

## **D5.1 Policy Brief 2**

### **Guidelines for establishing a co-creation-based open science framework**

**Monitoring, Validation and Evaluation for the Knowledge Transfer (WP5)**



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## Executive Summary

Co-creation in the spirit of a more inclusive view on open science is an approach to research that applies the notion of open inquiry as the main driver of innovation to the entire research life cycle. The approach seeks to incorporate stakeholder participation to maximise the efficiency and effectiveness. In the context of the wider Responsible Research and Innovation (RRI) framework inherent in the European Commission's Science with and for Society (SwafS) programme, the TeRRIFICA project has implemented a bottom-up open science approach, conducting and evaluating co-creation events in pilot regions across Europe. These activities have yielded the following policy recommendations for stakeholders involved in R&I endeavours:

### Stakeholder commitment as a prerequisite

Identifying, selecting and recruiting stakeholders is an important step. However, the effectiveness of co-creation activities depends on the level of stakeholder engagement. Beyond engagement in the R&I process itself, (semi-)formal agreements with willing stakeholders are a way of promoting stakeholders' commitment to follow an action plan or implement policies that are based on the project results and outputs, ensuring pathways for impact.

### Strategic considerations

#### *1. Acknowledge multi-stakeholder expertise*

Commitment to the co-creation process simultaneously requires balanced power dynamics between participating stakeholders. Stakeholder knowledge and diverse forms of experience and expertise must be equally acknowledged and incorporated into the R&I process.

#### *2. Facilitate participation at all stages*

While the co-creation process can be guided by dedicated facilitators or public engagement experts, equitable participation of all stakeholders should be ensured throughout the whole R&I process. Ideally, this begins with the R&I agenda-setting, over the research implementation, to defining action plans based on the results and outputs.

#### *3. Address various needs and attitudes with a diverse range of formats*

Using a variety of formats and methods for co-creation can make the process more inclusive as different approaches will consider different stakeholder needs, perceptions, concerns, etc. This requires research on specific stakeholder needs and attitudes.

#### *4. Apply learnings from other co-creation projects*

Applying best practice in co-creation projects based on prior research and experience can boost the odds of success. Results and experiences from similar projects can be gained by reviewing peer-reviewed evaluation studies and engaging with other projects or initiatives. Collaboration with other projects and experienced co-creation specialists can also be beneficial.



## Implementation, tools and resources

### *1. Enhancing participation through strategic partners*

Recruiting a stakeholder base for participation may be challenging. A helpful first step can be to look for organisations, communities or gatekeepers that are open to engaging with one's project. An opportunistic approach to developing such relationships is often needed, when there are no existing links to build on.

### *2. Collaborate with strategic partners*

In the project's execution phase, collaboration with strategic partners makes use of synergies in communication and joint events. Co-creation projects should adapt their events/activities to align with partners' priorities, events, formats, and schedules. Co-releasing publications with partners and strategic use of social media can build and strengthen the network with partners.

### *3. Incorporate local expertise*

Local expertise should be incorporated in co-creation activities and project outputs that are primarily originating outside the participating community's context. Doing so can complement and contextualise generic expert or scientific knowledge, improving stakeholder engagement outcomes.

### *4. Employ easy-to-use participation tools*

Tools facilitating co-creation (e.g., crowd-mapping platforms for community-based data collection) should be intuitive and easy to use in order to remove user experience barriers that inhibit project efficiency. Any necessary user guidance should be embedded in the tool.

### *5. Promote open, transparent and free access to resources*

R&I data and outputs should be released openly in a transparent, and freely accessible manner. Contents should be designed and written in a way that is clear and digestible. This way, stakeholders can access these resources independently, widening the scope for practice and policy impacts to develop. This sort of proactive open access can streamline and facilitate evidence-based decision-making.



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# **Deliverable 5.2**

## **Policy Brief II**

### **Guidelines for establishing a co-creation-based open science framework**



## 1. The TeRRIFICA Project

In 2018, the European Commission described its vision for a new EU long-term strategy for reducing greenhouse gas emissions, setting out clear priorities to achieve a net-zero carbon economy in 2050. The TeRRIFICA project developed a response and is enabled by European Commission funding.

Through workshops and regional and international summer schools, TeRRIFICA empowers local citizens and is collaboratively developing adequate solutions to local climate change-related problems. Field trips to local and regional activities related to research and innovation, and broader stakeholder engagement with feedback loops are taking place (with limitations due to the current pandemic). Enabled by co-creation-based multi-stakeholder approaches, participants have the opportunity to expand their knowledge around climate change and innovative climate action and to identify opportunities, drivers, and barriers of implementation. Activities take into account challenges for the acceptance and feasibility, technological, and regulatory constraints in six pilot regions.

About four years into the project, TeRRIFICA has developed recommendations for tailored roadmaps and key performance indicators, aiming to implement established methodologies and climate change adaptation and mitigation activities in regional practice. This Policy Brief addresses decision-makers in organisations engaged in, or searching to engage in, multi-stakeholder research endeavours. Concrete policy recommendations are based on [project outcomes and results](#), and seek to help establish sustainable participatory research and innovation frameworks. Decision-makers can use these guidelines to implement policies that ensure sustainable co-creation practice (e.g., through formal requirements).





## 2. Literature Background

Collaborative research that addresses societal needs is highly relevant in the face of global crises such as climate change. Stakeholder involvement is even more relevant considering that these crises tend to be contextual, local, and often require societal change (Gardner et al., 2009). For implementing Responsible Research and Innovation (RRI) in general (see e.g., Owen, Macnaghten & Stilgoe, 2012; Stilgoe, Owen & Macnaghten, 2013), participatory approaches are crucial as “people increasingly acknowledge that local experimental or applied knowledge can enrich the quality and impact of investigations. The work is more responsive, socially relevant and connected to affected communities” (Durose, Richardson & Perry, 2018). Public engagement in itself is a core element of RRI, as “[e]ngagement is the process of building relationships with people and putting those relationships to work to accomplish shared goals, i.e., involving those who are at the heart of the change we wish to see” (Tandon et al., 2016, p.28).

Arnstein’s (1969) ladder of participation illustrates different degrees of citizen participation, where informing or consulting only describes a first symbolic level. Desirable higher levels of participation relate to power delegation or even citizen control.

However, co-creation with a variety of stakeholders (that is, “any group or individual who can affect or is affected by the achievement of the organisation’s objectives” [Freeman, 1984, p. 46]) can be highly complex - many barriers have been identified for advanced multi-stakeholder collaboration (see e.g., Millot et al., 2013), many of which can be addressed by well-designed institutional frameworks (Næss et al., 2005; Tol, 2005) as they define incentives for economic and political decision-making, capable of regulating special interests (North, 1991). Simultaneously, this can enhance innovation and increase environmental and business performance (Huang Lachmann & Lovett, 2016).

Fraaije and Flipse (2020) have created an implementation framework for RRI based on a review of the available literature on the concept of RRI. For each of the RRI dimensions (i.e., transparency, inclusion, reflexivity, anticipation and responsiveness), they summarised process qualifiers. Fraaije and Flipse also provide general recommendations such as the implementation of multiple, coupled activities throughout the research process that incorporate all RRI dimensions.

Through lessons learned from the TeRRIFICA project, we provide policy recommendations and practical insights from participative climate change mitigation and adaptation initiatives that apply and complement the existing theoretical frameworks.



### 3. Recommendations

This section provides practical policy recommendations for implementing and leveraging participatory research and innovation (R&I) approaches across a diverse range of stakeholders, beyond the boundaries of the dominant open science discourse that limits the definition of open science to transparency and open access (e.g. Crüwell et al., 2019). These policies – aimed to be implemented by research-performing organisations, policy-makers, government agencies, non-governmental organisations, or other civil society organisations – ought to help research and innovation systems address societal challenges more efficiently and effectively. The recommendations are built on available research and literature, and are largely based on the TeRRIFICA project’s co-creation activities and outputs.

The recommendations fall under three major clusters. The first point relates to stakeholder commitment as a basic prerequisite for effective co-creation. The following cluster includes strategic considerations aiming at maximising the effectiveness of the co-creation process through a well-founded communication framework. The implementation itself is the focus of the third cluster, which includes recommendations for concrete one-way and two-way communication activities using specific types of tools and resources as means to facilitate various stages of the co-creation process.

#### Stakeholder commitment as prerequisite

Stakeholder engagement is a basic requirement for any co-creation initiative to occur in the first place. However, beyond the identification, selection and recruitment of stakeholders, the degree with which stakeholders engage and commit influences how effective the co-creation process is at achieving the desired impacts. Thus, while acquiring stakeholders’ willingness to participate in the first place lays the groundwork for the activity to unfold, maximising impact relies on their commitment to an impact pathway. That is, impact can only be ensured if stakeholders commit to a way of translating the outputs or results of the process into concrete macro-level agendas for R&I, policies, regulations, etc., depending on the stakeholder type.

In order to enhance participation, it is advised to conduct an initial briefing with stakeholders that clarifies the purpose of the co-creation format and that also clarifies the importance of generating multi-stakeholder trust in the long term. At the same time, the importance of stakeholder commitment for mutually beneficial impacts should be highlighted. Naturally, the stakeholder pool might vary throughout the project; conducting multiple briefings at different stages of the project might thus be necessary. Following such a briefing, commitments to impact pathways can be established through (semi-) formal agreements within the group of collaborators.

This recommendation draws on the experience from TeRRIFICA initiatives in the Barcelona metropolitan area, where concrete ties to stakeholders such as local authorities would have improved the implementation of action plans and thus project impact.



## Strategic considerations

### *1. Acknowledge multi-stakeholder expertise*

Commitment to the co-creation process at the same time requires balanced power dynamics between the different participating stakeholders and stakeholder types. Often, researchers or experts in a particular field claim the entirety of expertise for themselves and see the participation format as a means to educate other stakeholders such as citizens. This mentality presumes a unilateral deficit in understanding that needs to be solved before informed decisions can be made.

However, balanced power dynamics ensure that different stakeholders' experience and expertise can be equally considered in the process of pursuing common goals. Thus, it is not only mutual learning, but also effective co-creation that can be fostered as a means of providing well thought-out and finely tuned solutions to local issues.

In sum, it must be commonly acknowledged that different stakeholders may have diverse forms of experience and expertise, which can in concert improve the R&I process and the conceptualisation and implementation of action plans, policy, etc.

From the analysis of the French TeRRIFICA pilot region, for instance, we know that the skills needed to identify and validate the effects of climate and then propose solutions and action plans are distributed among different types of stakeholders.

### *2. Facilitate participation at all stages*

While the co-creation process can be guided by dedicated facilitators or public engagement experts, equitable participation of all stakeholders should be ensured throughout the whole R&I process. Ideally, this begins with the R&I agenda-setting itself, over defining the research questions or project objectives, deliberating on the methodology, collecting and analysing data if applicable, interpreting and contextualising the projects' results, to defining an action plan that maximises impact. TeRRIFICA's crowd-mapping activities have shown that indeed, there is even considerable overlap between citizens' and experts' conclusions, particularly when it comes to the practical implementation of research results.

Generally, the involvement of stakeholders in all stages of the co-creation process also ensures that all parties are aware of on-going developments that are relevant to the process. As such, stakeholders can collectively and efficiently address any upcoming issues.

### *3. Address various needs and attitudes with a diverse range of formats*

Different stakeholders are likely to have different needs and attitudes, which can only effectively be considered through an equally diverse range of formats and methods. Utilising this variety in a targeted manner can make a co-creation project more inclusive as multiple approaches can take into account different stakeholder needs, perceptions, concerns, etc. more directly.



TeRRIFICA work employed a range of methods to co-create a climate change adaptation plan for Poznań Metropolis. The identification, communication and discussion of local climate issues, as well as the development of solutions to those issues were tackled by using a crowd-mapping tool, online workshops in the world café format, and individual communication channels. The multi-approach system was valuable for effectively diagnosing the current state and planning activities that empower climate change adaptation within the Poznań Agglomeration.

However, deciding on the most appropriate and effective co-creation formats can only be done after preparatory research – i.e., acquiring an accurate understanding of the stakeholders involved. Therefore, evaluation (e.g., in form of stakeholder analysis) is necessary to ascertain stakeholder needs and attitudes. Additionally identifying stakeholders' perceived obstacles to, and drivers of, specific co-creation endeavours can help remove precisely these obstacles and promote the drivers. This sets an emphasis on value systems in R&I that can enhance efficiency and effectiveness in achieving set objectives.

TeRRIFICA work recognised that some stakeholder needs result from the lack of participation or shareholding structures, a lack of dialogic culture, reluctance to compromise, and special interests, which counteract the issues co-creation processes aim to solve.

#### *4. Apply learnings from other co-creation projects*

Applying best practice in co-creation projects based on prior research and experience can generally boost the odds of success. Apart from drawing on available scholarly literature such as peer-reviewed evaluation studies, results and experiences from similar projects may provide valuable input that could improve one's own practices. Gaining this type of special insight often requires engagement with other initiatives, which can additionally lead to collaborations that involve aligning goals and jointly working towards them by exchanging and applying best practice and lessons learned in shared action plans and activities.

Learning from other projects and collaborating can increase efficiency and effectiveness as more participants become involved in civic and social participation. This, in turn, can lead to enhanced impacts of co-creation activities, including the implementation of policies, increased local interest, awareness, knowledge and skills, as well as positive behaviour change. In the long term, stakeholders' willingness to initiate or engage in participatory initiatives can be an additional, self-perpetuating effect.

From an early stage on, TeRRIFICA was connected to other EU-funded EC / SwafS-projects on RRI-related topics, especially on how to monitor responsible R&I in policies and practices. These efforts were initiated through the [SuperMORRI](#) project, or for joint workshops and presentations (e.g., at the European Week of Regions and Cities).

Beyond the macro- and meso-level implications of collaborating with other projects, data and results can be used by the extended co-creation network to develop impacts beyond one's own project goals or objectives.



For instance, the TeRRIFICA project's crowd-mapping data will be used by youth project groups to prepare local climate mapping reports in Minsk, and youth councils of housing estates and villages will utilise their collected data as input for updating and monitoring the Climate Change Adaptation Plan for Poznań Agglomeration.

Additionally, the crowd-mapping tool gained interest among the Spanish Provincial Council of Girona and mayors of different municipalities at a national dissemination event as a potential means to obtain data in support of their public policies.

Thus, collaboratively gained knowledge and data may be a starting point for formulating arguments during eco-debates, and will help create projects for the Civic Eco-Budget to implement measures supporting adaptation to climate change in schools or their immediate surroundings.

## Implementation, tools and resources

### *1. Enhance participation through strategic partners*

In the first stages of a project – that is, before it is completely established, practically approaching and encouraging stakeholders to participate in projects can be challenging. A helpful first step can be to look for organisations, communities or gatekeepers that are open to engaging with one's project. Developing strategic partnerships with such organisations and individuals can offer wider access to stakeholders. Such strategic partners may already have established a relationship of trust with stakeholders or stakeholder groups that are relevant for the intended co-creation project. The German TeRRIFICA pilot region "Oldenburger Muensterland" has identified a set of practical guidelines from working with local heritage communities and organising regional workshops, a summer school and climate tours.

Strategic partners do not necessarily have to be directly involved in the issues relevant to the intended project but merely need to have an open and interested community who is willing to participate in the project. Particularly groups who have been strongly engaged in offline communities in the past are worth reaching out to. Finding strategic partners and stakeholders may require utilising certain windows of opportunity for engagement. That is, following local news via newspapers and relevant social media, participating in upcoming events and city council meetings, talking to locals, and getting in touch with community groups once opportunities arise.

Reaching out to potential stakeholders or strategic partners over the phone or even in person have shown to be considerably more effective than through email exchange as emails get overlooked too easily and are less binding than a direct interaction. The former two options are also more personal and engaging than the latter. It is helpful to elaborate on why their participation is relevant and why their particular expertise would be valued. TeRRIFICA partners also found it effective to offer to contribute to, or become part of, potential partners' or stakeholders' processes.



## *2. Collaborate with strategic partners*

Drawing further on experiences from TeRRIFICA's German pilot region, in the execution phase of the project, it was proven that collaboration with strategic partners increases synergies in communication and facilitates joint events. Co-creation projects should adapt their events/activities to align with partners' priorities, events, formats, and schedules. For instance, projects can contribute communication and participation activities to partners' regular or planned events instead of organising and promoting a separate and independent project activity. This requires acquiring an early overview of partners' regular and upcoming events as well as important public events in the region.

In this sense, the Spanish TeRRIFICA pilot region included the Barcelona Metropolitan Authority in the planning and implementation of some joint actions that have allowed to reach a larger number and more influential stakeholders. This, in turn, enabled the development of highly targeted activities as well as the coordinated dissemination of information about these activities through social networks.

Collaboration in the dissemination of project information can also benefit from the strategic use of links and hashtags on social media to build and strengthen the network with partners and to reach a wider audience within relevant communities. At the beginning of the project, it is advised to explore the social media landscape proactively and identify useful social media profiles and hashtags. Strategic partners' regular publications (e.g., newsletters, white papers, yearbooks, homepage) are also important platforms for project dissemination. Coordinated efforts can include partners promoting each other's project work or even managing and releasing a joint publication.

## *3. Incorporate local expertise*

Through the TeRRIFICA climate tours in the German pilot region, we found that local knowledge helped advance co-creation activities. Local expertise showed to be particularly present among elderly community members. This kind of expertise should be incorporated in co-creation activities and project outputs that are primarily originating outside the participating community's context. Community expertise complements what is traditionally known as expert or scientific knowledge. It additionally helps contextualise academic work into the local environment, thereby facilitating and enhancing evidence-based decision-making.

For instance, local knowledge about changes in the regional landscape and the towns' and villages' built environment was seen as relevant in TeRRIFICA's observation of climate change effects and discussions around climate change adaptation.

Furthermore, inquiring about community expertise can initiate stakeholder engagement. The process of incorporating local knowledge can also help communicate the underlying purpose of the co-creation project, its goals, and ultimately, enhance the perceived relevance of project outputs.



In fact, TeRRIFICA has made the experience that stakeholders with relevant knowledge tend to be more open and eager to share their knowledge, and appreciate being part of the co-creation project. However, some stakeholders with local knowledge are not necessarily aware of the relevance of their expertise and must first be encouraged to share.

#### *4. Employ easy-to-use participation tools*

The use of tools such as the crowd-mapping tool employed in the TeRRIFICA project often require expert guidance, which was considered as a barrier to stakeholder empowerment and, potentially, collaborative data collection. Therefore, to avoid a decrease of the project's efficiency and effectiveness by limiting the project results and the impacts developed from project outputs, TeRRIFICA identified the importance of, and need for, intuitive and easy-to-use tools designed to facilitate co-creation processes – and concludes, where guidance is nevertheless necessary, that it should be incorporated into the tool to maximise stakeholders' independent ability to use the tool.

#### *5. Promote open, transparent and free access to resources*

The level of implementation of open resource policies (e.g., open data) is not homogeneous across Europe. Although the importance of such policies is increasingly recognised – particularly when it comes to publicly funded R&I, true commitment is often still lacking. TeRRIFICA work has shown that disclosing R&I outputs in a transparent and freely accessible manner can generally streamline and facilitate evidence-based policy and practice.

For instance, in Belgrade, the crowd mapping tool results were first met with scepticism. The main concern was the quality of the gathered data. During the open and transparent co-creative work, the scepticism vanished, and new opportunities arose. For the TeRRIFICA project, it is thus mandatory to make data accessible free of charge, and we have directly experienced the benefits of doing so: TeRRIFICA's data are being used by stakeholders independently from this project, and are contributing to local policy and practice impacts beyond the scope of TeRRIFICA.

In Barcelona, during TeRRIFICA's participation in events related to the Erasmus+ [SavingScapes](#) project, the need for access to a crowd-mapping open data which would enable its application by public administrations and third parties was highlighted.

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