploring the full range of emerging issues or innovative solutions (credibility, legitimacy) is also relevant to the design of TRANSIENCE stakeholder engagement (Sarkki et al. 2013). Balancing this trade-off is inherent to the industrial transformations focus of TRANSIENCE, where there is a specific demand for knowledge on transformation pathways (relevance) and a wide range of stakeholders is at the centre of mapping these pathways (credibility, legitimacy).

Beyond balancing credibility, relevance, and legitimacy in the design of stakeholder engagement, implementation must also strive to be **iterative, flexible, and responsive** to correspond to the landscape of stakeholder engagement (Zimmermann and Maennling, 2007). Stakeholder engagement should begin early and be integrated throughout all phases of the project, with opportunities for reflection, evaluation, and adjustment throughout in order to incorporate perspectives and respond to changing conditions. As Section 4 will show, this principle, as well as CRELE-guided design, will be fully reflected within the TRANSIENCE co-creative modelling exercise.

2.3 Benefits and objectives of stakeholder engagement

In general, stakeholder engagement offers a myriad of potential benefits to project leaders, as well as to stakeholders and society at large. On the one hand, lower levels of engagement such as informational activities might lend a higher profile to the project, stir contacts for future engagement, or increase support for the project. For stakeholders, this kind of engagement presents opportunities for learning, ultimately improving decision-making and policies. Overall, this results in better knowledge being applied in policy and practice, benefitting the wider society. On the other hand, higher levels of engagement—such as *co-creation* processes—provide benefits across project leaders, stakeholders, and wider society by improving and deepening the analysis and by providing a sense of ownership and shared responsibility for research outcomes and decision-making across societal actors. These kinds of benefits accrue over the various levels of stakeholder engagement, reflecting the general objectives of stakeholder engagement to improve the **quality** of research and analysis and extend the **impact** of project knowledge and outcomes (Sarkki, 2013).

2.3.1 Objectives of stakeholder engagement in TRANSIENCE

In the context of the sociotechnical challenges of the 21st century, such as the transition toward a material-efficient, circular, climate-neutral, sustainable European industry, researchers are required to interact in a transdisciplinary way with end-users from across policy, industry, research, and civil society (Pade-Khene et al., 2013). Specifically, given the complexity of mitigating climate change and achieving circularity, there is a need for scientific and technical capacity to support integrated policy approaches to climate mitigation and circularity as cross-cutting, economy-wide issues (Nylén, 2019). However, the integrated assessment models (IAMs) upon which much of mitigation policy is based have so far suffered in a range of dimensions (Nikas et al., 2022), including fragmentation of mitigation and circularity perspectives (Pauliuk & Heeren, 2021), a lack of spatial or sectoral detail (van den Berg et al., 2019), and a lack of openness about assumptions and input data (Robertson, 2021).

In the light of these gaps, TRANSIENCE aspires to strengthen capacities for providing useful outputs for climate action, circularity performance, and broader industrial sustainability, with a focus on spatiotemporal, sectoral, and technological granularity. The TRANSIENCE project's commitment to co-creative, transdisciplinary, participatory modelling is key to delivering on this promise, bringing together diverse bodies of knowledge for holistic and action-oriented understanding of complex transformation

challenges (Land et al., 2012; McGookin et al., 2021). Indeed, moving beyond informing, collecting data, and consulting stakeholders, participatory modelling helps integrate a more diverse range of perspectives (Lang et al., 2012), identify concrete needs or blind spots (Süsser et al., 2022), and build ownership of problems/solutions and consensus on how to proceed (Waisman et al., 2019). Further, it allows development of policy- and industry-relevant, actionable solutions to the complex real-world problems, enhancing the legitimacy and validity of the results (McGookin et al., 2021), and making models more useful towards achieving greater policy impact (Süsser et al., 2021). In line with these merits, TRANSIENCE aims to achieve three core objectives through its stakeholder engagement process:

- **Ensuring that project results are policy-relevant, realistic, and responsive to all stakeholders** through model co-development, continuous validation of assumptions, co-creation of scenario modelling, evaluation of desirability and usability of model, and eventually co-production of science and action.
- **Promoting knowledge sharing** through an effective dissemination and exploitation mechanism.
- **Ensuring transparency and openness** through open access to the modules and model produced, through the provision of documentation and fit-for-audience user guides, as well as through the use and production of FAIR (findable, accessible, interoperable, and reusable) data.

The following section (Section 3) outlines the criteria used to map and group stakeholders, while Section 4 then describes in more detail the TRANSIENCE stakeholder engagement and co-creation strategy and demonstrates how it is motivated by these core objectives, as well as the dimensions and principles discussed above.

3 Mapping and grouping relevant stakeholders

An effective stakeholder engagement requires to target the relevant stakeholders and tailor, to the extent possible, engagement efforts to specific stakeholders' characteristics. This section outlines the conceptual framework underpinning the mapping and grouping of relevant stakeholders within TRANSIENCE. This provides the basis for then delving into the details of how and when different stakeholder groups will be engaged throughout the project (Section 4).

3.1 Stakeholder mapping

The first step of stakeholder engagement is to build the pool of project-relevant stakeholders via a comprehensive stakeholder mapping exercise. Stakeholder mapping (or 'stakeholder analysis') can be generally defined as the process that i) defines aspects of a social and natural phenomenon affected by a decision or action; ii) identifies individuals, groups, and organisations who are affected by or can affect those parts of the phenomenon; iii) prioritises these individuals and groups for involvement in the decision-making process (Reed et al., 2009). As such, the process of stakeholder mapping is typically structured along three major steps: stakeholder identification, categorisation, and prioritisation.

3.1.1 Identifying and categorising relevant stakeholders

The identification of project-relevant stakeholders requires, first, to define who the relevant stakeholders are. Within the project management literature, a *stakeholder* is typically defined as "an individual, group, or organisation who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio" (Miller & Oliver, 2015).

Given the wide thematic and geographical scope of the TRANSIENCE scientific process, in the selection of relevant stakeholders, priority will be given to **industrial actors heavily affected by energy, climate, and resource policy choices** (e.g., energy-intensive sectors such as iron, paper, and cement) and **policymakers dealing with energy, climate, or resource policy portfolios** (e.g., EU Directorates-General for Energy, Environment and Climate Action, national/regional energy regulators, etc.). Beyond these, other categories of relevant stakeholders include **actors from the research community and/or from civil society deeply involved in the EU decarbonisation and circularity debate** (e.g., think tanks, environmental groups, etc.). The list of stakeholder categories and sub-categories used in TRANSIENCE is reported in Table 1.

Table 1. Stakeholder categories and sub-categories in TRANSIENCE

Categories	Policymakers	Industry	Research	Civil society
Sub-categories	EU institution	Industrial association	University	NGO
	National govt, authority, regulator	Private company	Think tank	Labour union
	Regional/local government, authority, regulator	Financial institution	Project/research consortium	Consumers' organisation
	International institution	Other	Other	Other
	Other			

3.1.2 Prioritising stakeholders: the power - interest matrix

The identification and categorisation of project-relevant stakeholders provide a useful basis for planning and executing engagement activities. However, rating stakeholders' relevance allows for a more efficient targeting of engagement efforts (e.g., by matching the appropriate engagement technique—see Section 2.1). The third step of stakeholder mapping hence involves the prioritisation of stakeholders according to their (actual, potential, or perceived) importance for the project. One of the tools typically employed to prioritise stakeholders is the *power-interest matrix* (Mendelow, 1991; Bourne & Weaver, 2010). Based on this approach, and in line with the conceptual framework described in Section 2.3, each stakeholder is assigned a rating along two key dimensions:

- **Power** (or influence), which reflects the ability of a stakeholder to affect the project's outcomes. Highly powerful stakeholders include those able to significantly influence project implementation and completion, while stakeholders of low power do not have the capability of influencing the project—regardless of their willingness to do so.
- **Interest**, which indicates the level of interest that the stakeholder has in the project. While some stakeholders might perceive the project as being highly impactful for them (whether in positive or negative terms) and therefore be interested in affecting its outcomes, other—even powerful—relevant stakeholders might not.

Since, within TRANSIENCE, no stakeholder will have significantly more capacity than others in influencing the project's results, the *power* indicator will be meant to measure the level of influence and representativeness the stakeholder has within their respective domain (e.g., sector) and/or geographical scope (e.g., country), hence the potential relevance of their contribution in the co-creative modelling process.

It should be noted that the project is not interested in reproducing the current power structure (i.e., engaging only with 'powerful actors'), but rather in enabling all actors and processes, including those that are not *yet* powerful, to emerge in the transformation of European industry—hence this equal focus on 'interest' in our stakeholder engagement and co-creation strategy.

For the sake of simplicity, for both indicators the rating will be assigned on a binary scale (i.e., 'high' or 'low' power and 'high' or 'low' interest). Ultimately, the objective of stakeholder prioritisation is to divide and map relevant stakeholders into four groups, corresponding to the four quadrants of the power—interest matrix (see Figure 2). As shown in the figure, within TRANSIENCE, these four groups are then used to define and allocate to the most suitable level of engagement, and therefore the most appropriate engagement technique, across those identified in Section 2.3.

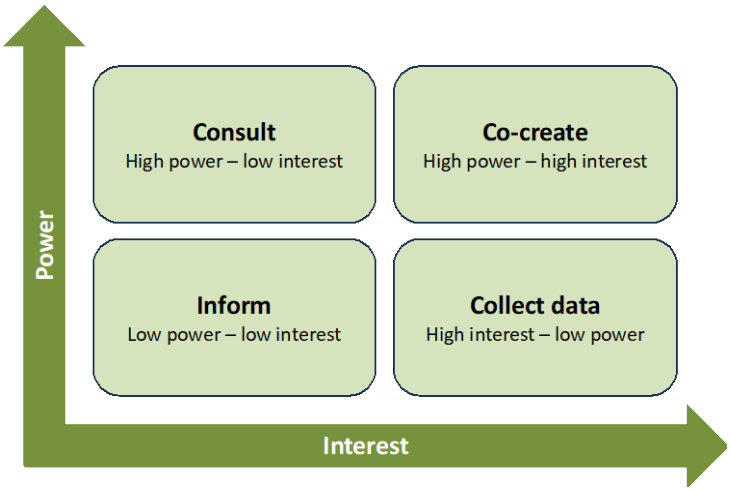


Figure 2. Power – interest matrix with levels of engagement within TRANSIENCE.

3.2 Defining stakeholder groups

In order to better structure stakeholder engagement activities during the project and across partners, as well as to further tailor these activities based on stakeholders' needs and concerns, a second layer of stakeholder subdivision will be considered in TRANSIENCE. This will primarily mirror the geographical attribute of stakeholders and the TRANSIENCE specific geographical areas of focus, featuring the six cross-category groups listed below:

- **Regional clusters groups (four groups)**. A key aspect of the TRANSIENCE participatory modelling exercise is to establish a close, interactive dialogue with four major regional clusters: the Basque Country industrial supercluster in Spain, the Rhine-Ruhr industrial cluster in North Rhine-Westphalia in Germany, the wider Port of Rotterdam industrial cluster in the Netherlands, and the Silesia industrial cluster in Poland. Therefore, four stakeholder groups will be built around these industrial clusters. These groups of stakeholders will be primarily selected and addressed by local partners, to rely on their deeper understanding of specific (local) engagement requirements and practices.
- **Brussels group**. The fifth stakeholder group comprises stakeholders from the EU policy circle, and notably from the energy, climate, and circular economy domains. This includes key policymakers from EU institutions or bodies, representatives of industrial associations, relevant research organisations focused on EU energy, climate, and circularity policy as well as any other relevant societal group having strong interest or stake in the EU energy, circularity, and climate policymaking process.
- **Overarching EU group**. The sixth group features all stakeholders not pertaining the regional clusters nor the Brussels groups yet deemed potentially informative for the TRANSIENCE co-creative modelling exercise. For instance, this group might include national or regional governments, global business groups or international institutions.

Within each group, stakeholders will be ranked and engaged according to the mapping exercise described in Section 3.1. Crucially, **core subgroups** comprising between 10 and 20 stakeholders—the 'high power, high interest' ones—will be identified for each group early in the project. These core stakeholder subgroups will be kept at the centre of the co-creation exercise and include the stakeholders (agreeing to be) more

closely engaged throughout the project, including via participatory workshops (see Figure 3 below).

Beyond the stakeholder groups described above, a **Scientific Advisory Board (SAB)** of scientific, industry and policy expert has been formed as part of the project to advise on matters related to the implementation and development of project activities. Although no *ad-hoc* engagement activities will be envisaged for SAB members, this group will be closely involved throughout the project.

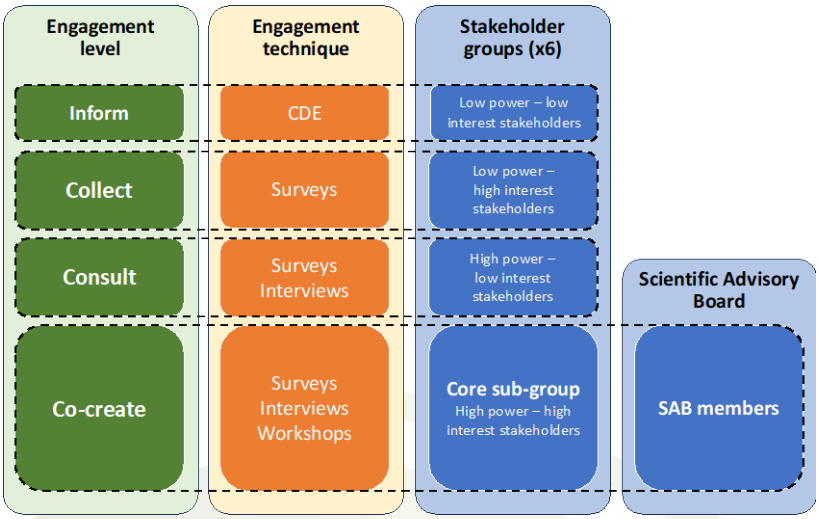


Figure 3. Allocation of stakeholder engagement level and technique across stakeholder groups.

3.3 Stakeholder database

Throughout the project, relevant stakeholder information and contacts will be stored in a stakeholder database, which will only be shared among project partners in an entirely GDPR-compliant format. While the pool of stakeholders will be continuously updated during the project, the structure of the database will be kept constant and include the variables indicated in Table 2.[1]

[1] For screenshots of the actual TRANSIENCE stakeholder database, see the Annex.

Table 2. List of variables included in TRANSIENCE stakeholder database.

Area	Variable	Categories
Basic Information	Stakeholder name	
	Contact name	
	Contact role	
	Country (HQ)	
	Level of activity	• Local • Regional • National • EU • Global
	Reference partner	
	GDPR form signed	• Yes • No
Contacts	Contact phone	
	Contact email	
Stakeholder category & group	Category	See sub-section 3.1.1
	Sub-category	
	Group	• Basque Country • Rhine-Ruhr • Port of Rotterdam • Silesia industrial • Brussels • Overarching EU • SAB
Stakeholder mapping	Power	• High • Low
	Interest	• High • Low

4 Stages of Engagement

This section outlines stages, means, and timeline of the TRANSIENCE stakeholder engagement strategy. Engagement will be primarily structured along the project's three phases, with different activities carried out in parallel across different stakeholder groups. At the end of this section, Table 3 summarises the strategy matching each engagement activity with its specific objective, targeted stakeholder group, responsible project partners, and project deliverables.

4.1 Stakeholders identification and initial engagement

As indicated in Section 3.1, mapping project-relevant stakeholders is a prerequisite to effective stakeholder engagement. In TRANSIENCE, stakeholder identification will primarily leverage on existing partners' networks and contacts, particularly within the EU energy-intensive industry and/or energy and climate policy circles. Contributions from all consortium partners will allow to garner a wide and heterogeneous sample of stakeholders. While an initial list of stakeholders—fed, among others, by inputs collected during a brainstorming session to be held during the first TRANSIENCE general assembly—will provide the basis for the initial engagement process, the list will be further complemented and updated throughout the duration of the project.

The categorisation and prioritisation of identified stakeholders will rely on the judgment of the partner responsible for their identification and will be based on the conceptual framework outlined in Section 3.1. An initial contact with potentially relevant stakeholders will allow partners to introduce the project's objectives and processes via a short briefing and determine their level interest in being involved in TRANSIENCE. Crucially, only stakeholders formally agreeing to be involved via the signing of a GDPR-compliant form will be added to the TRANSIENCE stakeholder database and be considered for engagement. At the end of the mapping process, a (preliminary) list of stakeholders will be available for project partners to initiate the actual engagement process within the respective stakeholder group (i.e., Phase 1 below).

4.2 Stakeholder engagement in three phases

The TRANSIENCE co-creative process will progress through the three project phases, with stakeholder engagement as a core cross-cutting activity flow throughout them. Notably, during the three phases, stakeholders will help to 1) identify transformation challenges facing EU industry, 2) co-develop industry- and policy-relevant research questions, and 3) validate the TRANSIENCE new modelling capacity and results. While the implementation of stakeholder engagement through these phases will rely on the discretion of the partners responsible for each stakeholder group, engagement will follow the general pattern envisaged in the sections below.

4.2.1 Identification of transformation challenges

In the first phase, stakeholders will be engaged for the identification and characterisation of the major transformation challenges faced by EU industry, including challenges related to technology or infrastructure, political or institutional constraints, economic considerations, or capacity limitations.

At this stage, stakeholder insights will be collected first via one **participatory workshop** for each regional cluster group, where core stakeholders will help frame cognitive maps showcasing existing real-world

interdependencies and feedback loops that impact decarbonisation and circularity pathways in each region. The results of these four regional workshops will then be discussed in a fifth interactive workshop in Brussels with core stakeholders from the EU policy and overarching EU groups to align outcomes with EU policy developments as well as the broader EU context. Follow-up **interviews** with selected stakeholders from the six stakeholder groups will complement the workshop mapping exercises, and stakeholder insights will be captured in a report (**D2.2**). The cognitive maps developed during the first phase will serve as a canvas for the open model development strategy in **D3.2**, ensuring that MIC3 modules and their integrated application can provide analysis relevant to the stakeholder-identified transformation challenges. They will furthermore provide a starting point for identifying key industry and policy research questions in the second phase, as well as for validating the MIC3 satellite modules in the third phase.

4.2.2 Scoping of industry- and policy-relevant research questions

The second phase will further strengthen transdisciplinary research with our stakeholders from across the four *regional industry cluster* groups, the *EU policy* group, and the *overarching EU* group through a second round of **participatory workshops** and complementary **interviews**. Again, there will be four regional workshops with *core* stakeholders from each *regional cluster* group followed by selected interviews with the broader groups of stakeholders. Finally, a parallel fifth workshop in Brussels engaging the *core EU policy* and *overarching EU* groups will incorporate the broader EU perspective. The aspiration is to engage the same individuals from the first round of workshops to promote continuation and depth of engagement while working to distil the relatively abstract identification of key transformation challenges into a more concrete list of policy and industry research questions to inform modelling. Each workshop will be documented, and the most salient of industry- and policy-relevant research questions will be synthesised in a report (**D8.3)**. These questions will serve as a backdrop for validation of the MIC3 satellite modules in **D8.2** and will inform the development of scenario frameworks for analysis using the integrated MIC3 model for **D11.1**.

4.2.3 Validation of modelling tools and results

In the final phase, stakeholders will help to validate the MIC3 satellite modules and integrated framework, including for usefulness and usability. The MIC3 satellite modules will be validated in a two-step process. An **online workshop** for *core* policymakers and industry representatives from each of the six stakeholder groups will bring together participants from previous workshops to review MIC3 module scenario analysis results (**D8.1**) and reflect on whether the results answer stakeholder questions and whether the format is useful and usable for informing industrial strategies and policies. This reflection will be facilitated by creation of two tailored interfaces—one advanced interface for modelling scientists and one guided interface for non-expert audiences. A **survey** will then be disseminated to a wide pool of relevant stakeholders to validate MIC3 modules in the context of various industries across Europe. For this, the I^{2}AM PARIS platform will be used to create custom visualisations of results tailored to each stakeholder's profile, considering the region and sector(s) of interest. Stakeholders will then reflect on the usefulness and accessibility of these specific results, providing feedback on individual preferences. Input from this module validation will be used to finetune the finalisation of the MIC3 modules in **D7.4**, while stakeholder preferences collected at this stage will inform CDE efforts**.**

In this last phase, stakeholders from all groups will also validate the MIC3 integrated framework (**D7.3**) and provide feedback on a MIC3-based simplified modelling tool (**D12.4**) through a final round of workshops

and surveys. In **workshops** organised for each of the four regional groups and the EU groups, a wider range of stakeholders will evaluate transformation pathways, modelled with MIC3, against stakeholder-envisioned pathways, identifying assumptions for new pathways to reduce divergence between these modelled pathways and the envisioned pathways. As before, a wide pool of relevant stakeholders from across the stakeholder groups will then review context-tailored results through interactive visualisations in I^{2}AM PARIS and complete a **survey** (**D11.5**) assessing these results in terms of usability and accessibility.

4.3 Risks and mitigation actions

During the project implementation some risks can be anticipated due to the involved nature of the co-creative process. The first risk relates to insufficient engagement from stakeholders. For example, senior-level stakeholders have oftentimes limited time availability, and so may not be able to commit the time necessary to engage in multiple rounds of workshops, interviews, and surveys. In some cases, stakeholders may not be responsive or may not provide constructive input. In order to mitigate these risks, TRANSIENCE partners will leverage well-developed networks, notably including outreach via the Processes4Planet partnership, as well as differing levels of engagement to lower barriers to participation. Parts of TRANSIENCE engagement will also take place online, further lowering barriers to participation. If issues continue to arise, stakeholders who are unable to participate adequately will be replaced with other stakeholders from the stakeholder pool.

A second risk refers to the lack of diversity in the stakeholder groups that respond to the various stakeholder engagement processes and especially to the workshops that are core for the co-creation process. For example, for some workshops there may be strong interest by industry stakeholders but very limited responses by representatives from research organisations, creating risks for having imbalanced views. If this risk occurs, the team will consult with its core group of stakeholders involved and its SAB to collect further suggestions for experts that can be involved. In some regional workshops there will also be the possibility of inviting experts from other regions to join online.

A third risk is that some participants—especially high-level—may bring forward confidentiality concerns regarding their contributions. To address this risk, the team will prepare detailed GDPR compliance forms explaining the process of collecting and handling data. If required, the research teams will organise separate bilateral discussions with senior experts having such concerns to explain the process of handling their data collected during the workshops, surveys, etc.

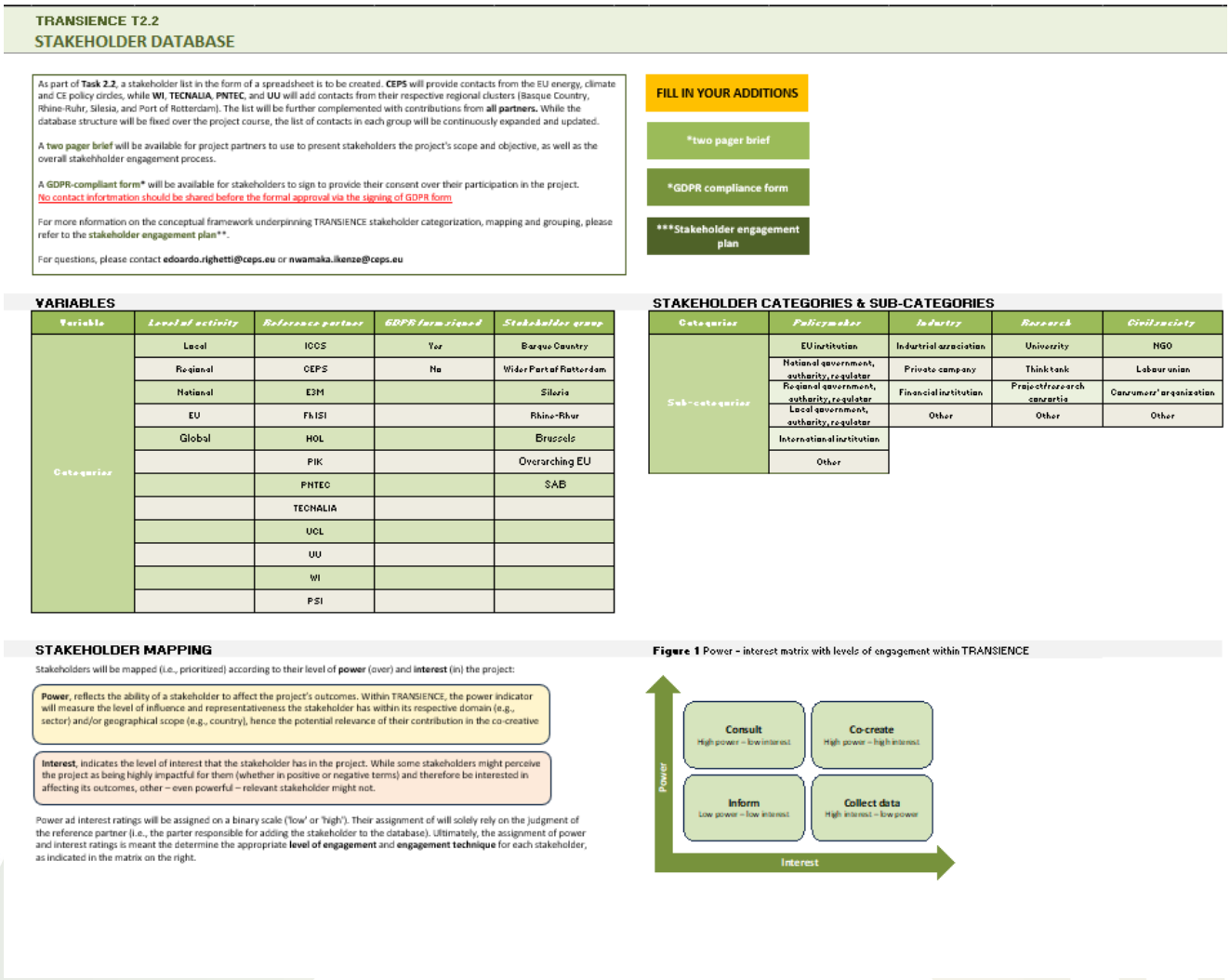
Table 3. An overview of the TRANSIENCE stakeholder engagement plan

Project phase	Activity	Objective	Engagement technique / tools	Targeted stakeholders	Responsible partner(s)	*Tentative* timeline	Task(s)	Deliverables /milestones
Phase 1	Development of a stakeholder engagement and co-creation strategy	Set out a strategy describing the means, timeline, and overall requirements for actively engaging stakeholders throughout the project.	n/a	n/a	CEPS	M1-M4	T2.1	D2.1
	Stakeholder mapping & initial contact with relevant stakeholders	Develop of a comprehensive database of project-relevant stakeholders	Phone/email correspondence	All relevant stakeholders	CEPS with inputs from all partners	M1-M6	T2.2	MS4
	Co-identification of transformation challenges	Map clusters-specific transformation challenges of technical, economic, political or awareness nature and vantage points to address them via MIC3.	Regional workshops (1 x cluster)	Core regional clusters groups	TECNALIA	M5 (TBC)	T2.3	D2.2
					WI	M6 (TBC)		
					UU	M7 (TBC)		
					PNTEC	M9 (TBC)		
			Interviews/ bilateral exchanges	Regional clusters groups	TECNALIA, WI, UU, PNTEC	M4-M9		
		Ensure alignment with EU policy discussion and broader EU context	EU workshop	Core Brussels group, core overarching EU group	CEPS with inputs from all partners	M10 (TBC)		
			Interviews/ bilateral exchanges	Brussels group, overarching EU group		M4-M10		
Phase 2	Scoping of policy and industrial research questions for scenario analysis	Define concrete list of real-world policy and industry-related questions to be explored for validating the individual modules and then the MIC3 framework.	Regional workshops (1 x cluster)	Core regional clusters groups	TECNALIA	M19 (TBC)	T8.1	MS14 D8.3
					PNTEC	M21 (TBC)		
					UU	M22 (TBC)		
					WI	M23 (TBC)		
			Interviews/ bilateral exchanges	Regional clusters	WI, TECNALIA, PNTEC, UU	M19-M23		
			EU workshop	Core Brussels group, Core		M24 (TBC)		

				overarching EU group	CEPS with inputs from all partners			
			Interviews/ bilateral exchanges	Brussels group, overarching EU group		M19-M24		
	Validation and desirability of individual modules	Collect validation feedbacks from stakeholders on usability and usefulness of modelling results from MIC3 satellite modules	Online workshops	Core regional clusters groups	WI, TECNALIA, UU, PNTEC	M29 (TBC)	T8.3	D8.2
						M30 (TBC)		
						M33 (TBC)		
						M33 (TBC)		
				Core Brussels group, Core overarching EU group	CEPS with inputs from all partners	M34 (TBC)		
			Survey	All relevant stakeholders	HOL	M29-M34		
Phase 3	Validation of the integrated MIC3 framework	Validate modelled pathways and identify assumptions for new pathways	Regional workshops (1 x cluster)	Core regional clusters	WI	M45 (TBC)	T11.5	D11.5
					TECNALIA	M46 (TBC)		
					UU	M47 (TBC)		
					PNTEC	M47 (TBC)		
		Review results based on stakeholders' context	Survey	All relevant stakeholders	HOL	M37-M48		
	Dissemination of project's output		Public event	All stakeholders	CEPS	M48	T12.3	

ANNEX

Figures A.1 and A.2 show screenshots of the TRANSIENCE stakeholder database, which will be employed throughout the project.



TRANSIENCE T2.2
STAKEHOLDER DATABASE

As part of **Task 2.2**, a stakeholder list in the form of a spreadsheet is to be created. **CEPS** will provide contacts from the EU energy, climate and CE policy circles, while **WI**, **TECNALIA**, **PNTEC**, and **UU** will add contacts from their respective regional clusters (Basque Country, Rhine-Ruhr, Silesia, and Port of Rotterdam). The list will be further complemented with contributions from **all partners.** While the database structure will be fixed over the project course, the list of contacts in each group will be continuously expanded and updated.

A **two pager brief** will be available for project partners to use to present stakeholders the project's scope and objective, as well as the overall stakehholder engagement process.

A **GDPR-compliant form*** will be available for stakeholders to sign to provide their consent over their participation in the project.
No contact information should be shared before the formal approval via the signing of GDPR form

For more information on the conceptual framework underpinning TRANSIENCE stakeholder categorization, mapping and grouping, please refer to the **stakeholder engagement plan****.

For questions, please contact **edoardo.righetti@ceps.eu** or **nwamaka.ikenze@ceps.eu**

FILL IN YOUR ADDITIONS
*two pager brief
*GDPR compliance form
***Stakeholder engagement plan

VARIABLES

Variable	Level of activity	Reference partner	GDPR form signed	Stakeholder group
Categories	Local	ICCS	Yes	Basque Country
	Regional	CEPS	No	Wider Part of Rotterdam
	National	E3M		Silesia
	EU	FhISI		Rhine-Rhur
	Global	HOL		Brussels
		PIK		Overarching EU
		PNTEC		SAB
		TECNALIA		
		UCL		
		UU		
		WI		
		PSI		

STAKEHOLDER CATEGORIES & SUB-CATEGORIES

Categories	Policymaker	Industry	Research	Civil society
Sub-categories	EU institution	Industrial association	University	NGO
	National government, authority, regulator	Private company	Think tank	Labour union
	Regional government, authority, regulator	Financial institution	Project/research consortia	Consumers' organization
	Local government, authority, regulator	Other	Other	Other
	International institution			
	Other			

STAKEHOLDER MAPPING

Stakeholders will be mapped (i.e., prioritized) according to their level of **power** (over) and **interest** (in) the project:

Power, reflects the ability of a stakeholder to affect the project's outcomes. Within TRANSIENCE, the power indicator will measure the level of influence and representativeness the stakeholder has within its respective domain (e.g., sector) and/or geographical scope (e.g., country), hence the potential relevance of their contribution in the co-creative

Interest, indicates the level of interest that the stakeholder has in the project. While some stakeholders might perceive the project as being highly impactful for them (whether in positive or negative terms) and therefore be interested in affecting its outcomes, other – even powerful – relevant stakeholder might not.

Power ad interest ratings will be assigned on a binary scale ('low' or 'high'). Their assignment of will solely rely on the judgment of the reference partner (i.e., the parter responsible for adding the stakeholder to the database). Ultimately, the assignment of power and interest ratings is meant the determine the appropriate **level of engagement** and **engagement technique** for each stakeholder, as indicated in the matrix on the right.

Figure 1 Power - interest matrix with levels of engagement within TRANSIENCE

Figure A.1 Screenshot of TRANSIENCE stakeholder database – 'Overview and guidelines' sheet.

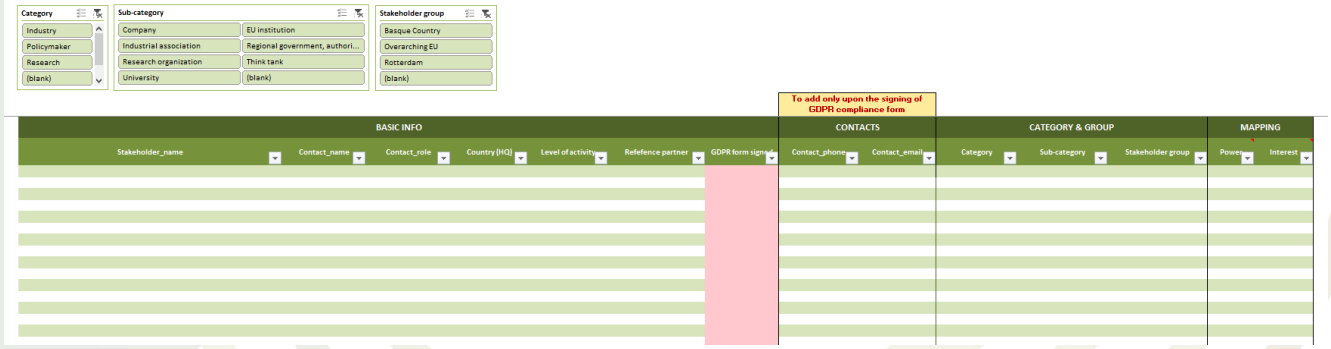


Figure A.2 Screenshot of TRANSIENCE stakeholder database – 'Database' sheet.

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