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APPROACHES TO PARTICIPATORY POLICYMAKING PROCESSES:

Technical Report

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1. Introduction

Participatory policy making processes or participatory governance have become increasingly popular as a guiding principle for designing national strategies and policies, including those intended to promote industrial development. Milberg et al. (2014), for example, assert that achieving industrial upgrading within global value chains (GVCs) in ways that translate into sustainable domestic social gains—which the authors refer to as ‘joint economic and social upgrading’—requires “multi-stakeholder initiatives and linkages between commercial firms, workers and small-scale producers” (Milberg et al., p.172); hence, it is possible to balance gains across employment and wage growth, on the one hand, and improved labour and environmental standards, on the other hand. Santiago (2018) finds that multi-stakeholder participatory processes represent a basic tenet of strategy setting and policy responses to the Fourth Industrial Revolution in middle-income countries. Such multi-stakeholder approaches reflect the multiple dimensions countries need to address, often simultaneously, to facilitate the adoption and adaptation of new technologies, organizational processes and production practices associated with this revolution. Accordingly, the Digital Transformation Monitor (2017) documents the trend towards creating large multi-stakeholder platforms to foster policies for digitalization of manufacturing in developed countries.

Policymakers seek to explore and identify transformative solutions through different participatory approaches, foster shared visions of strategic goals, identify tested policy tools for scaling up, inform the design of policy incentives or uncover capability gaps that would justify dedicated policy interventions. Enhanced policy coordination mechanisms at different levels are necessary if commitment from multiple stakeholders is to materialize during policy implementation. Participatory governance is advocated to inform novel rationales and identify alternative models for policy action when addressing development challenges (Aiginger and Rodrik, 2020; Ferrannini et al., 2021), including resili-

ence against emerging disasters, which may have major implications on long-term industrialization and sustainability (UNIDO, 2021; Begovic et al., 2021). A multi-stakeholder approach is also key for transformative innovation to move society in the right direction to secure long-term benefits (Schot and Steinmueller, 2018).

While the adoption of multi-stakeholder participatory processes fosters interaction, dialogue and compromise building between academia, government, the private sector and other organizations that contribute to policy design, the processes can be mired in trade-offs associated with the organization and governance of such complex processes. For example, the actors involved need to ensure that decisions are binding and aligned with agreed roadmaps for policy implementation, with defined roles and responsibilities for all actors involved.

While collaborative approaches to policymaking can facilitate the convergence of industrial and other types of policies, successful collaboration is not necessarily guaranteed. The organizations involved differ in terms of institutional structures and practices, historical contexts, priorities, etc. For instance, the World Bank (2011) finds mixed results based on a review of over 20 years of private-public processes in the Mediterranean region, which is indicative of the complexity of this type of dialogues. The review concludes that success depends on the ensuing direction of the policy action, i.e. on where it leads in terms of industrial growth, for example. Participation in public-private dialogues may not suffice to guide decision-making, as the actions of participants might be influenced by those of other actors in the markets. Interest-driven decisions and lobbying by certain societal groups should be factored in in decision-making processes.

But what does ‘participatory process’ mean in practice? What are the benefits of participatory governance? How can such processes be organized? While structured social dialogue around industrial policymaking can address institutional dysfunctions, the risks of derailing policy-

making given the diversity and heterogeneity of the actors involved are just as great. Participatory processes can be meaningless and counterproductive, if conducted in an unstructured way. Without proper organization and mechanisms to take account of feedback may lead to “stakeholders’ fatigue”, when participants feel that their contribution does not change anything, that their voices are not being heard, or that their opinions and contributions serve other vested purposes. Similarly, the participatory process should draw on a wide variety of qualitative and quantitative data, which requires substantive computational efforts for their evaluation.

Thus, the conditions under which dialogue can be implemented and the circumstances under which successful participatory policymaking processes can be carried out must be clearly defined. It is moreover necessary to secure participation in the decision-making process, which leads to industrial policies that have greater social acceptance. Such policies hinge on the necessary legitimacy, buy-in and support for their implementation and trust in their outcomes.

This technical report aims to identify the conditions for effective multi-stakeholder participatory processes whereby all relevant actors are empowered to contribute to industrial policymaking to achieve optimal outcomes.

More specifically, this technical report:

- ▶ Discusses different approaches to organizing participatory policymaking processes, indicating the pros and cons that are associated with each approach;
- ▶ Identifies the types of institutional frameworks and the capabilities for policymaking, design and implementation required for such strategies to be effective;
- ▶ Illustrates how the selected approaches to participatory policymaking work, based on real case examples, including from developing countries;
- ▶ Provides recommendations on how to develop a policy tool to assist those interested in designing and implementing a participatory policymaking process.

The technical report discusses the application of multi-stakeholder participatory approaches to demonstrate how intensive or extensive such an exercise can be in practice, and documents some basic elements for organizing a participatory policymaking exercise, as well as some common pitfalls. Emphasis is placed on introducing key concepts and their practical application in distinct policy contexts. The potentials of participatory processes as well as the risks are explained.

The goal is to standardize knowledge and to facilitate systematic comparisons of cases and practises to support reproducibility and hypotheses testing, which allows for learning between approaches to occur. We propose a road map with recommendations drawn from the literature on how to successfully set up participatory processes, what factors to pay attention to and how to address conflict.

This technical report is structured as follows. Section 2 provides a brief theoretical overview of existing models of participatory governance or multi-stakeholder participation in policy processes. The discussion of the various possible approaches, including some that have recently emerged in the context of innovation policy, is non-exhaustive. Section 3 introduces some benefits that generally arise from participatory governance, including but not limited to learning and ‘cross-fertilization’ among participants in those processes. The discussion includes frequent caveats and possible ways to address these. Section 4 recommends four steps to be followed as part of the organization of participatory processes. Finally, Section 5 introduces some useful tools to facilitate the implementation of participatory policy making processes.

2. Models to foster citizen engagement in industrial policymaking and governance

The terms ‘participatory process’, ‘co-creation’ and ‘co-production’, which are frequently used interchangeably (Vargo and Lusch, 2004), are crucial for involving citizens in policymaking (Gebauer et al., 2010). The participation of citizens in policy development and decision-making is not a new concept. From Arnstein’s (1969) ladder of participation to Xavier et al.’s (2017) methodology of engagement, these works outline the hierarchy of various layers of engagement options of local community residents. Manzini’s (2015) map of participation entails a dual axis of collaborative and active involvement, which allows for the planning of participatory efforts. Manzini contributes to the existing methodology of participatory processes by focusing on the quality of interactions and the strength of social relationships formed as a result of participatory activities.

Several studies describe various phases of co-production with citizens and develop recommendations for active

citizen involvement in the planning and implementation of industrial projects (Brandsen and Pestoff, 2006; Verschuere et al., 2012). Many science and policy discussions focus on the use and organization of co-creation and participatory procedures. Some studies also address the many innate difficulties in defining the basic notions of democracy and the participatory processes that are part of it (Dahlberg, 2011). Finally, several studies include overviews of various ways to evaluate the impacts of participatory processes (Komendantova et al., 2018) and of various definitions, philosophies and methodologies for organizing participatory processes (Al-Jamal and Abu-Shanab, 2016).

The following section revisits various models of industrial policymaking and governance, including traditional, socio-environmental and systemic approaches and innovation models.

2.1. Traditional model

The traditional model was characteristic of the period during which the backbone of the existing industrial infrastructure in Europe and other countries was being constructed. At the time, this infrastructure was perceived as a driver of socio-economic development, and decisions were taken in a top-down manner—mainly at the national governance level—and were implemented at the local governance level. Citizens generally did not question decisions to build this infrastructure, because the assumption was that experts were the only legitimate actors who could produce and transfer knowledge. The relevance of this model has come under scrutiny in recent decades, especially when decisions had to be taken under conditions of uncertainty.

The traditional model is connected to top-down, mission-oriented policymaking to build capacity and guide in-

dustrialization. Mazzucato (2015) describes the pioneering role of the state in this process, guiding industrial firms’ investment efforts and business orientation towards high technology. The state helps address the risks and contain the costs associated with high technology; such investments are deemed uncertain, risky and costly. Under this model, the state makes decisions on the design and implementation of policies. This traditional model has existed for quite some time, yet new elements of bottom up and participatory governance have emerged, calling into question the pertinence of top-down approaches as the most suitable ones to inform policymaking.

Today, people’s attitude towards industrial projects is changing compared to the widely accepted model 60 to 70 years ago. This change is especially visible in Europe, where

people are emphasizing their right to participate in decision-making processes that impact their community, and about the need to implement industrial projects with the lowest possible impacts on the environment and on human health. The focus of the discussion is also changing, from contributions of industrial projects to national economic growth to contributions at the local level and the distribution of the risks, costs and benefits of these projects between the local and national level.

This change in perspective has been driven by a growing level of citizen awareness about their right to participate in decisions that have an impact on their lives in line with the Universal Declaration of Human Rights (Zillman, 2002), but also due to several industrial accidents that have occurred during the last century and various awareness raising activities about the need to protect the environment. These changes call for participatory processes to engage local community members, which goes beyond static notions of social acceptance. Such engagement is helpful in preventing public protests and is also a valuable input for project planning and implementation.

The notion of “public acceptance” was frequently used in previous years within the scope of the so-called “not-in-my-backyard” (NIMBY) discourse. The NIMBY discourse had a significant impact on how industry, legislators and the media perceived public participation and inputs from communities that host industrial infrastructure. The term “public acceptance” was coined to describe the attitude

of residents towards a project being planned or upgraded in their communities. Accordingly, the residents of these communities generally acknowledge the need for this new industrial project but are hesitant about accepting the development of new projects in their communities (Schweizer-Ries, 2010). NIMBY is also commonly considered a “social divide” between strong support for industrial policy goals, and opposition to the deployment of industrial capacities in local communities (Bell and Houry, 2016).

Many social scientists claim that the NIMBY rhetoric is a misleading, inappropriate and derogatory way of interpreting complaints. The so-called “decide-announce-defend” (DAD) approach, which industrial policy solutions were previously based on, involves collaboration between scientists and government authorities, with follow-ups and the dissemination of results of decision-making processes to the public. In this model, the absence of mechanisms to voice one’s own opinions and concerns leads to public outrage, a phenomenon known as “procedural justice” (Bell and Houry, 2016). As regards industrial projects, the DAD approach was found to be a frequent cause of societal tensions, project delays and even project cancellations (Wolsink, 2010). By contrast, a review of successful experiences of deployment of industrial infrastructure shows that including the perspectives of laypeople and public values helped improve the legitimacy of decisions on the deployment of such projects and increased trust among local communities in decision-making outcomes (Renn, 2008).

2.2. Socio-environmental model

This model was developed in the 1970s when multiple stakeholders with diverse, and often even conflicting views were invited to the table to co-design solutions for the management of natural resources, such as marine management (Newton and Elliott, 2016) or natural resources, livelihoods and agriculture (Bruggen et al., 2019). The benefit of this model is that it promotes compromise solutions among parties with diverging and conflicting views.

Various discourses on industrial policy perceive public participation and co-creation as a means to achieve public and societal approval. When the acceptance of residents is required to legitimize a project or to build infrastructure without public protest, the term “acceptance” is frequently

associated with tolerance of something that simply cannot be changed or is unavoidable (Batel et al., 2013). This perception applies a top-down normative perspective (Rau et al., 2012) and has frequently been criticized as it indicates a passive attitude towards something a stakeholder cannot change as opposed to a desire to utilize or pay for innovation, which implies a more active attitude of the stakeholder.

As regards social or public acceptance, Wüstenhagen et al. (2007) define “acceptance” as a multi-dimensional concept that encompasses attitudes towards technological and infrastructural advancements. There is a distinction between social acceptability and public acceptance; public acceptance applies to laypeople while social acceptability

applies to organized groupings of stakeholders. A group of organized stakeholders with strong knowledge and sectoral competence capable of participating in the decision-making process is referred to as ‘social acceptability’. ‘Public acceptability’, which has received far less research attention than ‘social acceptability’, relates to residents and laypeople who are either directly or indirectly affected by infrastructure developments. Only recently has research turned its focus on public acceptability, highlighting the importance of studying communities’ and individuals’ responses to certain projects (Batel et al., 2013).

Another reason why industrial policy should move beyond the notion of social acceptance and pursue participatory approaches is to take stock of societal attitudes, including support, resistance or opposition to various industrial projects (Batel et al., 2013). Understanding societal attitudes towards industrial policy more generally, towards organizations and companies that implement the projects as well as towards the industrial projects themselves can guide the implementation of the projects, ensuring a lower impact on the environment and human health, with greater benefits for both the communities and for the implementing companies while avoiding damages and preventing long-lasting protests and opposition (Komendantova et al., 2015). Such an understanding should rise above the need to provide stronger arguments in favour of the given project or for the use of different means of communication to increase its acceptance (Smith and McDonough, 2001). In fact, successful implementation of industrial projects re-

quires efforts to co-create strategies for their implementation while ensuring that those projects result in opportunities for local communities to live in a better place.

A lot of research has been conducted on public acceptability in relation to public resistance and how to overcome it. By contrast, attitudes towards infrastructure have received less attention (Cohen et al., 2014). Factors such as trust in the government or in the company implementing the project, the perceived need for the industrial project as well as its perceived and expected impacts strongly influence the opinions of local community residents towards various industrial projects. Because the lack of trust can lead to severe opposition to industrial projects, a participatory process might help increase the level of trust.

There is evidence that local community residents might oppose industrial projects because they disagree with the industrial company’s policy or because of how the project was planned and the decision-making process was conducted, rather than because they oppose the industrial project itself (Ek, 2005). Residents’ scepticism may also be viewed as a form of ‘place-protection’, resulting from a reaction to developments that threaten existing emotional ties and place-related identification processes (Devine-Wright, 2009). Local community residents are frequently concerned about the need for such industrial projects. They have reservations about the need for large-scale industrial infrastructure or investments (Wüstenhagen et al., 2007), or may scrutinize the purpose of the industrial project and question whether alternatives for this infrastructure exist.

2.3. Systemic approach and innovation model

This model has only emerged recently and covers horizontal industrial policy measures to stimulate innovation, new approaches to innovation and demand-driven innovation policies. It relates to innovations such as the green economy or digitalization. The model envisages active involvement of stakeholders and citizens in co-creating policy solutions and innovations. Examples include various forms of engagement in green economy or digitalization, such as energy groups participating in policy forums, citizen steering committees, various elements of innovation networks involving start-ups, accelerators, networks of knowledge dissemination, innovation incubators and laboratories, etc.

We describe co-creation here as an evolving concept within participatory design, with terms such as ‘co-design’ and ‘co-production’ frequently used to define it. Co-creation is a more precisely defined term and refers to the active participation of end-users in various phases of the manufacturing process (Prahalad and Ramaswamy, 2000; Vargo and Lusch, 2004). Co-creation is characterized by typical push and pull factors and implies that many parties collaborate to ‘create’ something rather than only one party producing something for the other to use (push approach) or only one party expressing a clear requirement or need to the other (pull approach). To reach a mutually agreed

solution, parties must be equal partners with comparable resources and speak the same language. This means that once innovation goals and any related concerns are defined at various governance and corporate levels, the research results must be translated into ideas that can be understood by those who can contribute to the solution by solving the identified problem(s), such as the private sector, creative communities and end-users.

In short, to overcome the push-pull dichotomy and achieve a thriving, competitive co-creation process with significant economic effects, governments, public administrations and research institutions must utilize entrepreneurial methods. The systemic approach and innovation model are a novel method for performing market research in both the private and public sectors. A major roadblock to open collaborative innovation is persuading researchers and government officials to speak the same language, to approach challenges from similar perspectives, and use comparable tools and resources.

Framed in terms of citizen involvement, Voorberg et al. (2015) distinguish between three types of approaches to co-creation in social and industrial innovation, in which citizens are co-implementers, co-designers and co-initiators.

Citizen participation in the (co)-initiation or co-design stage is referred to as co-creation. Co-production, on the other hand, is defined as people’s participation in the (co)-implementation of public services (Voorberg et al., 2015). Most research in this area according to Voorberg et al. (2015), focuses on citizens as co-implementers, with only few studies perceiving people as co-designers of innovation.

Many philosophers, scholars, and government officials are exploring the co-creation of values in industrial policy. However, they face the challenge of tangibly defining such a hazy, subjective and abstract term as ‘value’ (Bianchi and Labory, 2011). A range of perspectives exists around the notion of value as well as around the mechanism to capture and measure it (Warwick, 2013). The emerging reality evolves around interactions between the government, industrial firms and local community residents, which represent the foundation of co-creation. As a new frame of reference for value creation, Prahalad and Ramaswamy (2004) suggest that value can be co-produced. Value can also be co-created based on co-creation experiences. Furthermore, individual experience is a crucial input to the co-creation process of social or industrial innovation, which includes the value-creation process.

3. Benefits of participatory governance

Participatory governance offers the possibility to deal with complex and contested policy issues, such as industrial development projects that involve several stakeholders and organizations, without the possibility of identifying a single decision maker or a defined group of stakeholders, but rather a diverse set of people with different perspectives, abilities and mandates (Komendantova et al., 2018). Hence, participatory processes can facilitate the negotiation of compromise solutions involving a large variety of stakeholders with heterogeneous, difficult to reconcile views, interests, visions, plans, policy targets, etc. Many stakeholders can be included through complex interactive processes, enabling

policymakers to address a number of intractable challenges (Birkland, 2011). The industrial policy domain covers several stakeholders such as decision-makers, analysts, support employees, policy researchers and professionals from various academia, civil society, private and policy organizations. These stakeholders are also active at various levels of governance, from local to regional, national, continental and global levels.

According to Poppe et al. (2018), participatory processes have several advantages over non-participatory ones, such as integration of local knowledge and expertise, improved measures, decisions and mutual learning, which

are expected to result in higher levels of policy implementation. We describe these benefits in more detail below. However, it must also be borne in mind that experimentation is a key tenet of any participatory process, since it is difficult to determine at the outset how stakeholders would

3.1. Integration of local knowledge and expertise

Participatory processes allow for integration of scientific expert knowledge, with practical knowledge existing in local communities. Industrial infrastructure projects can be beneficial for local communities, but they also create challenges including land use conflicts and protests if they violate land rights and erode culture and the livelihoods of the local and indigenous communities (Ross, 2008). The socio-environmental impacts of industrial infrastructure projects can be substantial for indigenous populations. Involvement of the local population and their knowledge during the planning, implementation and monitoring phases of natural resource management can reduce socio-environmental impacts (Kearney et al., 2007).

However, tokenism is one of the most frequent forms of participation when feedback does not necessarily affect decision-making. ‘Tokenism’ means that the knowledge of and feedback from local communities is collected through various forms of stakeholder dialogue or data collection, though there is no guarantee that their inputs will feed into the decision-making process. The aim of tokenism is to inform decision-making processes but may sometimes also only be used to give an impression of an inclusive process, for example, when various minority groups are included in a decision-making process to give the impression of diversity, social inclusiveness and engagement (Oxford English Dictionary). Some academics take their criticism of token-

3.2. Improved actions and decisions

Through a participatory process, decision-makers, planners or community members can gain a better understanding of a system that is built on practical experience, which can therefore be readily translated into improved actions and decisions. Ideally, participation can improve societal learning of all stakeholders involved.

behave, or even whether all necessary stakeholders are both in place and willing to engage in collaborative policy-making processes. We therefore also describe various tools to facilitate the process and the different phases of process organization.

ism even further and describe it as a means to prevent an outcry (e.g. by including a minority group representative) and to make it appear that all groups are being treated equally (Jackson and Braboy, 1995).

Tokenism can lead to “stakeholder fatigue” when people stop believing in the benefits of participation. The practice of assessing the social impacts that can be derived from industrial projects is insufficiently addressed in several countries. It is crucial to assess the social impacts of industrial infrastructure projects in more detail and to pay more attention to cumulative impacts, which can be influenced by the size, scale and temporality of a project.

In many countries, the legal system to determine “major” impacts is quite loose and the roles and responsibilities of different stakeholders for socio-environmental impacts are not entirely clear. Frameworks for monitoring impacts need to be further developed, with unrestricted data available to anyone. Frameworks for equal and fair compensation schemes for local communities for the projects’ costs and risks should also be further developed. New guiding mechanisms are also required for long-term sustainable environmental development and the protection of culturally valuable socio-ecological systems because the current mechanisms cannot adequately capture these. Thus, various participatory procedures, such as socio-environmental impact assessments, need to be improved and standardized.

One example is the BestGrid approach which brought together transmission system operators (TSOs) and non-governmental organizations (NGOs) to discuss and understand the nature of stakeholders’ concerns about the deployment of electricity transmission grids in Germany, Belgium and the United Kingdom. The process of construct-

ing, extending and upgrading electricity grids in Europe is currently extremely slow, and stakeholders are questioning the need for infrastructure projects as well as the underlying assumptions determining this need. Failing to reach an agreement with local stakeholders on the deployment and sites of projects can cause lengthy and costly delays of the planning process and may even jeopardize the project altogether. Through the BestGrid process, the measures and decisions on the deployment of electricity transmission grids could be improved (Box 1).

The introduction of polycentric governance schemes represents another opportunity for improved actions and policy decisions. It is a system that comprises multiple centres of decision-making and co-production at different levels. In the polycentric governance system, stakeholders discuss the common good rather than a private or public one. It provides opportunities for the co-production of industrial policy by various stakeholder groups.

Energy policy is one of the areas where implementation of polycentric governance is currently being dis-

3.3. Mutual learning

Participatory processes seem useful for achieving sustainable and integrated industrial development when multiple actors are integrated into the policymaking process and can voice their opinions and recommend solutions on a platform with other stakeholders. In such contexts, participants are more likely to apply the understanding of the new system in the long term, beyond the temporal and planning

cussed. Emerging technologies and changing attitudes towards energy generation, transmission and distribution create various options that facilitate participation in energy transition. The emergence of distributed energy systems, which might lead to polycentricity in the governance of such a transition, also creates a need to reframe the discourse from social acceptance of certain technologies towards engagement, and from focusing on specific technologies to social innovation and new forms of governance.

Climate and energy model regions are an example of polycentric governance. This approach is not aimed at providing information and educating the public; it aims to listen to people and to provide them with a variety of options and alternatives to make informed choices about services that affect their communities (Box 2). Targeted information campaigns about possibilities of participation can significantly facilitate participation, but there is also a need to understand the role of emerging information channels such as social media.

targets of the initial participatory processes. Participation can facilitate system learning, thereby “implanting” a foundational understanding tailored to resolve similar long-term contested decision arenas.

A second way of understanding the benefits is through citizen inclusion and the use of participatory processes for involving local expertise and knowledge into contested

Box 1: BestGrid approach

The BestGrid approach provided an opportunity to involve a select group of targeted stakeholders in various pilot projects on the deployment of electricity transmission grids. The funds to enable national and local NGOs, such as Germanwatch and BirdLife, to be directly involved in designing the TSOs’ activities on

engagement and the environment were also provided. This gave the NGOs an opportunity to provide inputs on action plans and to provide guidance on how to address environmental protection and engagement concerns. The BestGrid approach goes beyond the level of tokenism, as it allows for a stronger and systematic collaboration

between TSOs and NGOs. This can be considered an innovative approach because the two groups are involved in the same project, their collaboration is voluntary, is based on the recognition of common interests and respect for each other’s priorities, and guided by an independent organization (Komendantova et al., 2015).

processes. One example is industrial policy planning or industrial infrastructure siting for conflict-free implementation of projects and for increasing the quality of life in hosting communities. Increasingly, collaborative industrial planning procedures delegate responsibility for the implementation of projects or for certain parts of decision-making processes to non-governmental stakeholders, such as the private sector, academia and civil society. In this case,

a participatory process can help identify compromise solutions between the various stakeholders involved but also increase the legitimacy, transparency and acceptability of the outcomes of the decision-making process.

The energy strategy process in Jordan is an example of how participatory governance and dialogue contributed to a better understanding among various stakeholder groups (Box 3).

Box 2: Improved decisions and measures in climate and energy model regions

Climate and energy model regions in Austria are committed to including a high degree of renewable energies (up to 100%) in their energy mix and set ambitious goals to achieve this. Some of these regions already had a system in place that allowed citizens to participate in decisions concerning the energy transition in their region. The research findings indicate an increase in the level of awareness about energy transitions and a willingness to pay up to 10% more for electricity from renewable energy sources when people have the option to

get involved in decisions on this issue (Komendantova et al., 2020). Interestingly, having the option to participate did not increase the number of people who participated in decision-making processes on the energy transition, but having that option increased the level of trust towards policymakers who implement energy transition. Most people who want to participate in decision-making processes also want to participate in the process of selecting the technology or the site for the renewable energy project, while participating in the financing

of projects is the least desirable objective. People who indicated that they were not interested in participating in decision-making processes stated that they did not have adequate information or time. The number of people who did not want to participate because they deemed that participation was not important was minimal. Overall, the research results confirm the willingness of people to participate in decision-making processes, but conditions for participation need to be created (Komendantova et al., 2020).

Box 3: Participatory governance to improve mutual learning and understanding

The Jordanian government is currently considering several electricity generation technologies to meet the growing demand for electricity and to diversify energy imports with locally available resources. The existing technological alternatives include the scaling up of renewable energy sources, such as solar and wind, deployment of nuclear energy and the exploration of shale oil. The views, perceptions and opinions about these technologies, however, vary significantly among the different social groups inside and

outside the country. There are also considerable differences in the perceptions of benefits, risks and costs of each electricity generation technology. The participatory dialogue conducted on the site of development of the energy strategy enable the involvement of various stakeholder groups, including local communities, youth, financing and project implementation stakeholders, policymakers at various levels of governance, academia and many others. Their involvement was facilitated through various methods

of decision-making experiments and focus group discussions conducted within the scope of the multi-criteria decision analysis framework. In the workshops, which representatives from all stakeholder groups participated in, their conflicting opinions were evident, especially for criteria such as safety, electricity system costs and pressure on local water resources. The workshops contributed to mutual learning and understanding of each position (Komendantova et al., 2018).

4. Organization of participatory process

There are several ways to design and manage a participatory process, but no clear principles exist to help stakeholders choose the most successful approach. Traditionally, experts and scientists were considered to be best positioned to make choices about development challenges (Perhac, 1996). Some scholars suggest that stakeholder involvement in complex decisions may be limited in terms of capacity and knowledge; for example, stakeholders' ability to understand the concepts of "uncertainty" and "variability" may be limited, hence scientists should take the lead in the decision-making process (Rowe and Frewer, 2000). The need to include a broader range of stakeholders is becoming more widely acknowledged, as expert knowledge might be limited or openly biased (KICS, 2011), especially when compared to local knowledge on the ground. Furthermore, experts sometimes disagree amongst each other (Jasanoff, 1997), and local knowledge may be crucial in resolving conflicts.

Based on the above, this section describes four basic steps to follow as part of the organization of a participatory process. These steps can be designed and implemented to increase the chances of capturing all potential benefits that can be linked to participatory processes and stakeholder engagement. The proposed steps primarily follow from socio-environmental and systems thinking, and from the innovation participatory models reviewed in Section 2. All of these steps allow for the integration of knowledge and expertise of various stakeholders, including local com-

munities. Opportunities for mutual learning are provided during all stages of the participatory process but especially during those where interaction among stakeholders serves to inform decision-making experiments, such as ranking of criteria and the development of compromise solutions (Komendantova et al., 2018) or decision-making experiments included in various games (Komendantova et al., 2021), focus groups discussions and other elements of stakeholder dialogue. A socio-environmental, systemic approach and innovation models can facilitate the organization of participatory processes. As discussed in Section 6, digital tools can be applied throughout the entire process to facilitate stakeholder engagement and thus turn into an element of engagement themselves.

If properly designed, participatory processes offer the potential to identify and develop compromise solutions for conflicting opinions about various policy targets, sectors or stakeholders' positions. Moreover, the implementation of various steps of the participatory process can lead to improved decisions and measures. The participatory process could also become an element of an enhanced decision-making process and improve the implementation of decision-making outcomes. In addition, participatory processes can help identify truly innovative solutions by transforming a given situation. This can bring benefits for all stakeholders over the long term. Figure 1 illustrates the four steps of the participatory process.

4.1. Preparing the process

The first step in the co-creation procedure is to develop a detailed mapping of stakeholders who are of relevance for industrial policymaking. Stakeholder mapping is a tool used in research on participatory governance, which allows identification of the most relevant stakeholders to be invited for participatory processes. But it is also the most essential element for initiating the engagement process as such.

Depending on the method(s) used to conduct the mapping, the latter can also be the engagement element, for example, when consultation with an initial set of stakeholders leads to the identification of additional relevant stakeholders in what can be characterized as a snowballing process.

The term "stakeholder" and the notion of "having a stake" were originally used to designate investors who had

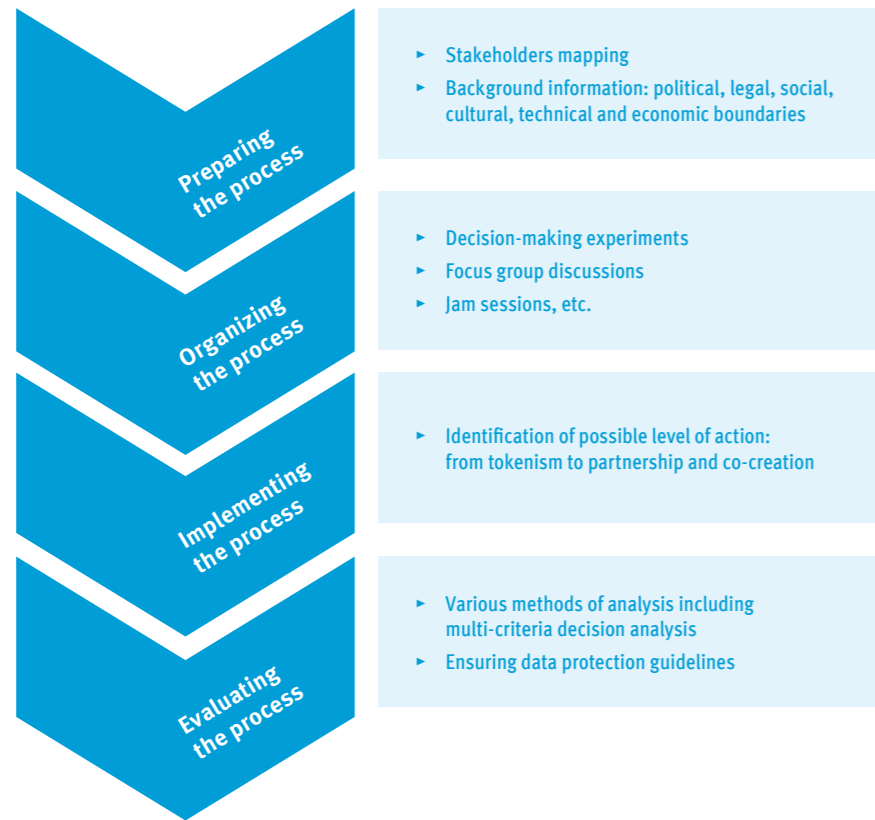


Figure 1: Four steps of the participatory process

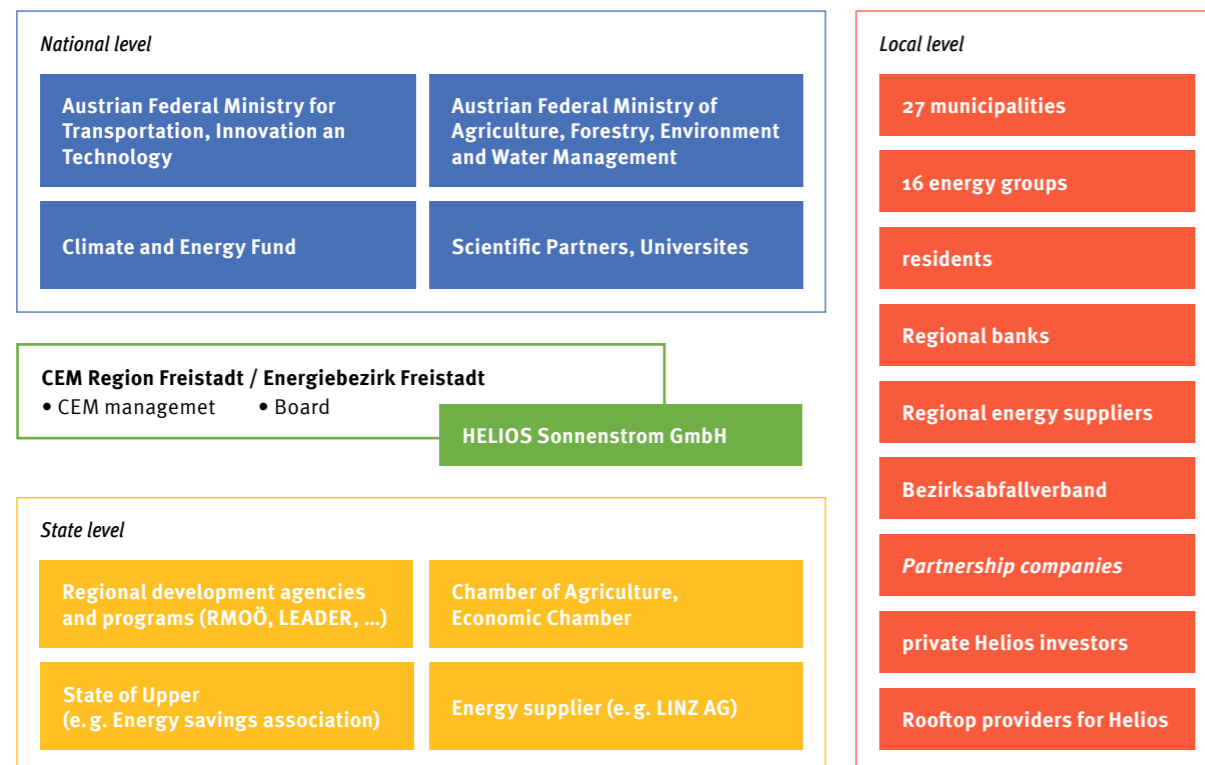


Figure 2: Stakeholder mapping for CEM process in Freistadt

Source: Komendantova et al., 2018

a financial stake in a company. In the context of a private firm, stakeholders are those whose support the firm would not be able to survive without. The term has evolved over time to encompass individuals involved in or who are impacted by the firm's course of action, and who therefore have several 'stakes' – personal, emotional or in the form of shared resources. Stakeholders are often defined as all individuals or groups who can influence or who are affected by an organization's activities, objectives or policies. This concept acknowledges a person's subjective viewpoint on a given issue. Stakeholders are self-selecting in certain ways: individuals who consider themselves to be stakeholders are also stakeholders.

Given the complexity of the process of determining which stakeholders to include in the design of a participatory process and the conditions under which they are to participate is both a theoretical and a practical issue. Various stakeholders are entitled to different considerations since their influence is not equally strong. Stakeholders may be legally required or entitled to participate in specific cases. In other circumstances, a participatory process is necessary as a response to disputes and as a means for creating legitimacy, justice, fairness and equity.

Stakeholders should be mapped according to issue, region, role in and scope of engagement and any other relevant factors. There are a number of useful holistic frameworks to identify and categorize different types of stakeholders as part of stakeholder mapping exercises. Stakeholders can be categorized by various groups such as policymakers, business, academia, civil society, financing, etc. These groups are identified in accordance with the given project, product or activity to be implemented.

According to Eden and Ackermann (1998), such mapping can include persons or various groups of persons with the power to respond, negotiate and alter the strategic future. This, however, is a restrictive definition because it only includes those who have power to influence but not those who are affected or do not have the power to respond and to negotiate (Bryson, 2004). Stakeholder mapping based on a broader identification can therefore include groups or individuals who can influence and who are affected by the implementation of the planned activity, project or infrastructure (Freeman et al., 2018).

Stakeholder mapping can also identify experts and stakeholders from various scientific disciplines, policy ar-

eas, civil society and academia who can contribute during various phases of the innovation process and policy development, starting from the generation of innovative ideas, the identification of needs and priorities for action and the details of implementation. Thus, stakeholder mapping and its related participatory process can contribute to output legitimacy, namely how needs were identified and how the project's risks, benefits and costs were distributed, as well as procedural legitimacy, namely how different voices were included, which stakeholders participated and how their needs were expressed.

The criteria for stakeholder identification may differ, e.g. by degree of influence or impact or how they will be affected. The mapping exercise can include various categories of stakeholders depending on project or activity, such as users or beneficiaries, various governance stakeholders such as steering groups, board members, etc., various influencers such as trade unions, media, YouTubers, etc., providers, suppliers or partners. As an illustration of the heterogeneity of potential stakeholders, Figure 2 presents the results of stakeholder mapping for the implementation of the climate and energy model process in the Austrian region Freistadt.

Some of the stakeholders can be invited to represent the core stakeholder group, which will in turn consist of community members and expert advisors. Others will be part of the enabling environment, allies and umbrella movements, with a separate category for media. Finally, stakeholders can be mapped from the market segment, namely those that will assist with the uptake of social or industrial innovation. They will bring in representatives from technical groups as well as shareholders, potential buyers and customers.

Compiling a list of stakeholders is not the ultimate goal however. Rather, a stakeholder analysis aims to provide a decision-making tool that is suitable in terms of the demands of individual managers and decision makers. Understanding the political and sociological variables that may affect a project, programme or organization allows for proper and successful selection and prioritization of management and communication strategies tailored to specific target audiences. Searching for individuals involved in similar activities may help reduce duplication and errors, while offering prospective collaborations and alliances when suitable.

Stakeholder mapping helps identify the political and social boundaries of the follow-up participatory process. Stakeholder mapping can be conducted around the following categories:

Political and legal boundaries:

What is the political structure in the project region, i. e. how many levels of government are there and how do the different levels of government influence the topic at issue? What characteristics, motivations and conflicts describe the local political culture? What level of engagement and co-creation does the system allow for? Which laws and other rules and regulations apply to the topic at issue and which legal framework establishes public involvement rights and limits?

Social and cultural boundaries:

Which factors influence the local population's identity in terms of social and cultural boundaries? Are there large ethnic or tribal groupings, various languages or religious, social or cultural factions in the population? Is local culture self-contained or are other cities or nations used as role models and trendsetters?

4.2. Organizing the process

Once the stakeholders have been identified, the organization of the participatory process can begin. The first step is to develop comprehensive and clear and coherent materials about the planned activity, infrastructure, or project. Information about the planned activity and nature of the participatory process can be provided through various channels such as flyers, information sent by post, press releases, banners, films, websites, newsletters, text messages and infoboxes.

Stakeholders can be approached using various contact channels and means of communication. Providing them with materials will facilitate their decision to either participate in the activity or not. Furthermore, the rules governing the participatory process should be developed at this stage

Technical boundaries:

Does the technical infrastructure have any special characteristics, does access to or usage of technology need to be addressed in the project design? Are there any social media networks or prominent local online groups that are particularly popular in the relevant area?

Economic boundaries:

How is economic power distributed in the project region, and what is the structure of the local economy? Are there any large employers, dense industrial clusters, ports or special economic zones within or outside the project region?

While developing the stakeholder mapping exercise, the social and cultural background within which the project, activity or infrastructure will be implemented must also be understood. This background can influence stakeholders' behaviour. Understanding cultural background can help address certain problems by recognizing the many cultures among the diverse range of stakeholders. Through stakeholders mapping, the challenges of the co-creation process as well as its societal context can be better understood; its public context, such as the executive, legislative, judicial, educational and civil society context (rules and processes); as well as the existing routines of interaction between stakeholders.

and communicated to potential participants. These rules may include, for example, anonymity of participants – the so-called Chatham house rules, or how their names and organizations will be acknowledged. They can also include rules in line with various existing guidelines on stakeholder participation such as General Data Protection Regulations and others.

All data collected from persons are subject to (explicit) informed consent and the permission of those who participate in the consultation. An information letter and a consent form should be included for potential participants.

In case the Chatham house rules are selected, the following rules should be considered and communicated to participants and to anyone involved in the organization of

the participatory process to ensure that no harm is caused or that no sensitive information is disclosed and that the data will be handled, stored and shared safely:

- ▶ Participants must be informed of their right to withdraw, amend or remove their responses at any time during the participatory process.
- ▶ All personal data should be anonymized as quickly as possible, with all identifying information disguised (that is, deleted) so that it can no longer be defined as personal. Personal information that is no longer needed should be removed as soon as feasible.
- ▶ If data cannot be rendered anonymous, it should be pseudonymized as far as feasible.
- ▶ Only members of the team leading the consultation should have access to sensitive personal data, which should be encrypted or password secured and housed in a dedicated secure cloud.
- ▶ Only secure channels shall be used to send, exchange or handle data.
- ▶ Personal data obtained in a tangible form (e. g. on paper) must be kept in a limited access location (e. g. a locked drawer) and shall be accessible to designated persons only. The physical copies of data should be deleted once the material has been digitized.
- ▶ Continuous monitoring should be provided to ensure that data is treated ethically in accordance with legal requirements and applicable data protection principles.

Next, the format of participation should be determined. The format of participation can include:

1. Exchange of information, including personal discussions for which participants receive all information and can provide feedback. This can include consultations at exhibitions and fairs, at breakfasts in public spaces, roadshows and festivals, excursions through the region with planned activities, feedback boxes, etc.;
2. Moderated discussions at thematic roundtables with the goal of bringing together stakeholders from various groups, such as citizen panels, ideas competitions, citizen councils, citizen and world cafes, dragon dreaming, placemat methods, dynamic facilitation, values exchange, charette, citizen forums, 21st century town meetings, forum theatres and mediation;
3. Qualitative surveys with open questions to collect knowledge on the ground as well as risk perceptions connected with the planned project and other scientific methods to collect information such as simulations, representative surveys and samplings, interviews, focus groups and speed dating, planning workshops, future laboratories, working groups, Community councils, etc.;
4. Online consultations where people can provide feedback. These can take various formats such as consultations through social media, online diaries and blackboards, virtual 3D excursions, moderated online forums, online video information and interactive online maps, online idea platforms and open spaces, online and extranet dialogues, etc.

4.3. Implementing a participatory process

There are different levels of interaction between citizens and stakeholders. These levels include non-participation, tokenism and citizen power (Figure 3).

The “non-participation” level at the bottom of the ladder combines two very different elements: manipulation and treatment. Manipulation refers to a situation where strong actors use less powerful and/or disadvantaged demographic groups to achieve their aims. Conversely, the treatment component is used to resolve an issue or educate the parties involved. This is a “Decide-Argument-Defend” methodology to gain public support for a planned

infrastructure development plan, mostly through public relations.

Informing, consultation and placation are all part of the second level of “tokenism”. One of the stages required to legitimize the procedure is to inform. This level, however, only provides for a one-way flow of information, with no means for participants to provide comments. The public is not allowed to participate since there is no way for them to influence the decision-making process. Only choices that have already been taken are communicated to the public. Unlike in “Therapy”, the goal here is to disclose information

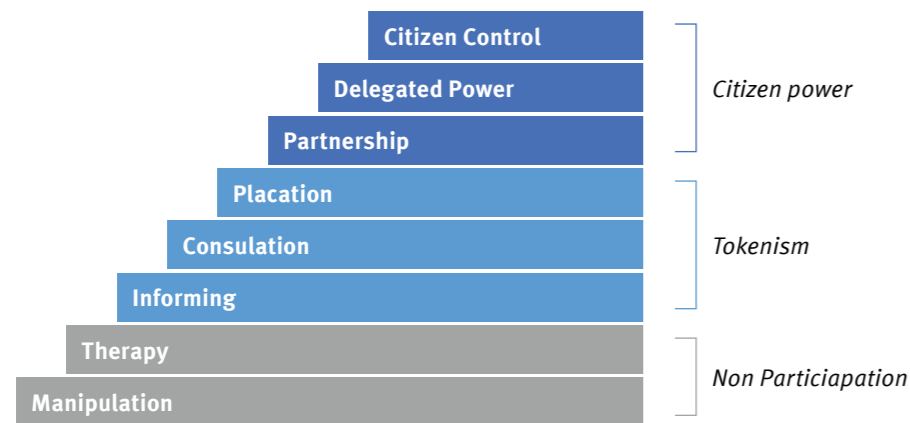


Figure 3: Ladder of participation

Source: Arnstein, 1969

and ensure that the project and decision-making processes are transparent.

At the same time, “Consultation” refers to the ability of members of the public to participate in decision-making processes. They are questioned about their concerns, which should be considered by the project developers. Each input should also get a response which explains how it influenced the final choice. A variety of mechanisms for gathering stakeholder concerns is provided in this phase, including data collection via surveys, community meetings and public inquiries.

The next level is “Placation”, during which interaction—primarily with representatives of stakeholder groups—is established, for example, through the creation of advisory positions. Project developers thereby maintain the ability to assess the credibility and viability of the inputs and feed-

back. Stakeholders are invited to engage in the process before any decisions are taken, and they are given several opportunities to influence the decision-making process at this stage.

Partnership, delegated power and citizen control are part of the third level, which focuses on citizen power. Citizens and power holders share planning and decision-making duties in partnerships, and power is redistributed via negotiation. Through joint committees, for example, the have-nots, impoverished or vulnerable persons can negotiate and engage in trade-offs with power holders. Citizen control takes place when citizens oversee the full planning, policymaking and project management process without the involvement of any external parties. At this level, citizens also have the majority in decision-making seats in committees or complete management control.

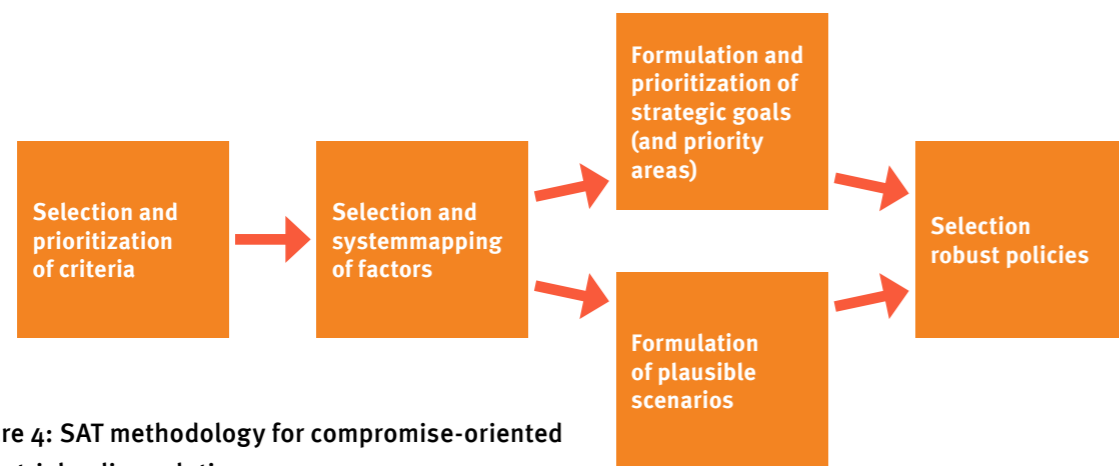


Figure 4: SAT methodology for compromise-oriented industrial policy solutions

Source: Rovenskaya, 2018

4.4. Evaluating the results

Various methods of analysis and models of systems thinking can be applied, for example, cooperation models, decision support systems and participatory modelling.

- ▶ Cooperation models are game-theoretical models for public goods and common pool management with real world complexities. They can include such factors of analysis as bounded rationality, social heterogeneity, cultural dispositions and institutional incentives. Examples of cooperation models and games include games developed within the scope of the BestGrid project which took account of the positions of various stakeholders and negotiations were held to arrive at compromise solutions for the deployment of electricity grids in terms of optimal location, environmental impact and visibility as well as socio-economic impacts from investments in electricity transmission and distribution grids.
- ▶ Decision support systems are problem structuring methods that include prioritization of criteria, connections of drivers and criteria elicitation, selection of background influences, formulation of strategic goals and selection of the most important drivers. Examples include various decision support models such as models calculating levelized costs of electricity under various parameters which allow for stakeholder involvement based on inputs in interactive formats. The changes in results allow for further discussion and negotiations on the input parameters.
- ▶ Participatory modelling can include multi-criteria optimization and prioritization as well as systems mapping, morphological analysis and participatory scenario planning. Examples include identification of short-, medium- and long-term priorities within the scope of the industrial development strategy of Kyrgyzstan where participatory modelling involved stakeholders from various ministries as well as from four regions in Kyrgyzstan, which allowed identification of priorities in terms of socio-economic development, environmental protection, regional development and others (UNIDO, 2018)

Which methods to select depends on the goals of the participatory process. Identifying the relevant method can

take place during the preparatory phase of the participatory process.

The systems analysis tools (SAT) methodology developed by the International Institute of Applied Systems Analysis (IIASA) is an example of a methodology for analysing the results of participatory processes (Figure 4).

The SAT methodology helps structure the problem, identify priorities and arrive at compromise solutions between these priorities and the views of various stakeholders. The methodology comprises several steps.

- ▶ **Step 1:** defining the selection and prioritization of criteria based on the implementation of a multi-criteria decision analysis. This step helps to elicit and prioritize multiple stakeholder preferences over competing goals. In practice, it means understanding which criteria matter for various stakeholder groups. One example is the participatory development of the strategy for energy sector in Jordan. The first step entailed developing criteria that mapped the relevant issues for the energy sector’s further development, such as costs, technology transfer, environmental impacts, safety and others. In a game process, participants identified various stakeholders’ preferences as regards these criteria and which ones were the most important. For example, for local NGOs, water was the most important criteria. For decision-makers, energy costs and safety were deemed to be the most important criteria. In a compromise exercise through negotiation processes, the participants identified the trade-offs of various criteria, especially where the difference in opinions was extensive, in order to identify priorities for the development of the energy sector. For instance, strong preference for one criteria implied that a certain technology was preferred over other alternatives. Discussing these criteria among stakeholders also had high awareness raising value for the stakeholders themselves about the positions of various other actors, such as national versus local decision makers, for example.
- ▶ **Step 2:** systems mapping, which helps create representation of the considered system, articulating its boundaries, components and the links between

them. For example, systems mapping uncovered the most important factors and drivers of a national water nexus system, helping to identify the objectives of the Water Strategy as well as the main uncertainties affecting the water nexus system (IIASA/OECD, 2020).

- ▶ **Step 3:** the morphological analysis can be used to determine uncertainty factors and their possible manifestations. It enables exploring possible alternatives for uncertainties.
- ▶ **Step 4:** scenario planning helps outline plausible future scenarios of the system's development. Within the scope of the water-energy nexus discussion, it enabled narratives to emerge, outlining plausible future scenarios of the water nexus system on a specified time horizon
- ▶ **Step 5:** involves robust decision-making which helps create a portfolio of actions to achieve the preferred goals under all scenarios. For example, it can be used to correct a portfolio of policies and actions that are suitable across plausible scenarios and to prioritize them according to their contribution to achieving strategic objectives.

This methodology was applied to several policy processes including the preparation of the Strategy of Sustainable Industrial Development of Kyrgyzstan developed in cooperation with UNIDO (Box 4), or the guideline documents for strategic planning of water resources and water infrastructure under high uncertainties and conflicting interests developed in cooperation with the OECD (Box 5).

The participatory methodology was also applied to the strategic planning of water resources and water infrastructure under high uncertainty and conflicting interests. In the planning of water resources, the law requires stakeholder engagement and public participation in water strategy planning processes. IIASA, in partnership with the OECD, developed and made available a gamified participatory approach to strategic planning for potential users, aimed at devising robust water strategies by eliciting collective wisdom from relevant experts and stakeholders.

Box 4: Strategy of Sustainable Industrial Development of Kyrgyzstan

Kyrgyzstan is currently at the crossroads for further development and revitalization of its industrial sector. Several options are available to achieve this goal and to identify priorities. Industrial policy is a contested policy issue, as a variety of factors as well as heterogeneous opinions must be considered. Consequently, plausible scenarios of Kyrgyzstan's industrial development until 2040 were developed (Strelkovskii et al., 2020). The scenarios were used as a basis for the Strategy of Sustainable Industrial Development

of Kyrgyzstan which was officially adopted by the Government of Kyrgyzstan in September 2019. Based on a participatory process and the implementation of SAT methodology, the following priorities were developed for Kyrgyzstan, such as the improvement of the quality of governance, securing access to financing and boosting investment, enhancement of regional and global economic integration and export opportunities, the integration of regional development with industrial development,

addressing social development goals and environmental sustainability, creating the necessary infrastructure, fostering the development of key strategic sectors such as electricity, light industry, machinery, construction and information technologies. Following the participatory modelling approach for each of the identified priorities, the short-, medium- and long-term goals were determined as well as the monitoring indicators and risk factors (UNIDO, 2018).

Box 5: Participatory modelling of water resources and infrastructure

The participatory modelling and SAT methodology helped the European Union Water Initiative Plus for the Eastern Partnership, which includes Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine, to reach its commitment with a focus on the management of transboundary river basins with support of the development and implementation of pilot river basin management plans through local

stakeholder participation. The participatory planning process based on the SAT methodology helped participants internalize a systemic nature of the problem of strategic planning of water resources and water infrastructure; to recognize the plurality of stakeholders and reconcile the diversion of their perceptions and objectives; to assess and explicate a broad spectrum of uncertainties

and risks involved; to realize the multiplicity of future development options which lead to multiple scenarios; to understand that the effectiveness of various solutions differs across multiple objectives in different scenarios and that for defining a successful strategy, robust solutions and a multi-criteria analysis are necessary (Strelkovskii et al., 2019).

5. Tools

Different tools can be used to facilitate stakeholder participation; this section presents a few examples and their application in real life experiences.

5.1. Participatory governance evaluation toolkit

It is crucial to analyse the participatory process itself to understand its consequences. Typically, such a procedure has several qualities that may have an impact on its efficacy (Smith and McDonough, 2001). Because most of the factors described in the literature are procedural rather than substantive (Middendorf and Busch, 1997), evaluating the effectiveness of the entire process rather than of specific metrics is simpler. We provide an example of a toolkit which allows an evaluation of the participatory process according to four principles, as described below. These principles are (i) engagement, (ii) transparency, (iii) benefit and (iv) environment.

The notion of **“engagement”** refers to the importance of involving civil society, particularly local communities, and

other interested parties. Engagement is a two-way communication process that includes not only the dissemination of information but also the gathering of opinions, attitudes and concerns about a specific industrial project and its impact on the local community. It not only entails ongoing information sharing between the public and project developers, but also conversations and negotiations between all stakeholders that reach beyond basic consultation, which is also a two-way communication process. It might change people's minds and has an impact on decision-making (Rowe and Frewer, 2005). According to available evidence, the engagement process should begin as soon as possible (Rottmann, 2014). The best moment to involve stakeholders is still unknown, however, because the notion of “as

soon as possible” might result in a process that begins “too soon” to be relevant to stakeholders, while delaying the process can lead to stakeholders feeling that they were consulted “too late”. The “participatory dilemma”, as defined by Hänlein (2015), is the danger of missing the optimal time for interaction.

The idea behind “*transparency*” is that information about the project and decision-making should be transparent at all stages of the process, and stakeholders should have the ability to influence outcomes. Transparent participatory procedures should be based on negotiations and inputs from local stakeholders, and should include opinions and concerns about potential alternatives, technology, impacts, costs, compensation and benefit-sharing arrangements.

The “*environment*” principle addresses impacts that can be associated with an activity, project or infrastructure. They specifically refer to the environmental implications for local communities in terms of the quality of soil, air, water, biodiversity or any other resources. Following this principle, existing legislation on environmental protection can be evaluated and how it is implemented in practice, how the

activity adheres to this regulation and what the potential risks and impacts are. Local stakeholders’ concerns about prospective consequences on human health and human settlements should also be considered during the strategic environmental planning phase.

The concept “*benefit*” explores the possibility of delivering advantages or compensation to local communities, as well as producing additional co-benefits (Schneider and Sander, 2012).

Varying involvement aims and objectives, lack of communication, misinterpretations, and the lack of information among the parties involved, as well as perceptions of the severity of the consequences can lead to misconceptions and complicate the design of industrial infrastructure projects. More information and understanding about the heterogeneous perceptions of benefits and challenges of land use change, as well as degrees of participation in environmental management is necessary to understand what triggers land use conflicts, conflicts in participatory processes, and how synergies in environmental management outcomes can be achieved through public participation.

5.2. Environmental and social impact assessment

The participation of local communities can be organized through various formats such as environmental impact assessments (EIA) or social impact assessments (SIA), which enables communities to provide feedback on environmental, social and economic challenges that can be linked to industrial development projects. The EIA is not a decision-making procedure, but an evaluating and planning procedure that can inform policies (Koivurova et al., 2016). This is particularly important because local communities, including rural and indigenous communities, often bear the risks and costs of industrial projects in terms of the environmental and societal impacts. **Box 6** shows how the knowledge of indigenous and rural communities can be integrated in the decision-making processes through EIA.

The SIA is a policy tool that analyses a project’s socio-cultural effects based on inputs provided by socio-political actors about its societal viability; it also delivers management recommendations to address any adverse societal effects the policy may have, with an emphasis on expanding its positive effects (Esteves et al., 2012). The

Box 6: Participation of reindeer herders in the EIA procedures in mine and wind farms in Finland

One of the main aims of the EIA in Finland is to encourage the participation of different parties in the planning phase before project implementation takes place. The research among reindeer husbandry communities showed that an EIA could be used much more efficiently as a negotiation and information sharing “laboratory” if representatives of traditional livelihoods, such as herders, were considered to be experts (Landauer and Komendantova, 2018).

SIA is internationally defined as a study that seeks to understand the changes a project or policy can generate in the social sphere and its potential negative and positive impacts, including social (life forms, work, recreation, relations between people and organizations) and cultural aspects (values, beliefs and norms that influence the way people perceive themselves and their community) (Vanclay, 2002). The SIA is conducted to provide information to

government actors, firms, social actors and communities about a project’s sociocultural effects in a specific context, with the objective of preventing and mitigating adverse impacts and maximizing positive ones, as well as improving the management of relationships between the project and the community (Esteves et al., 2012; 2002; Burdge, 2003). **Box 7** presents the example of a SIA in renewable energy projects in Mexico.

Box 7: Involvement of stakeholders in a social impact assessment of renewable energy projects in Mexico

While studying social opposition to renewable energy projects in Mexico, Martinez and Komendantova (2020) found that the introduction of a SIA had a positive impact such as the establishment of institutional channels in various spheres of industrial policy, growing awareness about the relevance of social management, and the integration of the social agenda by some companies. Before the

SIA, the renewable energy sector in Mexico had no social impact management. The introduction of a SIA has thus resulted in some positive changes, such as the establishment of institutional channels for the social agenda, growing awareness about its relevance, and the internalization of social management practices by some companies. Several aspects of the design and practice of SIA

limit its effectiveness, however. The quality of SIAs is limited by gaps in the regulation in crucial areas such as the definition of social impacts, social involvement and shared social benefits. The reliability and social legitimacy of SIA evaluations are limited by the low specificity of evaluation procedures, the lack of social involvement and the limited institutional capacity for SIA implementation.

5.3. Digital tools as enablers of participation

Digital tools are important enablers of participation and improved governance. Digital and social media have made it easier to identify issues across any scale, from localized neighbourhood to global planetary concerns. Advances in information and communication technologies, particularly the rapid emergence of social media, are quickly becoming vehicles with a powerful influence on how policymakers and the public interact during the policy-making process. Interactions between policymakers and citizens are being shaped by developments in the field of open government data, sophisticated analytics, visualizations, simulations and gaming, as well as by ubiquitous citizen access via mobile and tailored apps. Artefacts, processes, interfaces and people come together in platformed interactions in purpose-built system settings, which are increasingly enabled by digitized technology platforms according to Ramaswamy (2009). The notion of such an interactive platform is critical

to our understanding of how resourced capabilities build values, decision or inputs through co-creational interactions. According to Prahalad and Ramaswamy (2004), individuals co-construct their own contextualized outcomes of value through interactions with a network of entities.

New technologies and emerging digital tools follow this tendency and allow the implementation of participatory processes in innovative ways. Digitally enabled participatory processes and co-production can improve process efficiency, speed up response times, make them safer by decreasing human error, and increase inclusiveness, democracy and participation by giving different actors the same possibilities. The E-Participation Index developed by the United Nations Department of Economic and Social Affairs (UNDESA) allows to measure how digital media facilitate participation (**Box 8**).

While the ability to identify and express issues is made more accessible, there is, however, an ever pressing need to create mechanisms to connect those affected by an issue to appropriate means of taking action to address that issue. The potential of digital media can be considered when combined with other conditions such as an adequate regulatory framework, skills and awareness as well as available digital infrastructure to avoid risks of digital divide related to access to digital infrastructure (Porwol et al., 2018).

In the face of the current technological revolution, driven by the implementation of digital technologies and Industry 4.0, many policymakers are realizing the potential of new technologies for participatory processes and co-creation. The best practices of a policy on digitalization and digital media as enablers of participation are found in EU strategic documents (Box 9).

Additional examples of how digital media facilitate participation can be identified in various countries. For example, Portugal is implementing a participatory budget (Box 10).

Digital media often have the potential of contributing to good governance and open data. Currently, several tools exist, such as the Open Data Charter or the Global Data Barometer (Box 11).

Box 9: EU policy on digitalization

The digital strategy of the European Union builds on three key pillars, namely digital enablement and protection for individuals, including a regulatory framework for artificial intelligence and the availability of broadband, as well as fair competition and sustainability. It also includes an industrial strategy package and revised rules to deepen the internal market for digital services. The primary aim of the digital strategy is to ensure governance of the internet as an open, free and inclusive platform, and to develop a sustainable approach to internet governance through multi-stakeholder participation.

Box 8: E-Participation Index

The E-Participation Index was developed to measure the use of online services to facilitate the provision of information by governments to citizens (“e-information sharing”), interaction with stakeholders (“e-consultation”), and engagement in decision-making processes (“e-decision making”). The index is based on the participatory framework of three pillars (Islam, 2008):

- Information: how access to reliable, clear and comprehensive information supports citizen participation;
- Consultation: how to facilitate the engagement of citizens in the deliberation of public services and policies;
- Decision-making: how to empower citizens through the co-design of policy options, co-production of service components and delivery modalities.

Box 10: Participatory budget of Portugal

Portugal is the first country in the world to implement a participatory budget. Digital media provide citizens of Portugal the opportunity to propose and vote on various ideas for public investment funded by the National State Budget of Portugal. Through digital media, citizens can cast their vote on the final set of proposals. In 2017, over 1,000 proposals were submitted through the system and from these, 599 projects were presented for voting. A total of 38 of these projects received financing. Altogether, 78,000 people participated in the procedure.

Box 11: Open data tools

The Open Data Charter is a set of best practices for publishing and using data. It integrates three principles, namely the availability of data to all, the right to privacy and data protection for security reasons. The Global Data Barometer integrates principles of a trustworthy public data ecosystem, the effectiveness of the legal framework for data protection and release, and the capacities of various stakeholders to collect, manage, share and use data.

Box 12: DecideIT

DecideIT facilitates automated preference elicitation processes, leads to the creation of result robustness metrics, and contains algorithms for co-evaluating quantitative and qualitative data in multiple forms. The ability to adequately represent and evaluate second-order information allows for decision-making based on incomplete input data using second-order distributions of views on basic utilities, probabilities and criteria weights, which then allows for a better and more transparent definition of values for various decision alternatives (Ekenberg et al., 2021).

To be effective, a participatory process must be formalized. Participatory modelling is a procedure that allows for consideration of facts as well as values by asking questions and gathering input from stakeholders as part of a co-creation approach. It necessitates active citizen involvement and two-way communication, with feedback being collected, analysed and applied (Funtowicz and Ravetz, 1994). Moreover, such engagement contributes to better knowledge of the many perspectives, criteria, preferences and trade-offs of stakeholders but also of citizens, which are important

for the decision-making processes in industrial policy or for the implementation of industrial projects (Antunes et al., 2006). Ekenberg et al. (2021) developed an overview of a significant number of modelling efforts to formalize the participatory process. In this Technical Report, we present the necessary tools for the organization of the participatory process which can be applied during the data collection, elicitation and evaluation phases. There are different examples of tools, such as DecideIT (Box 12).

5.4. Testbeds as enablers of co-creation

Testbeds are ideal environments for co-creation processes to emerge. A test-bed’s goal is to establish a shared environment in which digital services, processes and new ways of working may be developed and tested with real-world user representatives. As a result, a testbed is an environment in which people and technology are brought together, and where the everyday setting inspires and challenges both research and development, as authorities and citizens actively participate in the innovation process. It is a testing ground for new development initiatives, allowing for rigorous, transparent and repeatable testing of scientific ideas, computational tools and new technologies. As a result, a test bed actively contributes to encouraging more innova-

tion in the public sector, industry and academic research. It is a collection of public-private partnerships in which researchers, technology experts, businesses, governments and people collaborate to develop, validate and test new services, business concepts, markets and technology in real-world settings.

Innovation testbeds can integrate innovation lifecycles, from planning to delivery to market implementation. Various stakeholders including public administrations, citizens (domain experts/contributors), civil society, the applied research community, and civic techs can be involved in the co-creation of various innovations.

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