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# Discovery-oriented innovation and industrial policies: insights from five regions about open discovery processes

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# Abstract

This study reveals that five regions in Europe are embracing a new form of "discovery-oriented" industrial and innovation policy thinking and planning, characterized by open discovery processes that involve extended collaboration between regional authorities and external stakeholders. The study identifies two distinct types of "discovery" in the context of industrial and innovation policy-domain. First, "problem-discovery" involves the process of moving from global directives to regional-specific agendas, resulting in the definition of transformational goals that serve as an intermediary layer for concrete action roadmaps. Second, "system-discovery" focuses on understanding and sensing the system, identifying key actors and existing efforts in the territory aligned with the defined agenda. These processes also involve identifying barriers to change, with the creation of platforms that enable diverse stakeholders to collaborate, define shared goals, and develop actions with transformative potential. The regions are driven by the need to adapt and improve previous practices, but also to break the traditional approaches. However, the implementation of these new approaches remains an emerging experimental practice, very much dependent on the capacities of the owners of the processes.

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## **Executive summary**

The European Union and its regions are rethinking its industrial and innovation policy in response to the challenges of global climate change, health crises and geopolitical shifts. The new approach emphasizes resilience, autonomy, and sustainability. To support innovation and policy-making, a broader innovation policy framework and participatory multi-stakeholder discovery processes are needed.

## **Policy context**

The current global societal challenges that will define the coming decades, such as geopolitical tensions, rising social inequality, deteriorating public health, forced mass migration, food and water crises, biodiversity loss, environmental pollution, etc. (WEF, 2019), demand new approaches to industrial and innovation policies. These challenges cannot be addressed just by increasing the volume and the productivity of R&D and innovation activities, or just by changing industrial structure and improving operational efficiencies across the value chain. These challenges need to be addressed by discovering and promoting changes in the current socio-technical systems (Geels, 2002).

There is increasing evidence that "discovery-oriented innovation and industrial policies," including the concept of "ODP," are gaining traction and being put into practice by some European countries and regions (Bianchi et al., 2024). Policy practitioners are defining their discovery processes, offering an opportunity to study how the principles are being interpreted, adopted, and developed in real-world environments, as well as how the process is managed, under what conditions, and what other ideas or concepts are being adopted.

## Key conclusions

Open discovery processes support the emergence of a "discovery-oriented" industrial and innovation policy in various regions. These regions are aligning their Smart Specialization Strategies with the EU Green and Digital transitions, and are embracing new collaborative discovery practices, which are perceived differently from entrepreneurial discovery processes. The identification of problemdiscovery and system-discovery types of "discovery" reflects the regions' efforts toward transformative societal changes and their motivation to include a wider range of actors in innovation policy-making. However, the implementation of these new approaches remains an experimental practice. Additionally, there is a risk of challenge-drift, stemming from interference by higher levels of policy-making or from powerful stakeholders attempting to influence the process for their own interests. Addressing complex challenges requires discovery practices, involving an "open inquiry" and a collective action learning process. Finally, there is a lack of explicit use of experiments for policy-learning and identification of "emergent" behaviours, indicating dominance of "moonshot" approaches fuelled by ERDF funding.

## Main findings

The main findings are summarized in the table below, conceptualising policy and system discovery, highlighting set-up and needed capacities. Policy discovery involves the collective identification of specific challenges and the definition of future goals, while system discovery involves understanding the current state of the system and its stakeholders. These processes are used to address complex transitions and involve a wider range of stakeholders. They are initiated by regional governments or existing projects by local communities. Generally, all participating parties

needs specific capacities, such as the ability to facilitate engagement, adapt to the situation, and communicate effectively. Finally, it is important to approach these processes with creativity and not as a bureaucratic exercise.

Policy discovery	System discovery	Why use discovery processes?	Setup for the discovery	Needed capacities
<ul> <li>From global directionalities, broad set of stakeholders co- define their specific place- based challenges</li> <li>Collective identification and definition of the problem(s) boundaries</li> <li>General defined future "landing- zones"</li> <li>Hypothesise a change journey</li> </ul>	<ul> <li>Listening mechanisms and sensing the current state of the system</li> <li>Knowing who is who, who is doing what, how to enhance collaboration</li> <li>Define the boundaries of the system which is object of transformation</li> </ul>	<ul> <li>Follow up from previous practices</li> <li>Addressing wicked or complex transitions</li> <li>Involvement of a wider range of stakeholders</li> </ul>	<ul> <li>Regional government as the "owner" and initiator of the process</li> <li>Existing on-going projects or local communities as initiators of the process</li> <li>Higher levels of engagement are critical</li> <li>Managing risks of political "challenge-drift"</li> <li>Extension of the policy mix beyond R&amp;D and innovation</li> </ul>	<ul> <li>Capacities are needed in public administration, intermediary agencies and in private sector actors</li> <li>Capacities for "systemic transformation"</li> <li>Facilitation and engagement, ability to adapt to the situation, communication and creativity</li> <li>ODP should not be approached as a bureaucratic process</li> </ul>

## Related and future JRC work

The work is relevant for JRC's research and activities on transformative innovation policy. The findings and discussions presented in this study can provide valuable insights for shaping future perspectives and support the design innovation and industrial policies.

# 1 Introduction

Confronted with the consequences of global climate change and a health crisis (IPCC, 2023; IPBES, 2019) and with new geopolitical challenges (European Commission, DG R&I 2023), the European Union is rethinking its industrial and innovation policy approach, reinforcing the orientation towards resilience, autonomy and new social and ecological sustainability challenges. The new approach is currently being explored by EU territories but it requires a broader innovation policy frame and new participatory multi-stakeholder discovery processes to support innovation and innovation policy-making.

The social and ecological challenges that regions face cannot be addressed just by increasing the volume and the productivity of R&D and innovation activities, or just by changing industrial structure and improving operational efficiencies across the value chain. The new approach is concerned with the global societal challenges that will define the coming decades, such as: geopolitical tensions, rising social inequality, deteriorating public health, forced mass migration, food and water crises, biodiversity loss, environmental pollution, etc. (WEF, 2019). These challenges need to be addressed by promoting profound changes in the current socio-technical systems (Geels, 2002), that constitute the basis of our current way of life, e.g. cities, land use, transportation, energy, industry, infrastructure, food and water systems, etc.

The concept of "discovery" as a public-private, multi-stakeholder collaborative co-creation process that supports innovation and innovation policy making and learning has been referred in different streams of literature such as New Industrial Policies (Hausmann and Rodrick, 2003), Smart Specialisation (Foray et al., 2009) and more recently in Mission Oriented Innovation Policies (Mazzucato, 2018; Kattel and Mazzucato, 2018) and in Transformative Innovation Policies (Steward, 2012; Shot and Steimuller, 2018).

In the recent past the Entrepreneurial Discovery Process (EDP) established itself as an inseparable tool of Smart Specialisation Strategies – S3, providing a foundation for the selection of priorities – areas/sectors of competitive territorial advantage. EDP processes also played an important part in reconsidering and revising the priorities, by engaging the stakeholders in continuous discussions that would allow implementing changes, if needed, to the priorities or to the policy instruments and actions associated to S3 implementation (Gianelle et al., 2016; Guzzo and Perianez-Forte, 2019).

The change in the perception of the challenges and goals that now orient industrial and innovation policies (and in connection with other policy fields), means that the current programming cycle 2021-2027 and the next generation of Cohesion Policy could follow a challenge-led approach as a potential organizing principle based on place, people and performance (European Commission, 2024). A place-based challenge approach will however induce changes to the previous EDP practices that supported smart specialisation policies in Europe since 2012 (Reid et al., 2023). Discovery processes now need to mobilize a wider range of regional public and private actors, while maintaining engagement and ownership of the policy-making.

A decentralised policy agency and the engagement and collaboration of a wider range of actors has also been referred in the Mission Oriented Innovation Policy approach (Kattel and Mazzucato, 2018) and in the Transformative Innovation Policies literature (Haddad et al., 2022). With the aim of empowering and helping regions to adopt these new industrial policies and their associated "Open Discovery Processes - ODP" the Partnerships for Regional Innovation (PRI) Pilot Action - launched in 2022 by the European Commission Joint Research Centre (EU/JRC) in collaboration with the European Committee of Regions (CoR) – also provided guidance on how to change previous EDP practices and adopt some fundamental principles such as: continuity, openness to non-innovation performers, openness of goals to include societal challenges, openness of pathways so as not to favour any one solution. It also provided a stylised sketch of local missions or CHOIRs - CHallenge-Oriented Innovation paRtnerships (Pontikakis et al., 2022). Insights from previous S3 and EDP practices that may provide valuable guidance for this needed shift in innovation policy have already been thoroughly examined (Laranja et al., 2022), and recently following from insights of "The Square" (Schwaag Serger et al., Eds. 2023) and from further inputs provided by the Partnerships for Regional Innovation (PRI) pilot participants, the EU/JRC published an evolution of the PRI-Playbook into an ACTIONbook (Bianchi et al., 2024), that presents practices from the territories who are already experimenting with transformative innovation activities and suggests the use of a collection of tools.

Despite these general lessons from past EDP practices and guiding principles and tools for adopting new open discovery processes, much ambiguity remains regarding the precise nature and how the process is to be operationalised. Beyond the plea for policy experimentation (Mazzucato 2016; Wanzenböck et al. 2020; Ghosh et al. 2021) and the need for learning and building new policy capacity (Kattel and Mazzucato 2018; Borrás et al. 2023), available research offers little guidance for how public sector organisations or public-private partnerships can organise such processes of collective action capable of balancing the need for experimentation with the need for accountability (Radosevic et al. 2023).

Nevertheless, there is growing evidence that "discovery-oriented innovation and industrial policies" and in particular the term "ODP", and the concepts behind it, are currently gaining attention and being deployed by countries and regions in practice (Bianchi et al., 2024). By defining their discovery processes, practitioners are providing an opportunity to study it in the real environment, to understand how its principles were interpreted, adopted and developed further; how the process is being managed, in what conditions, and what other ideas or concepts have been adopted.

Therefore, by selectively revising the concept of "discovery" in different streams of literature and based upon semi-structured interviews with policy makers of five European regions (Catalonia – Spain, Dalarna – Sweden, Emilia Romagna – Italy, Northern Netherlands alliance, Västerbotten – Sweden), this study aims to contribute to a better understanding of what are these processes in practice and identify critical lessons for effective implementation of these relatively new practices, whereby a wider range of regional stakeholders engage in "discovery processes" to address societal challenges.

In Section 2 we make a brief revision related to the use of the term "discovery process" in different streams of literature, namely: on New Industrial Policies, on S3 studies, on "Transformative Innovation Policies – TIP", "Mission Oriented Innovation Policies – MOIP" and on Systems Innovation and Complexity approaches. Section 3 provides details on the research approach. Section 4 focus on identifying key insights across the case-study regions. Finally, Section 5 proposes critical lessons and suggestions to improve governance processes that support transformative innovation policies.

# 2 Discovery-oriented policies

The following sections succinctly revise the uses and interpretations of the term "discovery processes" in different but interrelated streams of literature with a focus on drawing relevant lessons to analyse how open collaborative governance and participatory processes are being practiced in different regions.

# 2.1 "Self-discovery" in new industrial policies

Studies in what some might call "modern" or "new" industrial policy (Devlin and Moguillansky, 2013), suggest that effective industrial policies require policy makers to have extensive knowledge about specific problems in their own contexts. This knowledge is difficult to acquire at the policy design stage, and therefore often causes policymakers (including administrative agencies and intermediaries) to use incomplete knowledge (Rodrik, 2004). On the other hand, relatively well informed industrial policies are often too narrowly defined or too generic to address the multi-dimensional, context-specific industrial and innovation problems (Hausmann et al., 2008). In addition, they often prove very difficult to be properly implemented, given that multi-level governance requires coordination and adjustment of different political and administrative restrictions at different levels (Andrew at al., 2017).

Therefore, some scholars have suggested that governments can avoid such mis-specifying and misestimating political and administrative capacities, by developing policy design and implementation mechanisms that foster and active "self-discovery process" of what their countries are good at, instead of passive expert-driven solution-setting (Hausmann and Rodrik, 2003; Rodrik, 2004). What this means is that it may be more effective to build "listening mechanisms" and "flexible response processes" through a policy discovery process, rather than continue with top-down approaches to policy strategy formulation that are usually undertaken with the help of policy advisors and experts with limited understanding of (or access to) real industrial and territorial contexts (Chang and Andreoni, 2020; Andrews and Harrington, 2023).

The process of "self-discovery" is defined as collaborative process for learning "what one is good at producing" (Hausmann and Rodrik 2003; pp. 605; Hausmann and Rodrik, 2006; Rodrik, 2004). Rather than top-down choices of which general market or institutional failures to tackle, or of which local champions to focus, or even of what kind of foreign investment to attract, Haussman and Rodrik argue that private and public sectors should work together to identify, explore and alleviate the constraints preventing innovation initiatives to emerge and diffuse.

The promotion of collaborative learning-by-discovery has therefore long been understood in the academia as essential for industrial policy-making processes. These processes of "discovery" focus on listening to gather information not just about general social, market and technological trends but also about specific constraints in their particular local industrial contexts, and on fostering close collaboration between the government and the private sector in order to become more flexible in responding to those constraints (Rodrik 2009, p.19).

Examples of such public-private collaborative processes of "learning-by-discovery" include the United States' 19th Century network of agricultural extension and engineering experimentation stations (Chang and Andreoni, 2019, p.14-16); the IRAP programme since 1947 in Canada (OECD, 2017); or the Steinbeis Foundation in Germany (Harding, 2002).

# 2.2 Discovery processes in Smart Specialisation Strategies

Based on these new approaches to industrial policy and following the concerns put forward by the "Barca Report" (Barca, 2009), the high-level "Knowledge for Growth" expert group (Foray et al., 2009), recommended Europe to adopt a new innovation policy framework named "Research and Innovation Strategies for Smart Specialization – S3", which became a prerequisite for regions to receive Cohesion Policy funding for R&D and innovation during the (2014-2020) programming period. This new S3 strategic framework required public private collaboration through Entrepreneurial Discovery Processes – EDP. EDP processes were defined as inclusive evidence-based process whereby stakeholders, including representatives from businesses, academia, government and civil society, co-define and prioritize research and innovation specialisation domains (Gianelle et al., 2016; Esparza-Masana, 2021; Santini et al., 2015).

In Smart Specialisation Strategies, "entrepreneurial discovery" differs however from the concept of "self-discovery" proposed by Hausmann and Rodrik (2003). While entrepreneurial discovery is defined as a collective policy-making process to help define R&D and innovation priority domains to concentrate efforts on projects and activities leading to industrial structural change, "self-discovery" is a process by which private and public sector discover and learn "what they are good at" producing and how to alleviate market constraints.

Introduction and operationalisation of the EDP concept in EU regions (European Comission, 2012), presented significant policy and governance challenges (Guzzo and Giannelle, 2021) and was followed by intensive experimentation and sharing of EDP practices among regions, which led to a conceptual reflection around the original EDP idea and the role of the stakeholders in the process. Hence, the EDP concept evolved from being a process limited to the identification of R&D and innovation investment-priorities at the design-phase of a regional innovation policy strategy, to a process that keeps going throughout S3 implementation (Gianelle et al., 2016, p.15; Marinelli and Perianez-Forte, 2017; Guzzo and Perianez-Forte, 2019), maintaining stakeholders engaged in the refinement and review of the initially defined priority-domains.

The introduction of S3 and EDP in Europe was a first attempt to break away from traditional topdown "innovation plans" and adopt new industrial policies which require collaborative and participatory processes based on the continuous engagement of a wide range of stakeholders. However, experiences with S3 and EDP varied considerably across Europe, reflecting remarkable policy capacity and institutional context differences between less-developed, intermediate and advanced regions (Trippl et al., 2020; Di Cataldo et al., 2021).

The European Union has now entered a new multiannual programming period from 2021 until 2027 that is framed by strategies for sustainable, resilient and inclusive growth, which underpin the 2030 Sustainable Development Agenda (McCann and Soete, 2020).

Within this framework, the Commission is requesting Member States and regions to continue to use Smart Specialisation Strategies but now defined as "place-based innovation-led transformation strategies" for growth and sustainability. Hence, while in the previous multiannual programming period 2014-2020 one of the major challenges with the S3 policy concept was how to implement Entrepreneurial Discovery Processes, in this new policy context implementation of some other form of "discovery" will again be a key aspect of place-based innovations for transformation.

Lessons from the experiences of EDP implementation that may be may be useful for understanding and further developing new ways of policy-making through open and participatory discovery processes were already proposed by Laranja et al. (2022).

However, while past experiences with EDP are a good basis for reflection, there is today a renewed interest in seeing how regions are effectively changing their EDPs and what relatively new or modified collaborative discovery process are being used to support the implementation these new place-based innovation-led transformation strategies (Reid et al., 2023; Pontikakis et al, 2022; Miedzinski et al., 2021; Nakicenovic et al., 2021) which for some cases may go well beyond previous S3 strategies and take a broader local innovation agenda oriented towards societal challenges and experimenting with new "discovery processes" to support the policy making process.

# 2.3 Discovery in Transformative Innovation Policies

Drawing on evolutionary economics, sociology of innovation and on sustainability research studies, a new type of STI policies labelled "Transformative Innovation Policies – TIP" (Shot and Steinmuller, 2018; Steward, 2012) aims to address the current social and environmental challenges by promoting radical shifts to more ecologic and inclusive "socio-technical systems" that do not compromise the planetary boundaries of a healthy biosphere (Rockström et al. 2009; Grin et al., 2010; European Environment Agency, 2019).

Socio-technical systems extend beyond individual industries or sectors to embrace whole value chains. They include not just business and technology dimensions but also infrastructure, cultural discourses, politics, regulation norms and routines, science and technology knowledge, as well as user patterns and diverse actors' interests. Some examples of socio-technical systems are: the energy system, food, mobility, healthcare, water, etc. (Geels, 2002; Shot and Geels, 2008).

Socio-technical systems co-evolve over time forming relatively stable configurations, which may became locked-in particular ways of serving society needs (Rip and Kemp 1998; Grin et al. 2010; Geels 2002). According to the MLP (multi-level perspective) model, major changes in these socio-technical systems involve interaction between three levels: the landscape level, the regime level and the niche-innovation level (Geels, 2018, European Environment Agency, 2019). For example, global trends at the landscape level may destabilise and cause imbalances and malfunctions on the current regime-system at the intermediate level, opening windows of opportunities for niche-innovation discovery at the lower levels (Geels and Turheim, 2022; Smith and Raven, 2012).

While this MLP view of socio-technical systems change acknowledges that the change process requires mobilisation of a broad range of actors and their coordination across governance scales and sectors, the term "discovery" is not usually associated to a type of governance or policy process, Instead it is associated with one key mechanism to break with the lock-in mechanisms in which socio-technical regimes may fall, which is the emergence of innovation-niches.

Nevertheless, we see policy discovery processes in what the TIP approach calls EPEs - Experimental Policy Engagements (Shot et al., 2019), which are needed to experiment with the creation of niche novelties as well as, in later stages, to experiment with how to mobilise, gain scale and support wider diffusion of innovations associated with a new regime (Ghosh et al., 2021).

The governance of such complex and long-term processes of socio-technical systems transformation may be associated to twelve "transformative outcomes" framed by three macro processes (Shot et al., 2019; Ghosh et al., 2021) – see Table 1 - which can also be used in a "formative evaluation" approach (Mollas-Gallart et al., 2021; Amanatidou et al., 2014; Arnold et al., 2018).

## Table 1. Transformative Outcomes

Macro processes	12 transformative outcomes in long term processes of socio-technical change
Building and nurturing niches	<ol> <li>Shielding</li> <li>Learning</li> <li>Networking</li> <li>Navigating expectations</li> </ol>
Expanding and mainstreaming niches	<ol> <li>5. Upscaling</li> <li>6. Replicating</li> <li>7. Circulating</li> <li>8. Institutionalising</li> </ol>
Unlocking and opening up of regimes	<ul> <li>9. De-aligning and destabilising</li> <li>10. Unlearning and deep learning in regimes</li> <li>11. Strengthening regime–niche interactions</li> <li>12. Changing perceptions of landscape pressures</li> </ul>

Source: Ghosh et al., 2021

In summary, while TIP approaches also see the governance of the innovation policy process as a journey that needs to be participated by a wide range of actors and stakeholders, it does not label this process as a "discovery" as in the "Smart Specialisation" approach. Instead, it uses the term "niche-discovery" to describe the first stages of the MLP model, and it suggests the need to use EPEs which we see as associated to collective "policy discovery processes" and to expected transformative outcomes.

# 2.4 Discovery in "Challenge-led" or Mission Oriented Innovation Policies

Mission-Oriented Innovation Policies - MOIP (Kattel and Mazzucato, 2018; Mazzucato et al., 2020) share the same concerns as TIP e.g. the importance of directionality, the focus on societal challenges and the need for behavioural or social change (Haddad et al., 2019, pp. 12-13). According to Mazzucato (2018), while the starting point of any MOIP is the deliberate formulation by political actors of top-level policy agendas, translation of these priorities into specific targeted missions is a "democratised", "joined-up" policy making process. Moreover, such process includes also "bottom-up" experimental learning associated with the definition and implementation of project-portfolios.

There are, however, different kinds of missions (Larrue, 2021; Mazzucato, 2018). The extent (or the degree of ambition) defines different types of missions and therefore it is important to clarify what types of "challenge-led" policies may use the "missions" label and what is the role of discovery processes in these different missions.

Wanzenböcket al. (2020) propose that "discovery processes" are needed to tackle wicked societal challenges which can be characterized by: contestation expressed in existence of different divergent claims; complexity related to the multi-scalar, multi-dimensional nature of the problem, and; uncertainty i.e. lack of knowledge and limited available evidence.

Another simple way to classify missions is to distinguish between "accelerator" and "transformer" missions (Wittmann et al., 2021). "Accelerator missions" focus on scientific research as a means to initiate the desired changes and/or on technological developments that have been identified as possible solutions to the underlying problems. The aim of "accelerator missions" is therefore to

reinforce scientific and technological solutions and accelerate their diffusion. "Transformer missions" go beyond science and technology and emphasise the importance of societal behavioural and institutional systemic changes, hence requiring involvement of a wider variety of actors and a governance approach capable to deal with potential resistance to systemic change by established actors.

Based on a collection of eight case studies around the world, the Mission-Oriented Innovation Network Case Book (Conway et al., 2021) offers an alternative way to classify the implementation of missions, namely:

- Top-down coordination to better align existing policy mixes
- Sectoral consensus building as a way to re-launch sectoral coordination market mechanisms
- Place-based approaches at the city or regional levels seeking to 'democratise' innovation to wider co-creation processes and civic engagement
- Design-led approaches to reframe siloed policy goals through user-centric' policy design processes that rely on deeper civic and stakeholder engagement

# 2.5 Discovery processes from other perspectives: systems innovation and complex adaptive systems

To complement previous perspectives on discovery processes in particular TIP and MOIP in this section we add to our understanding of what "discovery processes" are, the perspective of "systems thinking" (Cabrera and Cabrera, 2019) and complexity science.

In systems thinking (as in MOIP and TIP approaches) it is important to acknowledge that context matters. One useful framework that helps to make sense of context differences is the Cynefin proposed by David Snowden (1999). According to this framework, if the context is "ordered" i.e. if the region is facing "obvious" or "complicated" challenges, then clear policy goals, well defined "work packages" and adequate resources can be identified. On the other hand, if the region faces "complex challenges" then, there will be multiple overlapping interdependencies between problems in different domains. Complex challenges are wicked because they are ill-defined and contested at multiple levels.

For example, if a regional challenge is centred around "batteries-technology", "drugs for rare diseases" or on accelerating "adoption of digital technologies" without particular concerns of social and ecological change, then clear targets and work-packages can be identified and it is probably just a "complicated" not a "wicked complex" challenge. On the other hand, if the challenge is "complex" such as the challenge of "an ageing population", "adopting bio-economy principles" or "transforming an industrial value chain towards the circular economy", then it will require addressing many inter-related problems affecting many actors. Clear targets are difficult to establish and higher levels of collaboration between multiple stakeholders (private, public, third sector and civil society) is required.

Hence, policy making processes should be different according to the context or nature of the challenge. Ordered contexts are associated to what Frenken (2017) (based on the seminal work of Richard Nelson, 2011 "The Ghetto and the Moon") names "moonshot" challenges. In "ordered systems" changes in technology, regulation infrastructures and societal behavioural, or a combination of all these, will also be needed. However, informed choices and policy priorities can be

governed through a linear policy process, supported by expert advice. This is not to say that this process will not have its own specific difficulties.

When the context is "complex", not just "complicated", then it requires much broader systems transformation involving multiple overlapping interdependencies. In this case, policy-making needs to be governed by a collective discovery process that de-politicizes the "grand-challenges" and defines broad directionalities for experimentation with systems-level change. Complex challenges demand ways of governing and collectively acting that are to be discovered as the dynamics of system-change enfolds (Kuhlman and Rip, 2014). According to Wanzenböck et al. (2020) "moonshot" approaches have been used to tackle "ghetto-like" challenges leading to frustration and a sense that innovation is not contributing to solve the challenge.

The perspective of Complex Adaptive Systems – CAS (Holland, 2006; Dooley, 1997), often used in Transformative Social Innovation (Avelino et al., 2019), is also useful to understand the different contexts in which discovery processes may be undertaken. CAS are dispositional systems not causal i.e. there is no possibility to know how the system responds to particular inputs. There is no predictive causality. At any particular moment, a CAS is disposed to evolve in a particular direction and not disposed to evolve in all other directions. Complex adaptive systems evolve towards a new regime through intermediate states that act as developmental bridges between the old system structure and the new. A new intermediate stage emerges through the actions of semi-autonomous heterogeneous actors, which interact with one another in interdependent ways to produce systemwide patterns that leads to adaptive "emergent innovative behaviour". The adaptive response feeds back into the system and modifies it, taking the system to the next state.

The key issue in this Complex Adaptive view of how systems evolve, is that it is impossible to understand the whole system by simply looking at its individual parts, and that the collective emerging patterns that characterise complex systems are what leads transformation processes forward. Discovery in this perspective corresponds to sensing and understanding the emergence of these new innovative behaviours that originate in the system's past through experimentation.

This poses new challenges for monitoring associated to experimentation as a means to promote learning and adaptation. For example learning for "developmental evaluation", which consists of ongoing discussions about which information is needed to collect and analyse in order to support decision-making (Patton, 2010); learning to identify which actions and initiatives are working and why i.e. "formative evaluation", and; after reaching a new system stage, learning about differences between the current and the previous stage – "summative evaluation".

# 3 Exploring and operationalising the concept of open collaborative discovery processes: the research approach

While the concept of "discovery" as an open collaborative participatory governance process that supports innovation and innovation policy-making and learning, is increasingly referred in different streams of literature such as New Industrial Policies, Smart Specialisation, Transformative and Mission Oriented Innovation Policies, there is still little knowledge of how to effectively operationalise and support such processes.

Aiming to enhance our understanding of how are policy makers exploring these new discovery processes which support participatory governance of their challenge-led regional innovation policies we interviewed five regions: Catalonia – Spain, Dalarna – Sweden, Emilia Romagna – Italy, Northern Netherlands alliance, Västerbotten – Sweden.

Different reasons informed our selection of the regions. First, the cases represented different contexts. Second, all cases showed signs of some success in implementing Open Discovery Practices but in different degrees of maturity. Third, in all cases the JRC has frequent contacts in the scope of the PRI initiative, which would facilitate access to the policy makers.

The interviews conducted for the purpose of the case studies were carefully planned. The people interviewed in each region were selected based on the role they play in the regions. The interview-guide (provided in Annex 1) was sent to the interviewees in advance. The interviews were held online in January and February 2024 and lasted around 60-90 minutes each covering the following broad areas:

- What are the regions' definitions of the ODP concept? i.e. how regions describe or perceive ODP. Because there is no operational definition of ODP in any level of detail, but just general principles such as, openness to unusual innovation performers, openness of goals to include societal challenges regions where questioned about their understanding of what ODP is for them in their own context, i.e. of what is the discovery about and what needs to be discovered (rather than planned)?
- Why are regions using "open discovery processes"? i.e. what is the rationale or the justification for using this kind of processes in support of innovation and innovation policy making? As referred in previous sections, S3 strategies introduced in the Cohesion programming period 2014-2020 required regions to implement "Entrepreneurial Discovery Processes". However, the EU Green and Digital transitions provide a new policy frame which invite regions to use a more open and collaborative policy making process may in order to address these societal-challenges.
- How is ODP operationalised? Beyond exploring the regions' perceptions of the concept and the justifications for the use of a new policy-making process, we are also interested to know more about how such open collaborative discovery processes are being practiced, i.e. what processes may bring them about and how learning is done for understanding the broader challenges, the place-based-problems, and for understanding and sensing the system which is object of transformation. This includes particular governance aspects such as who starts (triggers) the process and what barriers/difficulties are regions encountering and in particular, the quality of stakeholders engagement and the use of social technology tools enabling to avoid reductionism thinking, bias, questions of legitimacy and decision making. Regions were also asked to share what kind of monitoring is being practiced and what they considered to be the results so far.

In the analysis of the interviews we followed an interpretive approach (Yanow and Schwartz-Shea, 2015) i.e. we focus on identifying what policy-makers considered important, to see if the emerging patterns in the answers help to clarify "what the process is" (for them), "why they are doing it" and "how are they implementing". The interview summaries were carefully reviewed and updated with the input of the respondents, as well as additional relevant information, suggested by respondents, in March/April.

Hoping to illustrate different contexts and pre-conditions, which are specific of each region, we used secondary information to learn about the institutional context of the territory as well as information on what policy capacities our interviewees point out to be key for implementing such open discovery processes.

Finally, while the five regions exhibit different approaches, our focus is not on "assessing" but essentially to understand "as is" i.e. how it is practiced and discuss commons aspects, differences across the cases and possible improvements.

# 4 Discovering innovation opportunities for place-based transformations: key insights from the case study regions

The following sections present and discuss our interpretation of insights taken from the interviews with the regions of Catalonia, Dalarna, Emilia Romagna, Northern Netherlands alliance and Västerbotten. A summary of each region's interview is provided in Annex 3. Main outtakes from the findings are summarized in the Figure 1 and discussed below in separate sections.





Source: own elaboration

# 4.1 Framing: What needs to be discovered (rather than planned)?

The open collaborative discovery processes in the five regions appear to include two types of discovery: problem-discovery and systems discovery.

## **Problem-discovery**

Regions understand that a higher level directionality is given (not co-created) i.e. it is set at the international or European levels and related to broader issues such as the United Nations 2030 Action Plan and the SDGs. However, they need to gather a broad set of stakeholders to co-define their specific place-based challenges. In all regional cases studies we found that there is a good alignment between high level EU digital and green transitions and the regional innovation policies. However, departing from a broad goal providing direction and intent, regional territorial place-based challenges need to relate to specific local imbalances and malfunctions. The definition of these local specific challenges is usually materialised in what the regions call "transformational goals", "shared agendas" or "common goals", that serve to mobilise stakeholders and to define the problem boundaries. For example, Dalarna defines what needs to be discovered as "joint goals" and the discovery is about visions of the future. Other regions such as the Northern Netherlands Alliance sees it as an "opportunities discovery". In Catalonia problem discovery is articulated through a

cross-departmental process named "Opportunities Discovery Mechanism" that brings together all relevant stakeholders in each challenge-driven shared agenda.

These regional ambitions appear to be closely related to the idea of a regional level "purpose" and therefore are more spacious and flexible than the traditional concept of policy objectives. Instead of a collection of objectives that are met (or not) over time, these regional ambitions with different denominations may perhaps be seen as future "landing-zones". What counts in the definition of these place-based "agendas" or "transformational goals", is not to meet clearly defined objectives, but instead to arrive somewhere within a general defined "landing zone". For example Västerbotten claims that if common goals are too broad, it will be difficult to engage regional actors especially companies. However, if they are too narrowly defined, this confines the scope for wider innovation ecosystem engagement. Hence, irrespective of their scope and specific purpose, in our interpretation these regional "common goals" or "transformational agendas", exhibit flexibility so that they can coevolve along with regional internal and external contexts. That is not to say that interviewed regions see accuracy and diligence as irrelevant. However, the interviewed regions acknowledged that challenges, such as for example "introducing principles of circular economy in the plastics industry", need to be relevant to the region's context but at the same time also need to be seen as "exploratory". Hence, there is no need to specify in great detail a specific end-state for the transformation process. For example, the Northern Netherlands Alliance wants to discover new opportunities for a circular economy in areas such as energy, health, agriculture and green chemistry, where they believe to have competences.

However, what needs to be discovered goes further. In our interviews some regions suggested that it is important to hypothesise a change journey, i.e. develop some kind of Theory-of-Change – ToC. It is important to develop policy narratives that connect the future with the present and highlight the gap between where the region is and where it needs to be in the future. Furthermore, the regions interviewed also highlight the importance of designing a roadmap that identifies and defines a portfolio of project experiments, covering not just research and innovation, but also infrastructures, business support services, training, diffusion actions, regulatory measures, etc.

## System-discovery

While having place-based transformational agendas or "missions" is a discovery of what the problem(s) are and how they relate to overall directionalities, all regions interviewed referred the need to listen, understand and sense the current state of the system – system discovery i.e. knowing who is who, who is interested in the challenges, who is doing what, how to enhance collaboration, etc. This enables to identify what is already going on that can be leveraged. Hence, one interesting finding is how regions define the boundaries of the system which is object of transformation (at what level?).

The regions interviewed appear to understand systems at the sectoral level including elements such as technology, science, common infrastructure, regulation, user practices and markets.

Some regions such as Emilia Romagna see the "system" as a cluster or a value chain and all the associated public and semi-public support infrastructures (e.g. business associations, technology and training infrastructures) which are seen as fundamental levers of change. Explicit reference to the conceptual notion of "socio-technical systems", Transformative Innovation Policy and a systemic understanding of socio-technical systems change using the MLP framework was found mainly in the case of Catalonia.

Västerbotten for example, sees the discovery process as going beyond definition of priorities and milestones and includes setting a "platform for people to meet and discuss" and for discovery of whether and how each actor can contribute to the "common goals". Dalarna sees this process of knowing your own system as a process of gaining trust and of clarification of the role of the public and semi-public stakeholders at multiple governance levels.

# 4.2 Why are regions using discovery processes?

Following from the regions' definition of discovery and problem-discovery and the system-discovery we looked at the rationales i.e. how regional policy-makers justify these new participatory policy-making processes. We found considerable variance in how regions justify the use of these processes.

In some cases, it is a follow up from previous practices, not just the Entrepreneurial Discovery Processes – EDP used in Smart Specialisation, but also other informal public-private collaborative practices that were already common practice in their regional governance culture. For example, in Emilia Romagna policy objectives expanded beyond co-definition of domains of specialisation and resulted in engaging with a wider range of participants. Likewise, in the Northern Netherlands Alliance, inclusion of social and sustainability challenges justified the need to open up the process, more than it used to. Moreover, in Dalarna the justification to open up the policy making process was based on the notion that the previous triple-helix innovation model based on the interactions between academia (the university), industry and government, was exhausted. In other regions, the justification put forward was the need to break with the traditional linear and departmentalized way of doing policy that does not appear to be producing the expected results.

However, regions have also referred to policy-ideas associated to challenge-led or mission oriented policies and to the Transformative Innovation Policies – TIP framework. Because place-based agendas are perceived as "wicked" or "complex problems" i.e. challenges with a high degree of uncertainty and involving social and political contestation, they require a wider and more open approach to governance. For example, Västerbotten seeks to use these processes to promote reflection not just about "efficient" use of resources or how to counteract the decline of young people in the rural areas, but essentially a reflection around how to "combine new economic diversification possibilities while maintaining or enhancing healthy socio-economic ways of living".

Overall, our interpretation is that the regions are committed to open discovery processes, because addressing wicked or complex transitions towards sustainable socio-economic models at the territorial level, requires the involvement of a wider range of stakeholders. This wider involvement is needed not just to create a shared understanding of the intended place-based transformations, but also to promote collaboration, which is needed to set up initiatives and actions, aligned with the transformative goals and to promote group learning and adaptation associated with changes in the system as the change process progresses.

# 4.3 Probing: how is it to be discovered?

In our interviews, we found that regional government is usually seen as having a mandate to initiate and coordinate the discovery processes, and thus is seen as the "owner" of the place-based challenges. In some cases, the initiative appears to rely on key "institutional entrepreneurs" i.e. on

small teams from public administration and from public intermediaries who initiate or build upon existing processes.

However, there is no "one way" to start the discovery process. While government may be the most frequent initiator, the process may start from within existing on-going projects promoted by businesses, by social enterprises or by local communities that are aligned with the regional transformational goals. In Västerbotten regional authorities make the first "call to the table" and then other actors may continue to curate the discovery process. Likewise, in Dalarna, regional actors can present their needs to regional authorities, who then activates the collaborative discovery process.

In Catalonia, any actor that relates to a challenge and has some agency can propose projects that contribute to the directional goals. Catalonia has recently launched the "Regions Knowledge Programme" to encourage regional partnerships to come forward with joint-proposals involving university research centres, government and private sector, oriented to their shared agendas.

Regardless of where it starts, the coordination appears to rely not on new structures but on the evolution or re-purposing of existing coordination mechanisms such as "steering committees", "management teams" and "working groups". Interestingly, all regions referred to the need to have a stronger collaboration from the universities in following up the process. Implementation relies essentially in regular meetings, round table discussions, workshops or "innovation camps" organised by the management teams and working groups.

With regards decision making, regions reported to privilege consensus over consent and expressed that higher levels of engagement are critical, not just to keep participation open and identify unproductive biases, but also to see whether there is a good balance of individuals, organisations, or consortia who relate to the specific challenge.

Measuring, signalling and making sense of how change is happening was also referred as an important part the discovery processes. In general, the interviewed regions recognize that there are limitations in current monitoring approaches when it comes to monitor system level changes. However, in the absence of viable alternatives regions tend to predominantly use adaptations of existing monitoring and evaluation mechanisms. The need to change "monitoring" approaches is widely acknowledged, but beyond inclusion of ever more data and indicators, it appears there is little knowledge of how to change current monitoring procedures so that they would capture early signals of systemic changes.

With regards, results being achieved so far, the case study regions referred to progresses in highlighting the need to tackle complex challenges through collaborations. For example, in the Northern Netherlands Alliance, stakeholders became increasingly aligned with a new narrative about the transformative strategies and, in addition, there is more collaboration and interactions between stakeholders. Catalonia referred to pilot projects or demonstrators in the scope of the shared agenda of Terres de Lleida, Pirineu i Aran (supporting the circular bioeconomy to address depopulation in rural areas) as an example of early results.

In our interviews with regional policy makers, we learned that there might be risks of "challengedrift", which are associated to top-level politics. Policy imitation permeates the political arena, which in some cases appears to disturb these wide participatory process. Some regions reported that toplevel politicians are more concerned with flagship initiatives and with delivering quick wins or quick fixes, than they are with system transitions that take much longer to be accomplished. In addition, because of this misalignment in vertical governance, lower level agencies and intermediaries are sometimes left with relatively little support from the top. When political support from the top is relatively weak, another discovery risk reported is that dominant actors in the region may take over the process and control its development. In our interviews, we learned that powerful large firms and universities, particularly in low-density regions, might end up controlling the process and attempt to transform it in some kind of "systems change washing".

Finally, regions referred to risks related to the policy-mix. Place-based challenges cannot be tackled by focusing only on the alignment of R&D and innovation with the identified challenges. Although this is the requirement for the use of ERDF funds to support S3 as place-based innovation strategies for sustainability, the policy-mix needs to go beyond R&D and innovation. In other words, there is a risk of considering science and innovation policy as the only policy domain associated to these new policy-experimentation approaches, while other policy domains addressing the same challenges e.g. education, social, health policies, remain using traditional policy approaches and the same funding instruments.

# 4.4 Policy capacity

Discovery practices are being implemented in specific regional contexts and cultures and therefore "capacities" to implement, reflect existing strengths and weaknesses, not just in public administration but also in private sector actors.

Our interviews did not identify precisely which competencies and combinations of skills associated to the practices of open collaborative processes are needed. All regions acknowledge that while there may be some small exceptions, in general public administration is not equipped to adopt policies for "systemic transformation". The most frequent skills needed pointed out were "facilitation", "engagement", "ability to adapt to the situation", "communication" and "creativity" skills. Beyond these general skills, regions also pointed out the need for individual training and learning. In addition, regions see these skills to be acquired not just by "formal" training, but also essentially by practice – learning by doing. In regions such as Catalonia and the Northern Netherlands Alliance, Universities were referred to have an important role in helping to capacitate the actors and in setting "action research" initiatives which would help in making sense of the initial conditions for systems change as well as following up and monitoring the discovery processes. It was emphasized that ODP should not be viewed as a bureaucratic process, and as such, a degree of informality, open-mindedness, and adaptability should be maintained.

# 5 Conclusions

Although the studied cases of open collaborative participatory practices in different regions are all at an early stage, which makes it difficult to extract any definitive conclusions, in this section we summarise and extend the previous discussion.

Our study suggests that some form of "discovery-oriented" industrial and innovation policy is making its way in these five regions. These policies are supported by "open discovery processes" that appear to be different from "entrepreneurial discovery processes" practiced during the first S3 cycle 2014-2020. Interviewed regions appear to have evolved and are willing to extend the collaboration between managing authorities and external stakeholders and to try out flexible "listening mechanisms" (Andrews and Harrington, 2023).

In the current Cohesion framework of 2021-2027, EU regions are expected to align their placebased Smart Specialisation Strategies with the EU Green and Digital transitions. In order to use EU funds under Policy Objective 1, EU regions were asked to comply with the S3 "good governance" enabling condition<sup>1</sup>. However, is it interesting to note that while this enabling condition does not specify whether "good governance" is to be associated with wider and greater openness or with the use of participatory mechanisms, these processes are nevertheless being adopted by the regions included in this study.

Using the mission's typology proposed by Conway et al. (2021), in the regions studied we identify "top-down alignment" i.e. a focus on regional government coordination, which nevertheless seeks to open up the process to wider participation of the local communities, helping groups of actors to come forward with initiatives which are aligned with the regional transformative goals. Because this collaboration is now more extensive to private and non-governmental stakeholders (also more intensive), regions perceive these new open collaborative discovery practices as relatively more difficult to operationalise.

We also found that these relatively "new approaches" to collective industrial and innovation policymaking involve two distinct types of "discovery".

First, the discovery of how to go from global directionalities to regional specific place-based agendas – which we labelled the process of "problem-discovery". This first discovery results in the definition of "transformational agendas" or "transformative goals" which are an intermediary layer used to surmount more concrete roadmaps of actions and projects. To some extent this is similar to Mazzucato (2017) proposes for the design of mission-oriented innovation policies.

Second, the discovery associated with understanding, and sensing the system. This involves the identification of who is who, and who in the territory is already working in the direction of the

<sup>&</sup>lt;sup>1</sup> The enabling condition 'Good governance of national or regional smart specialisation strategy' is applicable to specific objectives 1.1 Developing and enhancing research and innovation capacities and the uptake of advanced technologies and 1.4 Developing skills for smart specialisation, industrial transition and entrepreneurship. European regions need to incorporate the following in their smart specialisation strategies: 1. Up-to-date analysis of challenges for innovation diffusion and digitalisation; 2. Existence of competent regional / national institution or body, responsible for the management of the smart specialisation strategy; 3. Monitoring and evaluation tools to measure performance towards the objectives of the strategy; 4. Functioning of stakeholder cooperation; 5. Actions necessary to improve national or regional research and innovation systems, where relevant; 6. Where relevant, actions to support industrial transition; 7. Measures for enhancing cooperation with partners outside a given Member State in priority areas supported by the smart specialisation strategy

defined agenda i.e. the identification of "pockets of the future found in the present" (Sharpe et al., 2016). It also involves identification of resistances and difficulties to change. We labelled this as "system-discovery" and it involves the creation of platforms that enable diverse actors and stakeholders to convene not just to co-define shared goals and agendas, but to harness their collective intelligence and define actions that have potential for transformation.

In relation to the first type of discovery, one interesting aspect is how regions perceive their placebased challenges. The regions studied are not just attempting to optimize or extend what they already do i.e. as far as we could see the agendas are truly transformative and are not just about technology, industrial diversification and efficiency. Indeed the agendas formulated resemble "transformer" missions (Wittmann et al., 2021) aiming for profound societal changes that may take 20 or 30 years to accomplish.

Our case study regions also suggest there are different reasons justifying the use of new approaches to innovation policy making. The growing popularity of the policy discourse around mission-oriented and transformative innovation policies has some influence. The need to adapt previous EDP practices is also a strong motivation. In addition, regions referred to the need to break with the traditional departmentalised approach to innovation policy-making and to the need to include actors other than the usual triple or quadruple helix suspects. Gathering actors and knowing their activities is needed to reflect about how can diversified economic specialisation be promoted and reconciled with maintaining or enhancing a healthy social and ecological way of living.

While the perceptions of what these relatively new open collaborative and participatory discovery processes are and the reasons why they need to be adopted are relatively clear, implementation remains an emerging experimental practice and a challenging prescription for the regions.

The public authorities in general, drive the discovery process, though in some cases, new or ongoing initiatives of regional actors may also trigger and leverage a wider participatory process facilitated by regional authorities. Implementation relies essentially in regular meetings, workshops or "innovation camps". Focus group meetings are also utilised. These events tend to be mostly informal. Largely these events and group meetings are associated to existing or re-purposed coordination mechanisms that include high-level steering committees, middle-level management teams that support the whole process, and working groups.

While decision by consensus is privileged, one important difference is that regional government and their public administration units managing the process, appear to be more aware of the lobbying and power struggles that are part of the process, in particular of resistances and attempts to influence the process coming from dominant actors. Our limited evidence appears also to suggest that for regions where public-private collaboration was already an established cultural tradition, these processes of collective collaboration and discovery are relatively easier to practice.

Another important implementation aspect relates to ERDF funding of the roadmaps and actions that materialise such wide and ambitious agendas for transformative change. Apart from the usual claims that funding rates could be higher, ERDF support to implementation is limited to the thematic objective on research and innovation. However, regional transformative change often requires to go beyond R&D and innovation and include funding instruments for infrastructure and/or for education, training and new skills. The policy mix also needs to go beyond funding instruments and could in some cases include regulatory changes as well as measures directed to public procurement and measures to help shift consumer behaviour.

However, addressing wicked problems in complex systems requires (problem and system) discovery practices, which are closer to an "open inquiry", i.e. a collective action learning process. In our

interpretation, while the place-based agendas aim to address complex wicked challenges, absence of an explicit use of experiments with the intention of policy-learning and possible identification of "emergent" behaviours, suggests that the "moonshot" approaches fuelled by ERDF funding dominate. In addition, in wicked challenges, problem definitions evolve and change with the change process, therefore and although all cases are at very early stages, we expected to see references to how the agendas or transformative goals are changing. Hence, learning by discovery, based on probing and experimentation, enabling double and triple loop learning (Argyris and Schön, 1978) is relatively scarce.

Although the studied cases are all at an early stage, it appears that visible results relate to changes in the way the strategy scope is designed and to a better alignment of regional stakeholders with a new policy narrative associated to socio-technical and ecological change. There are also some visible results in "shielding" the agendas from short-termism which strongly relates to the "building and nurturing niches" transformative outcomes put forward by Ghosh et al. (2021) presented earlier (see Table 1). However, there appears to be no "Experimental Policy Engagements" (Shot et al., 2019), i.e. although "problem-discovery" is well identified, "solution-discovery" in particular innovation policies experimentation through EPEs, not so much innovation projects experimentation, may need to be further developed In addition monitoring practices appear to be difficult to change and use for "formative evaluation" (Mollas-Gallard et al., 2021).

Finally, other interesting aspects associated to open discovery processes is the risk of challengedrift, coming from negative interference of higher levels of policy making, who demand "quickfixes", or from large powerful stakeholders who attempt to appropriate and influence the process towards their own interests.

# 6 Policy challenges

In our view, there are a number of potential opportunities to improve the open participatory practices observed, summarized in the Figure 2 and discussed in the chapter below.

Figure 2	. Improvement	directions	for open	participatory	processes
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System thinking	<ul> <li>Understanding of system boundaries</li> <li>Deeper analysis of system values and beliefs</li> <li>Space for iterative double/triple loop learning</li> </ul>
Policy experimenting	<ul> <li>Set up of policy experiments for learning what works</li> <li>Use of impact hypothesis and agile projects portfolio approach</li> </ul>
Social technology tools	<ul> <li>Enhance the quality of the participatory process</li> <li>Help to mitigate resistance and to expose the existing controlling structures</li> </ul>
Monitoring, learning and evaluation	<ul> <li>Reoriented to detect early signals of emergent behaviours in the system</li> <li>Use monitoring to revise agendas, roadmaps and Theory of Change</li> </ul>
Capacitation	<ul> <li>Use "learning networks" and communities of practice</li> <li>Form partnerships with local universities</li> </ul>

Source: own elaboration

## Policy challenge 1. Systems thinking

We have seen no narrow focus of the missions or "transformative agendas" defined by the regions. The challenges are broad and correctly perceived as wicked. However, socio-economic systems operate as complex dispositional systems with many parts that interact dynamically, process information, and adapt their behavior (Beinhocker, 2007). Regions attempting to address relatively complex and wide place-based problems, could benefit from a more explicit and methodological use of systems thinking (see Burkett, 2023). This would enhance their understanding of what the problems are and of what's happening in the system they are trying to change. It would also enable to go deeper into a more reflexive analysis of system structures, values and beliefs, and aim at the root causes of the interconnected problems. In other words, to increase effectiveness, the participatory process needs to create space for iterative "recursive processes" where provisional agendas and roadmaps as well as temporary understandings of system boundaries, are revised based on adaptive second and triple loop learning (Argyris and Schön, 1978; Johannessen and Hahn 2013).

## Policy challenge 2. Policy Experimenting

Rather than viewing policy effectiveness through the lenses of single interventions and respective risk mitigation activities, systemic shifts requires to tackle uncertainty through multiple tentative solutions to the challenge. One potential gap in the regions interviewed is the lack of an explicit reference to policy experimenting i.e. to multiple Experimental Policy Engagements - EPEs (Shot et al., 2019) oriented towards learning what specific outcomes would trigger larger systemic changes. Currently, implementation rests in the ability to create some kind of distributed agency i.e. is supported by the ability to empower actors to go forward with initiatives towards a shared goal. Therefore, there is an opportunity to further extend some form of embedded policy experimentalism along the process (Gronchi, 2024).

In addition, there is a need to recognise that the usual single-project-by-project approach common in the use ERDF funding instruments, is not sufficient to unleash transformative dynamics, and therefore there is a need to adopt a projects "portfolio" approach. In constructing such strategic projects portfolio approach, what matters is not just the projects' individual merits but also the combined effect that a set of projects may have in unlocking or accelerating systemic transformational changes. Moreover, such experimental policy engagement may be associated to some kind of "agile approach" to portfolio management whereby aggregate "impact hypothesis" are to be associated to experiments and sets of projects.

## Policy challenge 3. Social Technology Tools

Social technology tools are necessary to enhance the quality of the participatory process, help actors develop mutual trust in each other and to incentivize collective action. The use of these tools may accelerate the discovery processes in different ways: by helping actors to deal with uncertainty, with knowledge and expectation alignment, and by inducing social learning.

Discovery processes need a governance designed to instil openness and freedom to operate, while providing an effective "contained social space" enabling to accommodate controversy, avoid systematic exclusion of unusual actors, balance the distribution of rewards, etc. Absence of a more explicit use of "social technology" tools suggest that regions are paying insufficient attention to the quality of the participatory engagement of stakeholders/actors in the open collaborative process (see Laranja, et al., 2022). In order to determine shared goals and decide the way forward together, regional stakeholders need to be aware of their different interpretive frames associated to the topics or challenges in discussion. There is a wide variety of event-formats and of visual tools and methods to stimulate "dialogic communication" i.e. "a style of communication that respectfully encourages others to want to listen, while also listening in a way that encourages others to want to speak" (Huisman et al., 2019, p. 39). These event-formats and tools that support participatory processes should be used to help open up the process. Open in a wide sense i.e. not just open to many common and uncommon voices (who generate controversy), but also open to discover what is possible, probable, what are the root problems, what pathways are preferable and how to best use the system resources and capabilities to explore these pathways. These formats and tools are often used in action research, dialogic communication and in human-centred design and systems thinking. The use of "social technology" tools can also help to mitigate resistance and to expose existing controlling structures. Finally, low quality participatory approaches may turn up producing some kind of "re-labelling" of traditional policies that are usually designed and implemented through "participated" processes, not necessarily "participatory".

## Policy Challenge 4. Monitoring as an input for learning and formative evaluation

Regions recognise that tangible transformative outcomes will take time to accomplish (probably more than just one S3 cycle). Results so far appear to relate to the first stages of "building and nurturing niches" (Ghosh et al., 2021), in particular concerns with "shielding" (Table 1) is notable in some regions.

Following from the need to have a more explicit orientation to experimental policy engagements, associated to impact hypothesis, monitoring needs to play a more important role as input for "formative evaluation" (Mollas-Gallard et al., 2021), i.e. needs to be reoriented to detect early signals of emergent behaviours in the system arising from the experiments. However, assessing in real-time the degree to which the experimental interventions are progressing, may only be possible if based upon "participatory monitoring", i.e. involving all the actors as sources of information, and therefore requires considerable efforts and resources. Nevertheless, agendas and their roadmaps (and ToC) should be revisited as part of the real-time evaluation of the systems-level change progress and should remain flexible and open to changes. A stronger partnership between regional authorities and their universities enabling to research how to set up this new type of monitoring and formative evaluation is highly recommended.

## Policy Challenge 5. Capacitation

Finally, another major challenge appears to be policy capacity. Without proper capacitation there is great risk of challenge-washing i.e. policies which are labelled as transformative or mission S3 but largely correspond to past innovation policy approaches.

While it may be too early to identify which "transformational failures" may arise (Weber and Rohracher, 2012) if any, our cases studies suggest that these new collaborative discovery processes need to have strong support from the top-level political bodies. In addition, they require different policy capacity skills. Existing or re-purposed STI agencies and intermediaries cannot be expected to implement transformative innovation policies, oriented towards long-term socio-technical regime changes without proper training. Capacitation actions to help build systems thinking and adaptive capacity into public organisation's decision making and operations is therefore a key aspect. While interregional collaboration may contribute to learning and capacitation, these skills need to be acquired essentially by "learning by doing". In addition, local partnerships with universities, multi-stakeholder "learning networks" and communities of practice to acquire new skills while attempting to implement the processes, may be a good way to help capacitate local actors and local public administration.

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# List of abbreviations and definitions

Abbreviations	Definitions
ART-ER	Attractiveness Research Territory Emilia-Romagna
CAS	Complex Adaptive Systems
CHOIRs	CHallenge-Oriented Innovation paRtnerships
CoR	European Committee of Regions
EDP	Entrepreneurial Discovery Process
EPEs	Experimental Policy Engagements
ERDF	European Regional Development Fund
EU JRC	European Commission Joint Research Centre
IRAP	Industrial Research Assistance Program
MLP	Multi-level perspective
MOIP	Mission Oriented Innovation Policies
NNA	Northern Netherlands Alliance
ODM	Opportunities Discovery Mechanism
ODP	Open Discovery Processes
PRI	Partnerships for Regional Innovation
R&D	Research and Development
S3	Smart Specialisation Strategies
SDGs	Sustainable Development Goals
SMEs	Small and medium enterprises
STI	Science, technology, innovation
TIP	Transformative Innovation Policies

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# Annexes

## Annex 1. Semi-structured interview guide

The semi-structured interviews with regional innovation policy authorities that focus essentially on the following issues:

## 1. Why is your region using "open discovery processes"?

How the region does perceives the nature of the problem to tackle?

Is ODP connected to a TIP or a "mission" oriented policy?

What are the main drivers of the practice of what you name ODP?

## 2. What needs to be discovered?

How do you define your ODP process?

What is to be discovered in ODP (rather than planned)?

(What results of this process of discovery?)

What is the format (how you name it) of the goals of ODP in practice?

Are these "given at higher level" e.g. SDGs and then worked out into place-based challenges of missions?

Is there a danger of entering into some kind of 'mission washing' – or just re-labelling existing policies?

## 3. How is ODP operationalised? (how is it to be discovered?)

How is the process put to practice?

How is information and insights about specific place-based problems, needs and opportunities acquired?

Who owns/facilitates/drives the process? Who starts the process?

Are there questions of legitimacy in the process?

What tools ad methods are used to ensure stakeholder engagement in ODP?

How it is ensured that the process remains open?

What are the main barriers and difficulties associated to the implementation of ODP?

What monitoring processes are used?

What are the results of your ODP process? (despite being early days)

Is the ODP process is supported/ associated to funding instruments?

## 4. What policy capacities are needed to implement ODP?

What kind of skills and capacities are deemed necessary for ODP process?

How this new way of doing and learning policy (design and implementation) through ODP was acquired?

## Annex 2. List of Interviewees

Catalonia – Spain	Tatiana Fernández
Dalarna – Sweden	Eva Lundin Rasmus Bergander
Emilia Romana – Italy	Elisabetta Maini Angelica Laterza
Northern Netherlands alliance	Luc Hulsman
Västerbotten – Sweden	Marta Bahta

## Annex 3. Summary of the interviews

## 1. Catalonia

#### Short characterization of the region

Catalonia is located in the north-east of Spain and it is divided into 4 main provinces: Barcelona, Tarragona, Lleida and Girona. It is one of Spain's richest and most highly industrialised regions. Tourism is an important part of Catalonia's economy, but it is manufacturing that makes the region Spain's economic powerhouse, along with a growing service sector.

#### Problem-discovery

The discovery process in Catalonia's S3 is articulated through the "Opportunities Discovery Mechanism". This Mechanism ensures that the relevant stakeholders in the system (public administrations, universities, research and technology centres, companies and civil society organisations and associations) are actively involved in place-based and challenge-driven shared agendas to accelerate green and just transitions. Through their involvement in shared agendas stakeholders participate in the processes of defining and prioritising problems, opportunities and initiatives.

The Opportunities Discovery Mechanism (ODM) is a cross-departmental service of the Catalan government to support the development and implementation of Shared Agendas, co-financed by ERDF. It is organised in seven technical offices, one for each of the priority areas of RIS3CAT 2030, assigned to the governmental departments with the main policy competencies in each of the areas, under the coordination of the Department of Economy and Finance. The importance of this set-up cannot be overstated: the ODM formally requires each regional government department to reflect on the systemic transformation opportunities within their area of work and on the support of stakeholders therein. In other words, through the ODM the RIS3CAT breaks silos across governments by providing a mechanism to coordinate, support and stir bottom-up engagement. The nature of S3 as cross-cutting knowledge-based strategy is empowered through this governance structure.

#### System-discovery

The RIS3CAT 2030 logic of action is based on the Transformative Innovation Policy approach (TIP) and the Multi-Level Perspective (MLP) framework. Shared agendas articulate the collective action of multiple stakeholders to address place-based systemic challenges while contributing to S3 priorities. The first step is to lay the foundations for transformative collective action. This preparatory work is based on three elements: 1) The collective envisioning of a place-based desired future linked to the challenge and aligned with S3 priorities. 2) A systemic understanding of the challenge and the socio-technical systems in which it is embedded (taking into account the multiple dimensions of socio-technical systems) their dominant practices, their configuration of actors and the rules structuring the relations between them and their behaviour. 3) The identification and connection of actors aligned with the shared vision of the future, who are already experimenting with alternatives to the current dominant practices (the so called "pockets of the future in the present" according with the 3 Horizon frame).

#### Why is the region practicing ODP?

Current social, economic and environmental challenges are very complex and very broad and they occur in contexts of high uncertainty and volatility. Governments cannot address these challenges with the traditional linear instruments and approaches Therefore they have no solutions, they cannot be addressed with linear approaches or with traditional action plans that are not fit for contexts of high complexity and uncertainty. Governments need to work with research and innovation agents, companies and civil society, adopting systemic approaches, identifying leverage points and acting on them to generate cascade effects that accelerate system change. As the European Commission and the JRC recommend, S3 is about putting place-based innovation policy for sustainability at the centre of policymaking. The theory is clear, to put this in practice is much more complicated. The ODP is an invitation to explore and test methodologies, tools, policies and social practices for the challenges of the XXI century.

## Who drives the process?

RIS3CAT 2030 combines top-down and bottom-up approaches. The Strategy prioritises seven systemic transformations:

- A sustainable, fair, equitable and healthy food system
- An environmentally friendly, emissions-neutral energy and resource system
- A sustainable mobility and logistics system
- A universal, sustainable and resilient social and healthcare system
- A sustainable and competitive industrial system
- A reflective, proactive, inclusive and responsive education and knowledge generation system
- A cultural system that integrates people, territory and history

All actions are challenge-driven and place-based and they require coalitions of stakeholders wanting to address a complex challenge while contributing to the RIS3CAT transformations.

Shared agendas are multi-actor and they are articulated bottom-up with the support of the Government (Opportunities Discovery Mechanism) and of universities and research centres (Knowledge Regions Programme, a call with 30 million euros from ERDF to engage researchers in place-based social and environmental challenges, collaborating with policymakers, companies and civil society. The shared agendas of Terres de Lleida, Pirineu i Aran and of Manresa-Bages are good examples.

#### Engagement

The starting point of the initiatives is a place-based complex challenge or problem affecting diverse stakeholders that yet do not have a solution. Those stakeholders, wanting to address the problem contributing to the S3 priorities, are the ones initiating the opportunities discovery process. The Catalan Government supports these processes through the Opportunities Discovery Mechanism,

engaging all the necessary departments. Universities have a relevant role too in supporting these processes, through the Knowledge of Regions Programme.

#### Openness of the process

The main priority is creating collaborative learning spaces in which policymakers, researchers, entrepreneurs, and citizens work together to generate alternatives to address place-based social and environmental challenges, articulating coalitions of the willing with the capacity for system change. The alternatives developed in these spaces are not based solely on technology but also on new social practices, including changes in policies, mental frames, narratives, values, and behaviours. The region is developing its own methodology for innovation camps, challenge-driven workshops in which diverse stakeholders aligned with the RIS3CAT priorities and affected by a place-based challenge, work together to develop alternatives to current unsustainable practices. Government and universities in the region are training facilitators to support these discovery processes. One of the main objectives of this process is to explore and develop new ways of collaboration among diverse stakeholders to drive transformative action. Policy makers engage in these processes together with the other stakeholders, since social and environmental challenges usually require changes in all the dimensions of socio-technical systems (governance, policies, markets, science and technology, infrastructures, use of soil, financing, cultural values).

#### Legitimacy

RIS3CAT 2030 priorities and governance have been approved by the Catalan Government. All the initiatives have to be aligned with RIS3CAT 2030 priorities contributing to the systemic transformations. Through the shared agendas, stakeholders explore and test alternatives to current unsustainable practices to address the current social and environmental challenges more effectively. The result of the opportunities discovery process can generate changes in policies, priorities, business models or value chains, since this is the main objective of S3: to generate alternatives to current unsustainable practices. The decision to implement or not implement those changes is made by the actors with the legitimate authority to do so. The strategy recognises that the necessary transformations for green and just transitions generate conflicts, tensions and sometimes opposition, therefore, consensus is not possible. It is necessary to generate spaces in which diverse alternatives can be explored and discussed. Shared agendas are about bridging the gap between what society (people) deeply cares about and the current situation with problems of pollution or social injustice. It is important to generate capacity to avoid that vested interests stop Government and other actors of doing what is so urgently needed.

#### Monitoring

RIS3CAT 2030 monitoring system focuses on understanding transformative processes; this is how the actions framed in this strategy and, in particular, in the shared agendas, contribute to articulating sustainable value chains or promoting new business models, social practices or policies supporting green and just transitions. These transformative processes are complex, as they involve interrelated changes in very different areas (such as the production systems, technologies, markets, regulations, user preferences, infrastructure, and cultural expectations). Accordingly, the monitoring system includes and combines different sources of information and types of quantitative and qualitative analysis. Visualisation tools to understand the evolutions of collaborative networks and of emergent priorities and approaches to address complex challenges are a central pillar of the monitoring system. The Catalan Government is working with a formative evaluation tools supporting learning and discovery processes. Theories of change and transformative theory of change is a central element for the Strategy and for the shared agendas. Formative evaluation approaches and monitoring, evaluation and learning frameworks (MEL) are a central element.

## Results and risks

The RIS3CAT 2030 logic of action is based on the TIP approach and the MLP framework. The starting point is that current societal challenges cannot be addressed through science and technology or public policy alone. Instead, addressing these challenges requires the transformation of the socio-technical systems involved and profound changes in dominant practices (or business as usual). The TIP approach understands the transformation of socio-technical systems as an evolutionary process characterized by multiple variables that interact with each other and co-evolve in space and time. Global trends and other exogenous shocks (such as climate change, population ageing or wars) create tensions in regimes, which due to their stable nature tend to be rigid and resistant to change. When regimes do not adapt sufficiently to the changing environment, they become dysfunctional (they don't efficiently and effectively perform their functions) and vulnerable (they are questioned). This opens up opportunity windows for some alternative practices to expand and, eventually, transform or replace the dominant practices.

In this context RIS3CAT 2030 can be defined as an anticipatory policy, which projects different future scenarios and define shared visions of the future, anticipating challenges that will emerge in the trajectories of change and devising strategies to tackle them. This is why the key priorities are to create collective learning spaces to explore and develop alternatives and to create capacity building for transformative innovation and system's change. The first pilot projects or demonstrators started in 2014-2020 period. They are the shared agendas of Terres de Lleida, Pirineu i Aran (supporting the circular bioeconomy to address depopulation in rural areas) and of Manresa-Bages (supporting new business models and practices to address the problems related to the aging population, while improving its wellbeing. RIS3CAT 2030 promotes the methodology of shared agendas to accelerate green and just transitions. There is not guarantee that will achieve this, but in any case, it will have opened some new alternative pathways and created new collaborative networks supporting these processes.

## Policy capacities

Capacity building in public administration is a central element in Catalonia's S3. Through the ODM, the Catalan Government has created 18 new positions with a new professional profile, integrated in 8 departments and working together with the staff of these departments and as a network. The ODM staff are applying a systemic and transformative innovation logic in their activities and have the mandate to engage with challenge-driven and place-based shared agendas to support the opportunities discovery processes.

Some of the characteristic skills for this new profile of policy makers are: systemic understanding of complex place-based challenges; capacity to facilitate workshops, to engage stakeholders (within government and from universities, civil society and companies), and to manage conflicting interests and expectations; mastery of systems thinking and of formative evaluation tools. Training is provided for building this capacity in collaboration with research centres and universities. The

Catalan Government is associated partner of the Transformative Innovation Policy Consortium and has a long-term collaboration with the research Centre INGENIO.

## 2. Dalarna

## Short characterization of the region

Dalarna is a sparsely populated region in central Sweden. Dalarna's economy depends on manufacturing industries such as forestry, paper production, steel manufacturing and iron mining, making the province one of Sweden's biggest exporters, though in many cases the industrial companies are subcontracted by others. The limited levels of regional R&D are explained because the region does not have a university and all head offices is situated outside of Dalarna.

## Problem-discovery

Dalarna defines what needs to be discovered as "joint goals" or "common goals and strategies for how to get there" i.e. objectives which are not for single actors but for sets of actors all together and "strategies for the groups translated into roadmaps". The discovery is about visions of the future. The region developed 5 visions leading to 5 different roadmaps. If actors want to be a part of the strategy they have to participate in the workshops and be the part of the roadmaps. Because Dalarna does not have a university but a university college, it is also about how to relate and build partnerships with universities in other regions when excellent research is needed. The role and competences of each stakeholder and the development of roadmaps also needs to be discussed. In the past, the region used to practice similar (discovery processes) which also involved listening to actors on field. However, it is clear that the ODP approach is different because it is associated to the formulation of "regional missions", which is different from what region was used to do in the past.

## System-discovery

Learning about the system comes in parallel with building these partnerships and knowing your own system or at least having an overview of what already exists. Hence, the discovery process involves discovering each other. This is not an easy process because there are too many actors, with layers of intermediaries with different functions, and there is a risk of losing trust (or at least of not gaining trust).

## Why is the region practicing ODP?

Dalarna justifies the need to use a different policy making approach because the previous triangle (triple-helix approach) was exhausted, therefore the region wanted to try a new approach that starts with complex challenges and directionalities and requires more collaboration. In Dalarna, there are many intermediaries such as for example, industrial parks, agencies and other specialised bodies that support sectoral value chains, e.g. construction, tourism, energy, etc. To make transformational changes towards societal challenges there is a need for higher collaboration between all these different layers of intermediary bodies and across sectors. This stronger collaboration is needed to define the vision, the goals and to enable participant stakeholders to find

their role in the system. In addition, open discovery is needed to enhance the possibilities for actors to participate in the diagnostic and in the design of proposals for solutions.

#### Who drives the process?

While any regional actor actors can "push their needs forward to initiate the process", at Dalarna the regional authority usually starts the process.

#### Engagement

At Dalarna openness and transparency are key issues for stakeholders engagement. Stakeholders meet every two weeks and it there is a sort of "FOMO - Fear of Missing Out" phenomena which pushes people to participate. While no particular "social technology" is used, the region claims it is important to "have fun". Most decisions are made by consensus, but when there are difficulties the regional authority decides by "consent".

#### Monitoring

Dalarna does not have yet a formal monitoring system to follow the implementation of the roadmaps. They are trying to work with the existing monitoring system which is broader and complement with qualitative monitoring. In the scope of the monitoring the regional authority promotes meetings with the platforms every month. In addition it maintains an on-going dialogue with municipalities to gather information on what is happening. Because it is a relatively small region it is rather easy to maintain proximity with key actors and listen to every suggestion or complaint.

#### Results and risks

With regards to milestones and intermediary results Dalarna is particularly concerned with the risk of losing trust. In addition, approach at the political level can be challenging, "As it is easy to go after the latest buzz, i. e. innovation valleys or similar, without really understanding the essence and the implication of the concepts".

#### Policy capacities

Implementation of ODP, according to Dalarna requires a particular mix of skills, such as:

courage, openness to learn and ability to learn by doing and by interacting. For a better implementation of the discovery process, Dalarna believes that before starting the process it would have been better to have had some training.

#### 3 Emilia Romana

Short characterization of the region

Emilia-Romagna is a region in northern Italy. It is an industrial region with a wide variety of sectors ranging from food processing, automotive design and manufacturing, packaging machinery, agricultural machinery, oil hydraulics and electro-medical equipment and ceramics. The economy is dominated by SMEs and a new S3 monitoring system just launched.

#### Problem-discovery

S3 related policies were developed in accordance with a labour and climate pact, which was established through collaboration with various stakeholders (local entities, associations, businesses, NGOs, and citizens) and served as the foundation for the ODP process. This approach enabled the region to address not only S3 initiatives, but also other pressing issues such as talent retention and flood management. ODP was utilized to address various challenges, including climate change, which has significant impacts on many sectors, namely agriculture. While the process was aligned with S3, it also encompassed other key regional activities.

#### System-discovery

The ODP process is employed to identify opportunities in sectors that are not traditionally part of the region's economic system, and to assess whether the region's development is on the right track or if there are important elements that may have been overlooked. ODP was also utilized to review and enhance the management of calls and activities. For instance, ODP was instrumental in uncovering previously unknown opportunities in the aerospace sector. A similar approach was applied to social innovation, involving a diverse range of stakeholders to validate assumptions and identify any potential gaps.

## Why is the region practicing ODP?

The Emilia Romagna region has a longstanding tradition of developing strategies in a participatory manner, actively involving stakeholders in the formulation of objectives. For over three decades, policies related to economic and regional development have been collaboratively developed with key stakeholders, including local administrations, businesses, associations, and research organizations. There has been a progressive shift in the approach to economic development, with an increasing number of economic actors being invited to participate in the process.

When the region began its S3 initiatives, the objectives expanded beyond S3 and encompassed a wider range of participants: "there was another way to think and another way to develop and economic policies" and "a new way of involving all the region in the broader sense". Emilia Romagna is employing ODP to address significant challenges, with the most prominent being climate change, whose effects are already apparent. The region, renowned for its agrifood sector, anticipates the impact of climate change on this industry and is willing to engage all stakeholders for discussions on this matter.

Defining ODP is a complex task. With the evolution of S3, a new approach was necessary, one that involved stakeholders right from the outset within the framework of the Pact for Labour and

Climate. The regional clusters (that goes under the name of "Clust-ER"), which represent various economic sectors, were deeply involved in collaboration with Emilia Romagna to identify challenges, strengths, and pathways. This approach was more dynamic, inclusive, and participatory. The governance model was updated to include a dedicated level for stakeholder participation, in addition to political, operational, and technical levels. All stakeholders will once again be engaged in the mid-term evaluation of S3 through specific "S3 forums" for each cluster, providing an overview with the goal of enhancing the strategy.

The process differed from the past in that there was an increased awareness and involvement of additional stakeholder groups, necessitating a different approach to managing the process and the team. The region utilized various focus groups associated with different sectors to provide input for the process, while also making efforts to engage and involve citizens by directly asking about the challenges they face.

## Who drives the process?

The regional joint consortium ART-ER - Attractiveness Research Territory provided the definition of S3, after which stakeholders were invited to contribute. The regional authority initiated and plays a central role in facilitating the process. ART-ER coordinates the regional innovation ecosystem including the Emilia-Romagna High Technology Network, the Technopoles, the business Incubators, the Clust-ERs and start-ups and also operates the local S3 domains

## Engagement

Citizen involvement was facilitated through the Pact for Labour and Climate as a starting point, utilizing various focus groups associated with different sectors to inform the process and seeking to engage citizens by soliciting their input on the challenges they face. Looking ahead to the evolution from S3 to S4, Emilia Romagna aims to actively involve civil society. The initial draft of S3 was made available online for general society to provide feedback, and some suggestions were incorporated into the final version of the strategy.

The region has a stakeholder plan, which is a dynamic document outlining activities to engage stakeholders. Those contacted respond and demonstrate interest in participating. While some individuals display more interest to participate than others, this might be attributed to personal attitudes.

Emilia Romagna region does not have big corporations or multinationals that might seek to dominate the ODP, with the majority of stakeholders being SMEs. The region's clusters, connected to the S3 strategy, consist of universities, research centers, enterprises, training facilities, and other actors. Collaborating with these entities enables the inclusion of various dimensions of actors without exclusion.

While those working with ERDF understand what S3 is, it is challenging to explain it to citizens. Discussions took place in focus groups, aiming to reach a consensus. A preliminary draft of the strategy was published online, allowing for input from stakeholders and citizens, which was later discussed with other departments and received feedback from the political system. The unit consistently led the process, involving other stakeholders at various stages. Ultimately, the regional

authority must lead the process to ensure that activities are feasible from both an economic and political standpoint.

## Monitoring

The region monitors the implementation of the participatory governance model. The forthcoming mid-term report on S3 implementation will also evaluate the success of the ODP and offer recommendations for improvement. The process's success is evaluated through participation, with stakeholders reflecting on their experience. The region has established a dedicated S3 committee to share and deliberate on the outcomes of S3 implementation and collectively determine how to enhance progress in the coming years.

#### Results and risks

ODP will be used for the mid-term evaluation, but it is currently too early to observe the results. The initial ODP process yielded thematic areas, revealing aerospace as a sector with significant potential. Various cross-cutting sectors were identified as crucial for this field, providing insights into how to effectively engage in this area.

Generally, the process takes a lot of time, especially in maintaining the relationship, one has to stay informed and be careful. The process is not a bureaucratic activity – it's a process of creating connections and keeping the connections alive. For this the regional authorities has to professional people with competences.

Receiving back responses from businesses or organizations for the surveys proved challenging, as they indicated lack of time or insufficient/different competencies. Engaging the civil society has also posed difficulties, with the role of ART-ER being crucial in this effort. Additionally, the clusters have played a significant role in reaching a diverse range of actors.

## Policy capacities

Establishing connections with other directorates was crucial in viewing the strategy not just as a tool for ERDF, but for the entire region. Flexibility is essential in determining how to integrate ODP into ongoing activities. Crucial capacities are openness to input and cooperation. Organization of the process was difficult because of typical vertically organized bureaucracy structures. It is important to understand other teams (within public sector).

## **4 Northern Netherlands Alliance**

#### Short characterization of the region

The Northern Netherlands Alliance (NNA) is a partnership between 3 provinces the North of the Netherlands. The alliance is a legal entity, but it doesn't represent a layer of government as there is no regional level in the Netherlands (only national, provincial en municipal). Since 2000, NNA became the managing authority for ERDF funds for each of the 3 provinces, and therefore the alliance has a responsibility for the design and implementation of Smart Specialisation Strategies.

The NNA has also public affairs activities in The Hague and Brussels and it has its own staff who answers to a board with members from each of the provincial individual boards.

#### Problem-discovery

NNA wants to discover new opportunities for specialization where they believe to have competences. However they see this as a long term process of "transition" or "transformation". Discovery or identification of new opportunities for NNA is not just about the development of new specializations. It is also about which economic activities have higher potential to contribute to a broader concept of prosperity i.e. opportunities to improve well-being. Hence, it is not an "opportunities discovery" process centred on economics and competitiveness at the expense of something else. It includes concerns with raising the standards of living beyond a strictly economic view. It is a discovery about the directions of development towards well-being.

Attempting not to exclude no any actor, the process starts with broad directions for specialization and then it progresses by narrowing them down to territorial realities. The NNA region acknowledges that these territorial specialisations "will take years, not just one programming period, maybe four or five" to accomplish. For example, "Circular economy which considered an opportunity for specialization was narrowed to circular plastics and to specific goals for place-based collaborations between green chemistry companies, universities and government. These more specific goals envision to find specific specialisation niches where the region might make a difference compared to other regions in Europe.

To summarise, NNA sees ODP as a policy process related to broader societal objectives and addressing systemic issues i.e. social and ecological issues, which according to NNA implies a need to have a "more inclusive process and a more effective interaction between stakeholders".

#### System-discovery

However, narrowing down broad societal objectives also requires the involvement of relevant actors at the sectoral level.

#### Why is the region practicing ODP?

The Northern Netherlands Alliance sees discovery of opportunities to improve specialization and well-being as a complex process. It is clear for the regional alliance that to develop these new specializations, something more was needed i.e. previous EDP practices would have to evolve. "Discovery of new opportunities and new directions needed to take into account the political sentiment that arises from putting societal questions or challenges at the center". While broad goals like the SGDs are not contested, at the specific place-based level, there are many challenges and problems that regions need to discuss. In addition "it is difficult to imagine that all stakeholders would be so clever to have all the information needed to make informed decisions", which also justifies the need for a collective discovery process.

Nevertheless, the regional alliance does not see ODP as being much different, relative to what they have done in the past with EDP. They have always had a practical approach of experimenting and correcting things that do not work. "What was needed was to include sustainability and societal challenges which implies a need to open up the process more than it used to".

#### Who drives the process?

The NNA governance bodies such as the Higher Quadruple Helix Committee are strongly committed the EU Green and Digital transitions. These government bodies take the responsibility in terms of formulating the local specialization strategy. The NNA S3 strategy is designed around three pillars and it is strongly connected to the ERDF funding program through the so called "conditionalities".

While in some cases the discovery process may be already taking place in the region, initiated by particular actors, these initiatives often stay small and don't develop i.e. do not get support from the high level governing bodies and do not link to other stakeholders who might be interested to join.

This may be because, the top level bodies do not focus of on the importance of systems level change, or at least does not maintain this much needed focus over longer time frames, as would be required. Especially for politicians at the top level it's difficult to take a long term perspective and put their weight behind a much needed system-level change. "Understandably, politicians generally appear to be more concerned with flagship initiatives delivering quick results than they are with system transitions that take too long to be accomplished".

#### Engagement

For calling and engaging the actors no specific methods are used. "Everything is very informal, but there is purpose is not just to meet".

#### Monitoring

With regards monitoring initiatives and efforts the region points out that the innovation monitoring activities are important but present some limitations, namely they do not show changes in the behaviour of SMEs nor do they include metrics focused on prosperity and well-being.

#### Results and risks

The Northern Netherlands Alliance believes the strategy is well understood. The essence of these concepts are well taken. However, there's not much to be seen yet in terms of tangible results. What can be seen is that more and more people and organizations are adopting the same narrative about the need for more transformative strategies, and the need for more alignment and interactions between stakeholders. In addition there are positive changes on information sharing and on the extent of regional collaboration and new coalitions.

#### **Policy capacities**

The policy capacities referred by NNA is the ability to look at things from a broader perspective, the ability to combine different perspectives, and to be creative. Those kind of competences are important not just in public administration but also in all other actors involved into the transitions' processes towards specialization.

## 5 Västerbotten

#### Short characterization of the region

Västerbotten is a rural, sparsely populated Arctic region in the north of Sweden. The region is rich in natural resources such as mining, forestry, water and energy. The new green industrial investment have become increasingly important such as sustainable energy (biomass, bioenergy, hydrogen, batteries etc.). Västerbotten is part of the Sápmi region, where Europe's only indigenous people – Sámi – live.

#### Problem-discovery

Västerbotten's recent S3 update is committed to improving transparency and linkages between long-term "common goals" and intermediary milestones to meet the new challenges with the green/digital transition and to be able to transform to a green, smart and attractive region. Furthermore, the region's strong place-based approach is also strongly connected to wider SDG 2030 challenges. This is consistent with the Regional Development approach of all Swedish regions. The region has learned from stakeholder engagement that if common goals are too broad, such as the EU missions, it will be difficult to engage regional actors especially companies. However, if they are too narrowly defined, this confines the scope for wider innovation ecosystem engagement. These "common goals" combine the region's economic diversity with the conditions that promote citizen well-being. This requires a holistic approach to promoting the region's attractiveness, especially due to the large investments in green industry – to both current and new residents – by providing quality-housing options and promoting labour market opportunities, not least in areas that combine traditional skills with more technology-related developments. Overall, Västerbotten sees the Open Discovery Process as a long-term, challenge-oriented approach to engaging stakeholders in defining challenges and opportunities that require solutions through the efforts of the quadruple helix innovation ecosystem.

## System-discovery

But "common goals" need to be linked to who is doing what. Hence, "discovery" is not just about finding and prioritising goals and milestones, but also about how to build platforms for people to connect and discuss i.e. it is a discovery of broadening the "net" of engagement across different actors and agreeing on "common goals".

## Why is the region practising ODP?

In Västerbotten collaborative processes have been the tradition in the region for a long time. All actors agree that there is a need to discuss what kind of society the region wants for itself. New "green" or "clean" investments have consequences in terms of new roads, new houses, investment prioritisation etc. This also entails trade-offs for example due to fiscal constraints in what can be prioritised for action and the potential impacts of new infrastructures. Change and disruption require very careful and sensitive management if long-term community support is to be sustained. ODP is justified because it enables a collective reflection not just about "efficient" use of resources or how to counteract the decline of young people in the rural areas, but essentially a reflection

around how to "combine new economic diversification possibilities while maintaining or enhancing healthy socio-economic ways of living". ODP is also justified because of the need for ongoing reflection. The process cannot be driven only by "dominant players" who can exert undue influence. For instance, various industries may have distinct economic, social and environmental objectives, leading to collaboration obstacles. In the case of the mining and tourism sectors, the ODP approach could facilitate the identification of innovative opportunities and the reconciliation of their differences in order to accelerate the adoption of green and digital practices. There is a need to bring ecosystem actors together – in more systemic constellations – to generate joint solutions that take account of the region's history and geographical characteristics, such as involving the indigenous people better and discussing related issues better.

Overall, ODP is justified because of a need to instil a permanent dialogue that facilitates multi-actor connections - tackling complex issues related to "attracting investments that generate employment while at the same time enhancing social and ecological conditions of living in the region, seeking to enhance attractiveness while promoting a reality-check on managing trade-offs

## Who drives the process?

Generally, the Västerbotten regional authority initiates the process. Regional authorities need to manage the ecosystems in the regions and to facilitate the meeting place as well as facilitating enthusiasm and collective understanding for the ODP as a development tool for Västerbottens Smart Specialisation. Västerbotten needs to further build the bottom-up process with the ODP in the region but already now they can see early developments, for example the "Nordic batteries belt initiative" became a self-managed discovery process Another example is the "Viable Cities" initiative.

#### Engagement

As for a sparsely populated region, engaging known actors is relatively uncomplicated, due to preexiting knowledge and engagement. However, in a small community new actors may experience difficulties in tapping into informal networks and being included in a more systemic way. By working closely with our innovation incubators, Västerbotten is trying to fill that gap.

#### Openness of the process

To keep the process dynamic and open, Västerbotten uses interactive workshops instead of traditional meetings, online platforms, roundtable discussions with politicians and other engagement methods. In these workshops, engagement techniques ensure that all actors are encouraged to actively participate. Any actor can also use written messages (if there is a need to remain anonymous) to make their voice heard.

#### Legitimacy

The region is sensitive to the dynamics that favour incumbents and their potential influence on smaller and less known actors (because the small SMEs are interested to work with the large dominant actors). Therefore there is a strong market-driven and organic supply-chain orientation to

how innovation actors connect The regional authority can help by playing a facilitation and coordination role, not least in guiding innovation actors to EU priorities that can open doors for enhanced EU collaboration. This is a work-in-progress, as there is a high degree of policy change at the EU level (e.g. related to State Aid and improving the EU's security of supply in strategic sectors and value chains). It is not easy for EU regions to keep pace with these changes, in order to define place-based opportunities and challenges.

#### Monitoring

Västerbotten gathers information and data for the regional innovation development from both the national and the regional levels twice every year. This is complemented with interviews to follow up the strategy roadmap. The region is looking for a new ways to define what is happening on the ground, using new (and more granular data) to inform policy and investment decisions. In particular, the region is building its own model of "innovation preparedness". The new system is named "metric" and it uses different data sources including local information directly drawn from sources from the regional ecosystems.

## Results and risks

Västerbotten value the views and strengths of their incumbent actors. The S3 aim to encourage them to champion the change processes that they face by encouraging new and less prominent actors to share insights that can support the diversification and upgrade their innovation priorities, especially where these are aligned to SDGs / EU Green Deal ambitions. This requires an open cocreation process that is based on trust and that creates ownership of the issues among the majority of actors, otherwise there is a risk of not being able to meet the new challenges of the green transformation that requires collaboration across all sectors. Also, it sees risks related to governance where actors and public sector organisations/departments fail to share information due to established patterns of working in silos and through more hierarchical forms of decision making. This can prevent effective collaboration, creating a level of resistance to change. Monitoring and revisions of the roadmaps are also a great challenge. In addition the region reports that funding rates of only 40%, (a change from previous program period where it was 50%) can make it more difficult for less financially strong actors to find co-financing, especially for the rural areas that are sparsely populated and risk therefore to discouraging higher levels of stakeholder engagement. This creates challenges for the long-term planning and delivery of regional development and innovation, where an attractive and predictable investment environment is necessary.

## Policy capacities

Finally, region Västerbotten acknowledges the need to develop new administrative policy capacity to deal with the vastly changing environment that requires new processes. Overall, the region perceives a need to have an "open mind", "engagement capacity", "know who to talk to as well as listening", and in particular, capacity to reach those who are in a position to take decisions at national and EU level as well as the value of interregional collaboration.

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