



INNOVATION

Open, Social, and Responsible

A Policy Brief from the Policy Learning Platform on Research and innovation

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**Interreg
Europe**



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Summary

This policy brief explores the importance of open, social, and responsible innovation to promote transformative changes. The rising societal grand challenges require transformative changes beyond research and innovation to also include institutional, social, and organisational changes towards inclusiveness and sustainability. Open, social, and responsible innovation participate to this policy shift. Transformative change policies imply greater regional policy experimentations making Interreg Europe projects the ideal space for policy learning. This policy brief features five policy recommendations using the experience of Interreg Europe projects to inspire policymakers to better design and deliver open, social, and responsible innovation policies.

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Foreword

Johan Schot, Professor Global History and Sustainability Transitions, Utrecht University

Within the European Union and many national contexts, science, technology and innovation (STI) policies are called upon to make ecological and social challenges their central goal. Since World War II, STI policy developed along three main paradigm shifts [1]: during the first decades after the war, Investment in R&D was mainly focused on overcoming market failures, the assumption was that more R&D translates in more innovation; [2] However, in the 1970s/1980s academics and policy makers realised that this is not a linear process. The fact of acknowledging that some countries and regions were more successful than others in innovating, led to a new perspective that focused on improving national innovation systems and entrepreneurship as mechanisms for exploiting knowledge production; [3] Finally, in the past decade, the idea of “challenge-led innovation” emerged, focused at addressing social and ecological challenges. Three strands of innovation research and policy currently contribute to this idea. The first one is **Mission-Oriented Innovation Policy (MOIP)**, a top-down government led process that aim at addressing societal challenges by defining bold targets (“missions”) to be achieved by research and innovation efforts. The second is **Responsible Research and Innovation (RRI)** a governance approach to scientific and technological development that focuses on anticipation of and learning about societal challenges early on in the knowledge production process through a participatory process. The third one is **Transformative Innovation Policy (TIP)** that focuses on realising sustainability transitions through large scale experimentation, nurturing and scaling of transformative innovations. The focus is not on product innovation, but on socio-technical system change, which covers - next to technological change- also change of cultural perceptions, user needs, industrial strategies and business models as well as change of policy and governance. **Social innovation is as important as technological innovation.** In fact, both are connected. Experiments with implementing frame 3 policies are underway, with some promising results. A next step is a better integration of MOIP, TIP and RRI policies by developing the concept of **transformative mission-oriented innovation policies with a strong focus on participatory anticipation and learning.**



1. Introduction

The importance of open, social, and responsible innovation for research and innovation

Research and innovation are driving productivity growth, regional economic competitiveness, and thus economic development. It is widely recognised that they do not only have economic impact but also social impact. Research and innovation are associated with the process of “creative destruction” that can lead to **social instabilities** (unemployment, poverty, inequalities, social exclusion) considering the rising of **societal grand challenges** (COVID-19 pandemic, digital transformation, climate change, energy efficiency, biodiversity loss, ageing population, and pollution). As a result, modern economic growth must go together with societal progress. Open, social, and responsible innovation offers a policy pathway to reconcile these two forces, bringing economic growth and transformative changes at the same time.

The rise of societal grand challenges require transformative changes beyond research and innovation to also include institutional, social, and organisational changes towards inclusiveness and sustainability ([Uyarra et al.](#)). Innovation policies have thus evolved from linear models focused on economic growth in the 1960s, to national innovation systems for competitiveness in the 1990s, to the most recent approaches oriented to transformative changes (see Figure 1 and 2; [Schot and Steinmueller](#)). Also spearheaded by the UN Agenda 2030 and the Sustainable Development Goals (SDGs), innovation must not blindly follow competitiveness logic but must respond to broader regional and societal challenges and be an ‘intermediate step towards the longer-term goals of fostering sustainability and inclusiveness’ ([McCann and Soete](#)).

This shift towards transformative changes provides policymakers novel policy challenges as they not only have to question the how and how much innovation but also key issues of **directionality, legitimacy, and responsibility** ([Schlaile et al.](#)). In other words, innovation requires policymakers to address not just how to get there (which policies) but also fundamental issues of directionality (what future do we want), legitimacy (why do we want this future, who defines it), and responsibility (transformation by and for whom). Societal grand challenges, such as climate change or the COVID-19 pandemic, require tailored, complex solutions, which cannot only be limited to technological, or market-oriented domains. The regional policy focus must thus shift to address problems of economic restructuring and territorial disparities. European regions can take advantage of the top-down directionality initiatives to experiment with innovation policies ways to tackle regional societal challenges.

Transformative innovation is characterised by socio-technical, systemic, transition-oriented, experimental, “glocal”, transdisciplinary and participatory aspects ([Daimer, Hufnagl, and Warnke](#)). Transformative innovation policies imply that regional policymakers must experiment with policies to stimulate **socio-technical transitions** and new institutional solutions for changing the directionality of existing R&D and innovation activities ([TIPC](#)). They are **systemic** and experimental, generating feedback loops between invention, innovation and use, and ongoing interactions between actors, networks, institutions, and technologies. Transformative change policies involve **experimentation** across a broad front or over a wide variety of contexts and directionality ([TIPC](#)).



	Frame 1 - R&D	Frame 2 - Innovation Systems and entrepreneurship ecosystems	Frame 3 - Transformative change
Time of dominance	1960s-1980s	1980s to today	Emerging
Main geographical focus	National	National and regional systems of innovation intersecting with sectoral and technological innovation systems	Multi-scalar: focus on grand challenges that extend to multiple scales exceeding geographical, sectoral, technological and disciplinary boundaries
Focal actors	Government, scientists and industry actors	Interlinked configurations of government, science and industry actors with particular attention to the role and missions of universities	Government, science, industry, civil society, end-users and non-users
Justification for policy intervention	Fixing market failures	Fixing structural system failures	Fixing transformational system failures
Main strategy	Knowledge generation	Knowledge utilisation	Solving social and environmental challenges
Nature of critical knowledge	Appropriate and transferable	Sticky and situated	Emergent and co-produced
Focal areas	High technology	Radical and incremental product and process innovations	Socio-technical systems: stress on fundamental transformation of system architecture, changing both its components and its directionality of development

Figure 1. Three Frames: A Comparison (overview). Source: [TIPC](#).

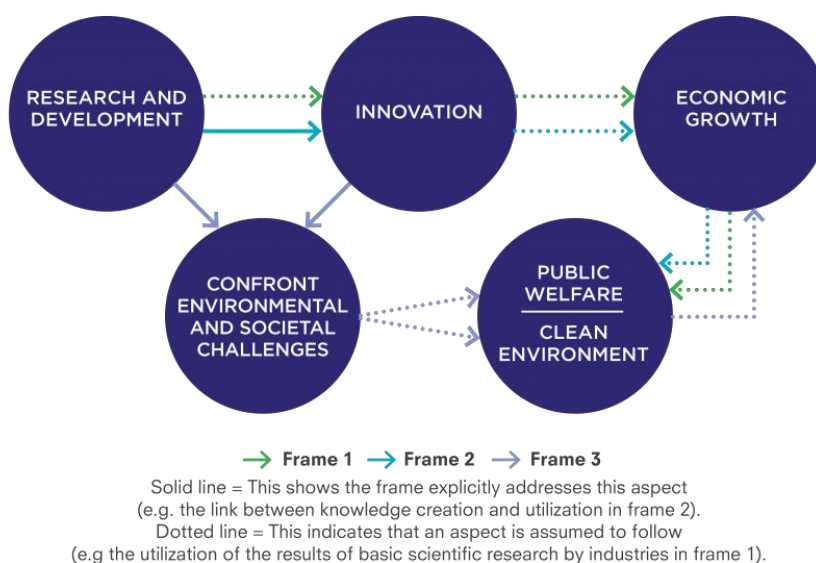


Figure 2. Three frames of innovation and their directions. Source: [TIPC](#).



Box 1. The Policy Learning Platform thematic workshops

The Interreg Europe Policy Learning Platform organised a **thematic workshop** on [Open, Social, and Responsible Innovation](#) held in Brussels on 27 November 2019. **Riina Pulkkinen**, Finnish innovation fund SITRA, presented [Reshaping the Innovation Process through Social Innovation](#). **Wim De Kinderen** presented the role of [The European Network of Living Labs \(ENoLL\)](#) for open innovation. **Alexander Gerber** presented the role of [Responsible Research and Innovation \(RRI\)](#) for policymaking.

The Interreg Europe Policy Learning Platform organised an **online thematic workshop** on [Innovation for Societal Grand Challenges](#) on 8 September 2021. **Elvira Uyarra**, Professor at the University of Manchester, discussed [the role of transformative innovation policies and mission-oriented innovation policies to address societal challenges](#). She stresses that regional policymakers have an important role to play as societal challenges are not only global but also local and regional. Societal challenges can be drivers for better innovation and help give a direction to regional innovation strategies, support aligning actors around a common vision, increase potential for radical innovation and structural change. This will enable regions to become lead markets for innovative solutions to societal challenges.

Box 2. How can the Policy Learning Platform support?

The [Interreg Europe Policy Learning Platform](#) can help regional policymakers to better design and implement open, social, and responsible policies by facilitating the exchange of experience from different institutional contexts and showcasing success stories via the [Good practice database](#). The [Policy Learning Platform](#) can provide a forum for direct discussions among partners from different projects – either in thematic workshops, [matchmaking sessions](#), peer reviews, or in webinars and online discussions, and provide expert advice through our on-demand [policy helpdesk service](#).



2. Open Innovation

Foreword - Clive Peckham, Nièvre Numérique, France

The European Commission is increasingly pushing for transformative changes, i.e. ‘change drastically how we do things at the level of individuals and organisations to make our society more sustainable’ and adopt ‘an integrated and whole-of-society approach’.

‘Drastic changes’ are deep and significant and can be initiated through top-down initiatives. However, an integrated and inclusive approach requires an open-mindedness in the ideation and design process with the participation and input of relevant stakeholders to create both, a shared path, and a common responsibility for delivering the processes that will lead to change.

Open innovation in ‘transformative’ product or service design is stakeholder centric. First, we need to identify the relevant groups who will be impacted by changes and provide appropriate support to them to understand the potential and scope of the service and define their priorities for goals and outputs. Open innovative service design processes are inclusive environments where all stakeholders can contribute and participate in the interactions which lead to the design and operation of the services and actions in question. They allow each stakeholder to understand and measure the value of their own input and of the outputs they wish to achieve as well as to understand collectively what the impact will be on the relationships between stakeholders and on the ‘eco-system’ the policy is intended to transform.

Within the ERUDITE SEROI+ process, we are bringing together an open and inclusive design process with stakeholder led social and economic return on investment forecasting to predict the global and often unaccounted value that services can bring (and subsequently redesign them if necessary). If we want to create our smart and resilient territories of the future then we must collectively establish priorities and then design the transformative mechanisms and solutions that will add the most economic, social and environmental value for the people and for the places they are intended to transform.

The concept of open innovation

The concept of **open innovation** is a paradigm that acknowledges the importance of inflows and outflows of ideas and tacit knowledge in the process of innovation ([Chesbrough, Vanhaverbeke, and West](#)). **Open innovation** highlights the importance of **external ideas and paths to markets** to accelerate the development of technologies and innovations. Indeed, innovative actors cannot solely rely on their own internal resources to innovate but should also **explore a wide range of innovative opportunities** and exploit them through multiple channels. Companies and innovative actors should not just rely on internally developed ideas and knowledge, but increasingly also on ideas and knowledge developed externally. They should create external paths for ideas to go to market in addition to the internal path for innovation. Innovative actors can adopt mechanisms to source and acquire external knowledge such as the absorption of local knowledge spillovers, collaboration in R&D and innovation with firms and universities, the use of living labs, relations to spin-off companies, informal knowledge interactions, and open innovation campus models ([Tödtling et al.](#)).

Open innovation depends on certain innovation actors’ characteristics and the **regional innovation culture** made of trust, openness and cooperation based on informal relationships. The role of innovation networks is critical for the process of open innovation and for innovation actors to access and acquire external knowledge. **Innovation networks** are ‘usually formal collaboration of partners aiming at increasing their competences and innovativeness and to generate innovations’ ([Cunningham and Ramlogan](#)). **Innovation networks** accelerate the innovation process by promoting interactions, the acquisition, diffusion, and exploitation of knowledge, the learning processes, the reconfiguration of relationships—such as with suppliers or with producers of knowledge—and the collaboration on a diverse range of issues including training, technological development, product design, marketing,



exporting, and distribution ([OECD](#)). **Innovation Networks** are not only tools for knowledge transfer but also have **an important social function** to build-up common social capital and trust among network partners.

The presence of innovation networks facilitates the process of open innovation. Innovation networks improve firms' search space and limit both **bounded rationality and bounded vision**. [Antonelli](#) points out that innovative actors can acquire four types of knowledge inputs, namely internal and external, tacit and codified knowledge to generate new technological knowledge. **Innovation networks** have an important role for members to identify, acquire and exploit the most relevant **external knowledge**, which when recombined with internal knowledge, is a source of knowledge creation. **Innovation networks** are thus platforms for exchanges among partners of regional and extra-regional tacit and codified knowledge thus conducive to the process of open innovation. There are many innovation networks in the European Union to support regional policymakers and regional innovation stakeholders dealing with research and innovation policies (read our policy brief on [Innovation Networks](#) for the list of innovation networks).

Regional policymakers are creating **open innovation platforms (OIPs)** to harness and diffuse regional knowledge and ideas with the double objective of promoting inclusive and transparent policymaking while strengthening innovation (see Box 3). OIPs are built around the **quadruple helix open innovation model**, where “government, industry, academia and civil participants work together to co-create the future and drive structural changes far beyond the scope of what any one organisation or person could do alone” ([European Commission](#)). OIPs provide **agile co-creation spaces** facilitating interactions among research, education and innovation through innovative tools in a bottom-up process to involve users or citizens in the production of services ([Raunio, Räsänen, and Kautonen, 2016](#)).

Interreg Europe projects

The concept of open innovation provides a policy pathway to transformative changes as it aims to engage end-users and quadruple-helix stakeholders in co-creation processes to develop new products, services, processes, and practices as well as to generate new knowledge. Regional policymakers have experimented policy approaches to bring and connect different stakeholders together through platforms, formal and informal networks, and physical spaces to promote face-to-face interactions while having evidence-based methodologies that facilitate the process. Interreg Europe projects such as [ERUDITE](#) and [OSIRIS](#) are dedicated to developing and delivering better policies regarding open innovation. [ERUDITE](#) promotes the diffusion and exploitation of digitalisation opportunities for regional development. [OSIRIS](#) supports innovation actors to respond to regional societal challenges through open social innovation methods to stimulate a bottom-up co-creation process for regional development.

European initiatives

The [Pillar III, Innovative Europe, of Horizon Europe](#), the research and innovation funding programme for 2021-2027, emphasises the role of open innovation through three programmes, namely, the [European Innovation Council \(EIC\)](#), [European Innovation Ecosystems \(EIE\)](#) and the [European Institute of Innovation and Technology \(EIT\)](#). Pillar III, Innovative Europe, aims to reinforce close cross-border collaboration between multiple actors, including academia, the public sector, industry and individual entrepreneurs while supporting the development of disruptive and market-creating innovations and on enhancing European innovation ecosystems.

The [European Innovation Council \(EIC\)](#) aims to identify and support breakthrough technologies and game changing innovations to create new markets and scale up internationally. The [European Institute of Innovation and Technology \(EIT\)](#) brings together leading business, education, and research organisations to form dynamic cross-border partnerships and Innovation Communities to find solutions to specific societal challenges. Regional policymakers will have an important role to play to foster open innovation ecosystems among national, regional and local innovation actors through [European Innovation Ecosystems \(EIE\)](#) that will contribute to all 4 key strategic orientations of the [Horizon Europe strategic plan](#), namely:



- To build interconnected, inclusive innovation ecosystems across Europe by drawing on the existing strengths of national, regional, and local ecosystems and respond to societal challenges for the benefit of society, including the green, digital, and social transitions.
- To reinforce network connectivity within and between innovation ecosystems to accelerate sustainable business growth with high societal value.
- To support the European Partnership for Innovative SMEs (Eurostars 3).
- To complement the European Regional Development Fund (ERDF) support for innovation ecosystems and interregional partnerships around smart specialisation topics.

Box 3. The role of open innovation platforms

The Policy Learning Platform published an article on [open innovation platforms \(OIPs\)](#) and their importance to promote open innovation ecosystems. The article features two good practices, namely [Tampere Region OIPs](#) in Finland and [OIPs](#) in Lombardy region in Italy.

In [TITTAN](#), the [OIP](#) was launched by Lombardy Region in 2015. It provides innovative tools and methodologies and is coordinated by facilitators to support interactions and co-creation on innovation topics among quadruple helix stakeholders. The OIP drives regional structural changes by continuously improving the smart specialisation strategy (S3) through supporting the launch, implementation, and communication of research and innovation projects.

In [MARIE](#), the [Tampere Region OIPs](#) is a programme to support the creation of platforms to foster an open and inclusive culture of innovation. It funds platforms that encourage co-creation through a bottom-up process among different actors—companies-students, companies-universities, and triple helix stakeholders. The [OECD](#) has selected the case of [Tampere Region OIPs](#) to illustrate that open innovation platforms aim “to engage a much broader knowledge base for innovation activities while offering the “city as a living lab” and user-oriented open innovation services for the use of firms and other actors (clients)”. As an example of a platform promoted in [Tampere Region OIPs](#), [Demola connects leading companies and students through innovation challenges](#), and it has contributed to the creation of 135 new jobs, connecting 180 companies and more than 500 people involved in projects.



2. Social Innovation

Foreword - Luciano Galetti, the Autonomous Province of Trento, Italy

The active involvement of local stakeholders and citizens is key for sustainable policy development and for the transition towards the social innovation paradigm. In other words, innovation with social objectives activated by social operators. Public actors must apply guidelines, collaborate, and directly involve local stakeholders through bottom-up processes to design policies with great impact to respond to social challenges. Legitimacy of solutions must be achieved through bottom-up co-creation with all local stakeholders. To do that, decision-makers, who understand communities' needs, must be identified.

Within the **DIALOG** project a model of participatory processes and methods was drafted to ensure interaction, co-creation, and open social discussion among local stakeholders in the development of social innovation policies. The model follows five participation levels and methods, namely, to inform-participate-involve-collaborate-empower. The participatory model offers a strategic frame that can be adapted to the different contexts and situations.

Another important aspect is to find the right balance between the role of regional policymakers and the broader participatory process involving regional stakeholders to overcome possible resistance to changes. Provided effective institutional learning, **DIALOG** highlights that social innovation can successfully introduce policy changes. It requires mutual understanding, legitimacy, responsibility and specific methodologies and tools to support co-creation and participatory processes to properly respond to local social challenges.

The concept of social innovation

Social innovations are 'innovative responses to unsolved social problems and needs, which have not been successfully tackled by the State or the market. Social innovation is needed because many social challenges are resistant to conventional approaches. They require novel approaches, inventive actors and new forms of co-operation among them, thus bringing together different kinds of expertise, skills and tangible and intangible assets. **Social innovation's major aim is therefore to tackle complex social challenges by providing innovative solutions'** ([OECD](#)).

There are different definitions of social innovation. They usually include social objectives, social interaction between actors or actor diversity, social outputs, and innovativeness. Social innovations are new ideas that meet social needs, create social relationships, and form new collaborations. These innovations can be products, services or models addressing unmet needs more effectively. Social innovations are innovations that are social in both their ends and their means. They are not only good for society but also enhance individuals' capacity to act ([European Commission](#)). They bring together user-driven innovation methods and include civil society actors in their delivery, but limit their application to issues that are of societal importance ([European Commission](#)).

Technological changes and the shift towards the digital and green twin transitions imply socio-economic transformations that must be accompanied to reduce social instabilities. As a result, social innovation is increasingly operationalised in policy settings to respond to pressing societal challenges as places, people, and firms need to be more resilient, adaptable, and innovative. Social traits and social capital can hinder or enable transformative changes. Social traits, such as technological conservatism, tradition, custom, routine, can produce economic inertia, conformism, and thus be powerful obstacles to innovation and technological change. Social capital can rally regional actors to act as it encompasses the norms, values, and beliefs, which are shared in everyday interaction within social networks, and which enable the coordination of action to achieve desired goals ([Maskell](#)).



Interreg Europe projects

For regional policymakers, social innovation implies reaching to all society groups and identifying unmet social needs. Considering the shift towards transformative changes, it involves policy experimentation, establishing trust, and learning the right skills to engage all relevant stakeholders. Some Interreg Europe projects are already promoting the effective delivery of **social innovation policies to build more resilient regional innovation ecosystems**. **DIALOG** focuses on promoting citizen's engagement in defining research and innovation policies to foster social impact. **ECORIS3** focuses on policies and measures to support local and regional innovation ecosystems. **INNO4SPORTS** aims to promote socio-economic transformation and innovation in sports ecosystems. **PASSPARTOOL** aims to develop key tools to assess and improve soft innovation policies, namely related to social, organisational, institutional, and open innovation.

European initiatives

In the European Union, social innovation aims to respond to many social challenges and unmet societal demands. The European Commission promotes social innovation through **social entrepreneurship initiatives** and policies and funding initiatives such as: the **Innovation Union Initiative**, the **Social Business Initiative**, the Start-Up and Scale Up Initiative, Horizon Europe, and the **Employment and Social Innovation (EaSI) strand of European Social Fund Plus (ESF+)**. Each year, the **European Innovation Council (EIC)** organises the **European Social Innovation Competition** to support early-stage ideas and facilitate a network of radical innovators to address unmet social needs.

Box 4. Designing innovation ecosystems with social impact

The Policy Learning Platform published an article on **Torino Social Impact** and the role of local governments to deliver social innovation. The Metropolitan City of Turin, a dynamic industrial and innovation ecosystem, aims to the transition towards **an economy with social impact**. **Torino Social Impact**, a public-private initiative, was launched in November 2017 when quadruple helix stakeholders—companies, institutions, financial operators, charities, foundation and third sector enterprises—signed a **Memorandum of Understanding (MoU) to share ideas, experiences, projects and resources to promote social impact activities**.

Torino Social Impact has the mission to promote economic dynamism and social value at the same time. To do so, social impacts are based on three principles:

- **Intentionality** – To act with the aim of generating social value.
- **Additionality** – To operate in sectors that are excluded by market mechanisms.
- **Measurability** – To apply ex-ante evaluation methods and ex-post measurement tools.

Torino Social Impact, identified in the framework of the Interreg Europe project ECORIS3, illustrates the importance **to empower the private sector to contribute to social innovation impact initiatives**. In Turin, **the joint public-private leadership** is at the heart of the industrial and innovation ecosystem's transition into an entrepreneurial ecosystem with social impact. **Torino Social Impact** offers a path forward for regional policymakers and practitioners to promote initiatives stirring social innovation and impact within an existing entrepreneurial ecosystem.



3. Responsible innovation

Foreword - Giulia Bubbolini, CISE – Centre for Innovation and Economic Development, Italy

Transformative change seeks to address current social and environmental challenges, while increasing the resilience of our systems to present and future systemic crisis. Resilience hinges on the capacity to “futurise”: the ability to anticipate, but also to respond to what could not be entirely nor precisely foreseen. Resilience is about dynamically pursuing our shared European vision of sustainability, inclusion, and prosperity, through participation and democracy. Science-based evidence and evolutions in data analytics are improving our understanding of socio-economic and environmental phenomena. In parallel, the willingness and humility to review the narrative and the metrics of our core values and our paths towards them must be ensured.

At Interreg Europe **MARIE**, we believe this resonates strongly with the operational dimensions of Responsible Research and Innovation (RRI) - anticipation, inclusiveness and participation, responsiveness, and reflexivity.

Besides, RRI provides a framework for quadruple-helix co-creation of novel organisational and technological solutions. Through RRI processes, policymakers and businesses do not simply react to social and environmental challenges or crisis, they anticipate them and co-design (through active inclusion and participation), delivering research and innovation results that can prevent them. While keeping responsive to the unforeseeable events the future will unfold nevertheless, they dynamically co-transform our systems and economies towards the vision that is at the core of our common European strategic priorities, as they evolve through a reflexivity effort of constant monitoring and learning.

By connecting research and innovation to the pursuit of shared values and a common mission, to the improvement of the quality of life for present and future generations (or – at the very least – to the specific intent of avoiding adverse impact), RRI enables researchers and innovators to understand and find their role within transformative change. It provides them with citizenship in transformative economies.

The concept of responsible innovation

Responsible Research and Innovation (RRI) is defined as “a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)” (**Von Schomberg**). In other words, the aim of RRI policy is to create a societally beneficial impact of research and innovation. RRI is a ‘cross-cutting issue’ in Horizon 2020 and its strategic ‘Science with and for Society’ objective. In Horizon 2020, RRI became framed around five so-called ‘keys’: gender, open access, science communication, ethics, and public engagement (**Owen, von Schomberg, and Macnaghten**).

Research and innovation projects can include RRI indicators (see figure 3). In a report published by the European Commission on **Indicators for promoting and monitoring Responsible Research and Innovation**, these indicators are divided into three sections: (1) good governance as an overarching principle for R&I networks; (2) public engagement, gender equality, science education, open access and ethics, as the five main keys for governance; and (3) sustainability and social justice/inclusion as a more general policy goal.



Responsible Research & Innovation in European Partnerships	
Equality & non-discrimination	Promotion of equality and non-discrimination in all EU policy, acknowledging unconscious bias
Ethics	Guidelines on research integrity for responsible conduct of research
Inclusiveness and public engagement	Openness and transparency of partnerships & public engagement of citizen
IPR & GDPR	IPR rules and GDPR respected
Open Innovation	Open Innovation - as open as possible
Open Science	Openly available research outputs: Open access to Publications & Open Data
Responsible evaluation & decision making	DORA & responsible use of research metrics, no bias in evaluation
SDGs & EC priorities	Taking into consideration UN Sustainable Development Goals and European Commission priorities 2019-2024

Figure 3. RRI principles considered relevant for partnerships by [ERA-LEARN](#).

RRI emphasises the need for research and innovation to be anticipatory, ethical, reflexive, engaged (with publics and stakeholders), open and mutually responsive in terms of their agendas and trajectories. Anticipation refers to the possible consequences of research and innovation. Reflection implies for researchers to reflect on the research questions they ask and the implications of their findings. RRI is an approach that anticipates and assesses potential implications and societal expectations over its development. It implies that societal quadruple helix actors work together during the whole research and innovation process to better align both the process and its outcomes with the values, needs and expectations of society ([European Commission](#)).

RRI offers a pathway to frame innovation-related decision making and to design transformative innovation policies. It provides a frame to operationalise the Open Science agenda, to promote co-creation and citizen science, and to design better innovation policies that can be challenge-oriented and transformative ([Uyarra et al.](#)). For instance, **technology foresight** can be used as a policy tool to engage in RRI as it allows to anticipate and reflect in a participatory manner. Indeed, technology foresight can be seen as “a systematic exercise aimed at looking into the longer-term future of science, technology, and innovation in order to make better-informed policy decisions” ([Pietrobelli and Puppato](#)).

Interreg Europe projects

The Interreg Europe project [MARIE](#), MAInstreaming Responsible Innovation in European S3, provides interesting examples on ways to make the [RRI concept](#) a reality at the regional scale and to integrate it within the [Smart Specialisation Strategy \(S3\)](#). Due to the policy complexity of the two concepts, policymakers must have concrete tools and instruments for such integration, starting from the quadruple helix, open innovation, and information systems and tools for RRI application.

The concepts of [Responsible Research and Innovation \(RRI\)](#) and [Smart Specialisation Strategy \(S3\)](#) are central within the European Union innovation policy agenda. As innovation policies, both RRI and S3 share some similarities, arguing for a broad stakeholder involvement in the development of innovation policy and of innovations ([Fitjar, Benneworth, and Asheim, 2019](#)). While RRI aims to reconcile scientific progress with societal interests, S3 is a place-based policy strategy to promote innovations. If innovation outcomes should trickle down to the broader civil society, the two approaches must be combined to generate the kind of approach to innovation that can both drive growth and build better societies ([Fitjar, Benneworth, and Asheim, 2019](#)).



European initiatives

RRI is a ‘cross-cutting issue’ in Horizon 2020 and is included in [Horizon Europe as operational objective 2 \(c\)](#). In order to deepen “the relationship between science and society and maximising benefits of their interactions, the Programme should actively and systematically engage and involve citizens and civil society organisations in co-designing and co-creating responsible research and innovation agendas and contents, promoting science education, making scientific knowledge publicly accessible, and facilitating participation by citizens and civil society organisations in its activities”. The European Commission emphasises the importance of [public engagement](#) to co-create the future with the public and civil society organisations, and also to take on board the widest possible diversity of people that would not normally interact on matters of science and technology. A large number of reports and tools such as the [Eurobarometer](#) on public engagement can be found [here](#)).

Responsible Research and Innovation (RRI) can support the digital and green twin transitions ([RRI in Horizon Europe](#)). RRI can:

- make research and innovation more societally legitimate when it is developed in line with societal values.
- help research and innovation be an instrument for meeting the sustainability goals.
- in this way ensure broader societal support for research and innovation investments that are necessary to keep Europe as a competitive region globally.

Box 5. When responsible innovation meets the smart specialisation strategies

The Policy Learning Platform published an article on [responsible innovation](#) and its role for smart specialisation strategies featuring good practices such as the [Ambitious Research Development 2020, UNI/PdR 27:2017](#), the [Innovation Café](#), and [Tampere Region Open Innovation Platforms \(OIP\)](#). Thanks to interregional exchanges with [MARIE](#) partners, the Tampere region has achieved some interesting [policy improvements](#). Indeed, Tampere Regional Council and Tampere University have introduced responsible criteria such as ethics, engagement, openness/transparency and safety/reliability into a regional **ERDF call on Artificial Intelligence**. The call for projects related to responsible artificial intelligence (AI) was funded by the ERDF “Sustainable growth and jobs 2014 - 2020 – Finland’s structural funds programme”. The [policy improvement](#) was inspired by the good practice from Ireland [Broadening the Scope of Impact](#), owned by Science Foundation Ireland, as to how to focus the evaluation of the RRI criteria and the technical execution of the evaluation tool.



5. Policy Recommendations

This policy brief provides five policy recommendations, from more general to more specific advice focusing on policies to foster open, social, and responsible innovation. They are illustrated with good practices coming from Interreg Europe partners.

Policy recommendation 1. To identify regional challenges to design transformative policies

Regional policymakers must identify the most pressing regional societal challenges to design tailored and place-based transformative policies. The identification of regional societal challenges could be done through co-identification with civil society and quadruple helix stakeholders. The same participatory approach can be also used to find and experiment potential solutions.



Box 6. Good practices on the identification of regional challenges

In **IBUY**, the **GovTech Lab** is a Lithuanian platform to support public institutions to identify challenges and to engage startups and SMEs to find innovative solutions. The initiative strengthens public-private collaboration and promotes the use of innovative services in the public sector. GovTech Lab works in a five-step process, (1) a public sector institution submits its challenge, (2) GovTech Lab evaluates the challenge and launches the competition to find innovative solutions, (3) startups, SMEs, and entrepreneurs bid in the competition with their innovative solutions, (4) GovTech Lab with the public sector institution and experts select the best proposal, and (5) the private sector actors participate to the GovTech Incubator programme to prototype and develop the innovative solution. The good practice GovTech Lab allows public sector institutions to start thinking about innovation, to prioritise challenges, to connect them with the private sector, and to find solutions with social impacts.

Recommendations from Interreg Europe community

Justė Rakšytė-Hoimian, Lithuanian Innovation Centre, points out that it is very important to build a strong community of start-ups and public sector, which are eager to cooperate. Different kind of players must see the benefit of this cooperation and be ready for experimenting new solutions. As the public sector is often seen as rigid and not “experiment-friendly”, it is important to support senior management leaders to see innovation as vital for achieving their strategic goals and for creating environments that inspire and motivate their employees for innovations.



Policy recommendation 2. To experiment with challenge-oriented innovation policies

Challenge-oriented innovation policies aim to respond to societal demands or even to the “Grand Challenges of our time” and participate to the shift towards transformative changes. Regional policymakers can design challenge-based policies such as competition for start-ups or students to find new solutions to regional societal challenges (see also **Box 3** with [Demola](#)).



Box 7. Good practices on challenge-oriented innovation policies

In [INNOBRIDGE](#), Sofia Development Association, the Sofia municipal foundation for innovation in Bulgaria, organises Hackathons, challenge-based competitions where teams have 24 hours to develop minimum viable products (MVP) before pitching it to a jury. 40,000 euros is awarded to develop MVP and prototypes. The Municipality of Sofia is involved to provide challenges, funds, and assist prototype development, and commercialisation. Learning from Interreg Europe partners, namely the good practices [Entrepreneurial Campus Contest](#) and [University-Business challenge contests](#) from Castilla y León, Spain, the Hackathon was refined to add an interregional dimension and a focus on S3 priorities. The new hackathon, “Breaking the Digital Borders”, focusing on Balkan countries offers an example of how Municipal Government can promote challenge-oriented innovation policies.

In [Urban M](#), [Donostia Innovation Campus](#) is a programme to diffuse an **innovation culture to the youth of the City of San Sebastián in Spain**. The programme involves a close collaboration between educational institutions and the business sector to find practical solutions and prototypes to challenges proposed by private companies. Ultimately, the programme aims to generate positive social attitudes towards entrepreneurship and technological and scientific activities.

Initiatives, such as [Entrepreneurial Campus Contest](#), [University-Business challenge contests](#) or [Donostia Innovation Campus](#), offer the opportunity to policymakers to involve the wider civil society through dedicated events and can thus promote an inclusive appropriation of science, technology, and innovation. For instance, some dedicated events could focus on **challenge-based contests to address regional societal challenges**.



Policy recommendation 3. To support transformative changes in value chains

The [European Green Deal](#), which is the European Union new growth strategy, has introduced initiatives such as [Farm to Fork](#) or [European Industrial Strategy](#) that emphasises the role of European Value Chains (EVCs) and European strategic sovereignty to lead the twin transitions towards climate neutrality and digital leadership. The [European Green Deal](#) with its key actions and directionality will require regional policymakers to experiment with transformative innovation policies. Indeed, the [Farm to Fork initiative](#), which is part of the European Green Deal, proposes measurable targets to encourage sustainable food production, distribution, and consumption. The redesign of food systems, for instance, requires transformative innovation policies to respond to multiple societal challenges such as pollution, biodiversity loss, health impacts, and fair economic returns for farmers. Several Interreg Europe projects can be related to the [Farm to Fork initiative](#), an overview of their actions is available [here](#).



Box 8. Good practices on supporting transformative changes in value chains

In [FOODCHAINS4EU](#), [Food challenge - Eat like a Pioneer](#) is a public initiative to promote locally grown plant-based proteins in the Province of Flevoland, the Netherlands. The social innovation initiative aims to incentivise restaurants, local culinary schools, and consumers to eat more plant-based proteins—80% plant proteins—with the objectives to promote healthier and more sustainable locally grown food. As a result, the good practice aims not only to raise awareness on alternative food consumption but also to foster closer food value chains across farmers and consumers leading to sustainable food transition. This social innovation good practice can be replicated in regions that aim to promote more sustainable food value chains and locally grown food. Indeed, regions could learn how to involve different stakeholders around a challenge-based food initiative.

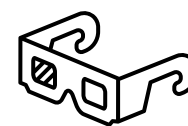
Recommendations from the Interreg Europe community

Hillebrand Koning, Province of Flevoland, emphasises the importance to involve the local farm-to-table food chain, such as farmers, apprentice chefs, hospitality and the consumer. Make the challenge 'tasty' with an appealing message such as EAT like a pioneer, 80% green on your plate. Provide visibility and excitement throughout the region, good communication tools for all participants from farmer to consumer and interesting cooking classes with well-known local chefs. This way you can really make a difference and put healthy food on the menu in a positive way.



Policy recommendation 4. To promote Living Labs for transformative changes

Living Labs are ‘defined as user-centred, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings’ ([ENoLL](#)).



Living Labs are practice-driven organisations that facilitate and foster open, collaborative innovation. They promote public engagement through co-creation between user or citizens and innovation actors in real-life environments. **Living Labs** can be used to experiment new solutions for local or regional societal challenges directly with citizens. They operate as intermediaries among citizens, research organisations, companies, cities and regions for joint value co-creation, rapid prototyping, or validation to scale up innovation and businesses ([ENoLL](#)).

Box 9. Good practices on Living Labs for transformative changes

In [INNO4SPORTS](#), the [Vitality Living Lab](#) is a 4-year project aimed to develop an innovation and business sport ecosystem. 13 public-private partners from Cluster Sport and Technology are collaborating to create innovative socio-economic solutions through case-based approaches in practical environments. The good practice underlines that innovative sport ecosystems must focus on promoting active lifestyles and must be based on strong public-private cooperation. Innovative sport ecosystems can address societal challenges such as health care costs, social cohesion, and healthy and active ageing. The project fostered new start-up activities and employment (+5 start-ups; +35 innovative solutions validated in living-labs; innovation hub for sport and vitality). The good practice illustrates that open data systems can provide insights for ideas and innovative solutions. Regions can be inspired from the good practice by creating pilot projects and using cities as ‘laboratories’ and activate private-public challenges in neighbourhoods.

In [INTENCIVE](#), the [showrooms for wellbeing technology](#) illustrate the role of demonstrators and showrooms for eHealth and telemedicine in the South Ostrobothnia region, Finland. Led by the university SeAMK, the showrooms can demonstrate, for example, robotics, artificial intelligence, and mobile health solutions related to aging and rehabilitation allowing for different stakeholders—healthcare workers, students, researchers, rehabilitation companies, citizens—to test solutions. The showroom environment was built in two separate projects: Nordic Telemedicine Center (Interreg Botnia Atlantica) and Artificial Intelligence, mHealth and Robotics as reformers in the welfare sector in South Ostrobothnia (ERDF). The good practice points out to the role of living labs within such demonstration environment to connect companies and users and students to test and develop products.



Policy recommendation 5. To promote transversal skills for transformative changes

Fablabs and makerspaces in higher education institutions can offer students to find solutions to ‘real-life’ societal challenges. FabLab and Makerspaces are flexible tools that can offer directionality to address regional societal challenges while allowing students to acquire an entrepreneurial mindset and skills to respond to emerging societal challenges.



Fablabs and makerspaces ‘allow community members to design, prototype and manufacture items using tools that would otherwise be inaccessible or unaffordable such as 3-D printers, digital fabrication machines and computer-aided design (CAD) software’. They can have different policy objectives, such as to promote an entrepreneurial mindset, to facilitate prototyping and proof-of-concept, to facilitate learning and new skills, to promote interactions among quadruple helix stakeholders, to respond to local challenges... For instance, the City of Barcelona launched the **Fab City Global Initiative** to develop locally productive, globally connected, self-sufficient cities.

Box 10. Good practices to promote transversal skills for transformative changes

In **Urban M**, the City of Zagreb, Croatia, brought changes to its programme for the **development of crafts and small and medium enterprises** to introduce specific measures such as: subsidies for entrepreneur infrastructures, co-working and maker spaces, and support to innovators who develop and promote innovation for entrepreneurship. The partner learnt from the good practices already successfully implemented in other European regions such as: **STEAMHouse**, **FabLab Lisboa**, and **FabLab Lazio**. The new programme will develop new skills related to **digital modelling and fabrication technologies** in the population.

In **ERUDITE**, the **MakerLab** is a dedicated space at the University of Ljubljana that offers access to tools and equipment such as 3D printers, laser cutters, etc. for students to implement their ideas. The **MakerLab** offers mentorship and competitions to encourage students to acquire innovative and entrepreneurial skills. Such an initiative points out to the importance to engage students to respond to ‘real-life’ practical challenges and can be a path towards public engagement to foster transformative changes in societal challenges.



Sources of further information on open, social, and responsible innovation

- European Commission - [Place-based innovation for sustainability](#)
- European Commission – [Responsible Research and Innovation \(RRI\)](#)
- European Commission – [Social Innovation Competition](#)
- Horizon 2020 project - [TeRRItoria](#)
- Interreg Europe Policy Learning Platform Policy Brief – [Innovation Networks](#)
- Interreg Europe Policy Brief – [Innovation in less-developed regions](#)
- Interreg Europe Policy Learning Platform Story - [Technology foresight for Research and innovation](#)
- OECD – [Innovation Networks](#)
- OECD – [Innovation for Societal Challenges](#)
- Science Policy Research Unit (SPRU) - [Transformative Innovation Policy Consortium \(TIPC\)](#)

If you have any additional policy questions regarding open, social, and responsible innovation, do not hesitate to contact us through our on-demand [policy helpdesk service](#).

Annexe 1: Selection of relevant Interreg Europe projects dealing with open, social, and responsible innovation

Project	Policy Objective
DIALOG	To promote citizen's engagement in defining research and innovation policies to foster social impact.
ECORIS3	To support policies and measures to foster local and regional innovation ecosystems.
ERUDITE	To enhance rural and urban digital innovation territories
FOODCHAINS4EU	To strengthen regional innovation policies to build sustainable food chains
INNO4SPORTS	To promote innovation in sports ecosystems
INTENCIVE	To enhance customer-oriented health services
ITHACA	To improve active and healthy ageing of the population
MARIE	To align the concept of Responsible Research and Innovation (RRI) with the S3 concept
OSIRIS	To solve real-life societal challenges through open social innovation methods - stimulating a bottom-up co-creation process for regional development
PASSPARTOOL	To develop key tools to assess and improve soft innovation policies, namely related to social, organisational, institutional, and open innovation
TITTAN	To improve European healthcare systems for healthy and active ageing
URBAN M	To stimulate innovation through collaborative maker spaces

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#ResearchAndInnovation #InterregEurope
#openinnovation #socialinnovation
#RRI #policylearning



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