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Innovation for place-based transformations

Tools for ACTION

EUR 31816 EN

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Innovation for place-based transformations

Tools for ACTION

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The following is a collection of tools for taking action towards place-based transformations.

This selection is an updated version of the tools included in the PRI Playbook (Pontikakis et al., 2022). They are categorised by the type of tools they represent (concept, methodology, EU policy initiative and example) and by their level of applicability (local, regional, national, European or all). Each tool is linked to the activities described in the ACTIONbook. The tools are listed in alphabetical order.

This collection of tools for ACTION is the result of ongoing collaborations with colleagues at the Joint Research Centre, across units and directorates; other Directorates at the European Commission; and external experts. Below, we would like to acknowledge and thank penholders for the tools included in this collection.

Carla Alvial-Palavicino, Antonio F. Amores, Margherita Bacigalupo, Peter Benczur, Caterina Benincasa, Erica Bol, Ana Boskovic, Alina Brebenel, Patrick Brenier, Christoph Brodnik, Jessica Cariboni, Georgios Chronopoulos, Alex Coad, Magdalena Cymerys, Sarah De Nigris, Anastasia Deligkiaouri, Dario Diodato, Mathieu Doussineau, Zuzana Dutkova, Peter Eder, Adrian Eeckels, Carlotta Fioretti, Nikoleta Giannoutsou, Ângela Guimarães Pereira, Fabrizio Guzzo, Andrea Halmos, Dries Huygens, Annita Kalpaka, Kristian Krieger, M. López Álvarez, Carmen Madrid, Sofía Maier, Marina Manzoni, Anabela Marques Santos, Cristian Matti, Fernando Merida, Michal Miedzinski, Daniel Nepelski, Luis Pedauga, Martina Pertoldi, Andreea Piriú, Emanuele Pugliese, Anna Paola Quaglia, Andrea Renda, Pierre Rialland, Mattia Ricci, Laura Roman, José M. Rueda Cantuche, Pier Paolo Saraceno, Angela Sarcina, Simone Sasso, Christian Saublens, Sven Schade, Isabelle Seigneur, Alice Siragusa, Johan Stake, Iraklis Stamos, Luca Tangi, Siria Taurelli, Giulia Testori, Davide Tonini, Rene Van Bavel and Vera Winthagen.

More colleagues have contributed to this collection with their inputs and comments. We are extremely grateful for their time and insight.

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Tool types

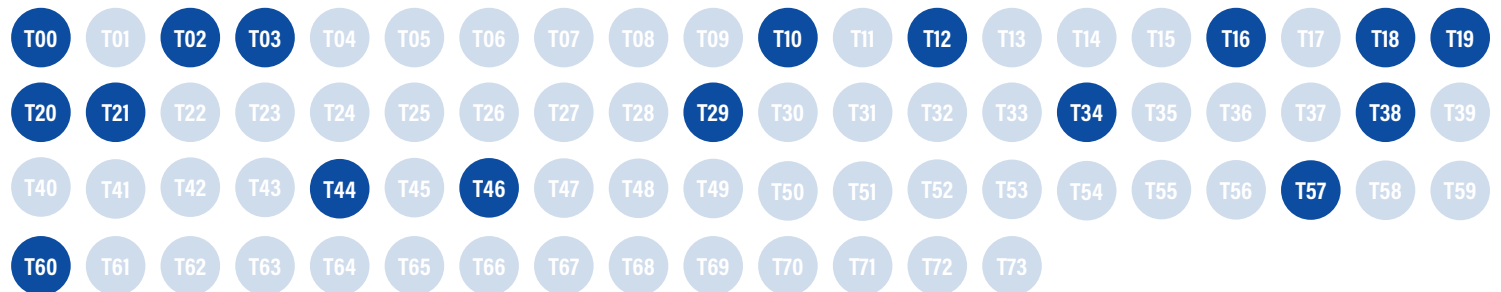
concept



methodology



eu policy initiative



example



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

A new European Bauhaus self-assessment compass

PURPOSE Applying values and principles of the new european bauhaus

USE Guiding decision-making towards neb values and principles

ACTIONBOOK ACTIVITIES all activities

AUTHORS Vera Winthagen
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Lorenzo De Simone

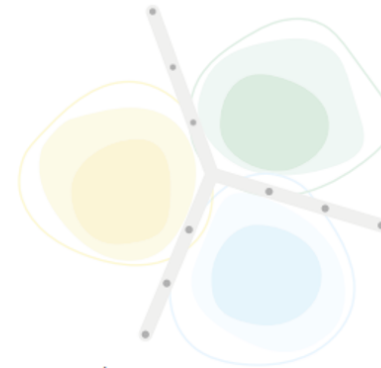
MORE → [New European Bauhaus - Use the Compass](#)
→ [New European Bauhaus - Main page](#)

Participatory process

AMBITION I: to consult

AMBITION II: to co-develop

AMBITION III: to self-govern

**Multi-level engagement**

AMBITION I: to work locally

AMBITION II: to work across levels

AMBITION III: to work globally

Transdisciplinary approach

AMBITION I: to be multidisciplinary

AMBITION II: to be interdisciplinary

AMBITION III: to be beyond-disciplinary

The NEB activates different stakeholders at different levels, from big companies to citizen initiatives, from national governments to city councils. It brings a cultural and creative dimension to the Green Deal to enhance sustainable innovation, technology and economy. The initiative brings out the benefits of the environmental transition through tangible experiences at the local level. It gives space for creation and experimentation founded on three values:

- aesthetics, quality of experience and style, beyond functionality;
- sustainability, from climate goals, to circularity, zero pollution, and biodiversity;
- inclusion, from valuing diversity and equality for all, to securing accessibility and affordability.

While it is based on three working principles:

- participatory process
- multilevel engagement
- transdisciplinary approach.

The Compass is a guiding framework for decision and project makers wishing to apply the NEB principles and criteria to their activities. It can be applied to a wide range of project typologies. It also indicates possible directions for change, with three growing levels of ambition, to support (decision and project) makers at the earliest stage of their activities. The (self)-assessment tools will then add granularity to this framework and introduce specific lists of measurable criteria for specific types of projects. You can use the Self-assessment Compass for any innovation project or activity you plan to carry out or to evaluate ongoing projects.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

AI in the public sector

PURPOSE Delivering better public services using Artificial Intelligence

USE Making the public sector more efficient and effective

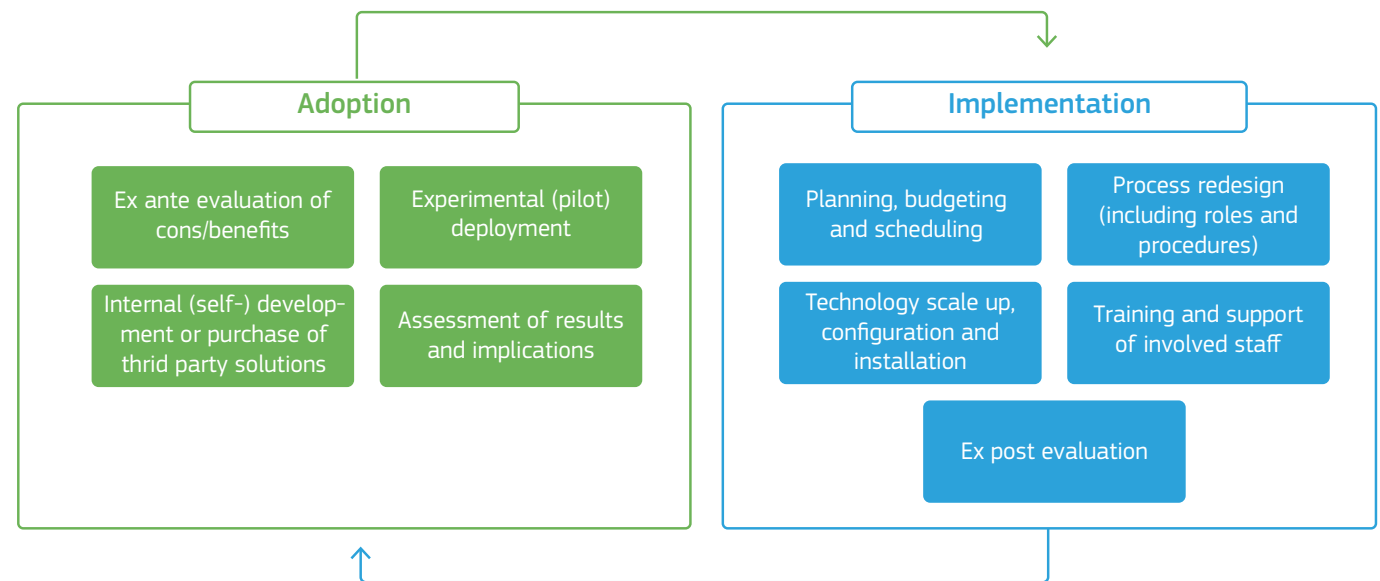
ACTIONBOOK ACTIVITIES *Designing ecosystem support*
Experimenting and demonstrating
Scaling and mainstreaming
Mobilising competences

AUTHORS Luca Tangi, Marina Manzoni
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MORE → [AI watch. Beyond pilots](#)
→ [AI Watch - Artificial intelligence in public services](#)
→ [Innovative public services](#)

Artificial Intelligence (AI) is part of our daily lives. Think about the navigation services in our smart phones, the parking assistants in our cars, or the personalised suggestions on movie and music streaming platforms – in one way or another, they are all using AI. As you may know, also the public sector is increasingly making use of AI to improve public services. In June 2022, the JRC had identified and analysed over 600 cases of using AI in the public sector in the EU. The updated version of the database is available for consultation under the [Public Sector Tech Watch](#). The cases of AI in the public sector range from rather simple chat bots to algorithms that support the review of applications for public funding. As

a so-called general-purpose technology, the possibilities to use AI to improve public services are far reaching. Currently, AI is predominantly an enabler to increase the overall efficiency of the public sector through process and task automation, but also analysis and processing of large amounts of data. However, using AI in the public sector does come with its own set of challenges, for example, related to the trustworthiness and explainability of AI, or challenges in building and using those systems. For these reasons, the journey towards the adoption of AI in the public sector is still in its early stages, and the JRC has also made a number of recommendations to help Member States throughout this process.



Appropriation of AI in the public sector.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Art-Science collaborations to spur innovation, transformation & outreach

PURPOSE Providing a framework overview for the implementation of sustainable art-science collaborations

USE Fostering transdisciplinary collaborations, participation and experimentation for regional innovation

ACTIONBOOK ACTIVITIES Continuously engaging with stakeholders
Building legitimacy
Conducting participatory foresight
Learning from experimentation

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MORE → [JRC SciArt project](#)
→ [Knowledge Valorisation Platform with best practices, including links with further information and contact details](#)
→ [S+T+ARTS collaboration toolkit](#)
→ [S+T+ARTS Collaboration Roadmap](#)

The involvement of artists and cultural organisations in research and innovation frameworks is not commonly supported by public administrations, governance or funding systems. However, the arts and creative practices are key to cultural transformations – enabling systemic shifts, as well as vibrant and socially robust knowledge ecosystems. This tool spotlights the benefits – be it social, commercial, cultural, educational or policy – brought about by supporting the inclusion of artistic and transdisciplinary practices for systemic innovation and multilevel governance of a territory. Art-science is the result of artists and scientists collaborating on a given topic of interest, generating exposure and feedback between customs and value structures. This enables inter-cultural dialogue and embeds practices in different knowledge eco-systems – driving meaning, value, participation, as well as creativity and

competence development. Collaborations between artists, scientists and policymakers have the potential to root scientific and expert knowledge (back) within a socio-cultural context, making these more relatable and thus meaningful and relevant to a non-expert public. Art-science collaborations contributes to knowledge valorisation, contests disciplinary silos, and co-creates new imaginaries for research and governance. Art-science collaborations and arts-based interventions can be implemented in a variety of organisations, administrations, and governance instances. Operationally, they function best when tailored to needs, spaces and expectations, taking into account resources and cultures.

Find out more about how to implement art-science collaborations through these [resources, tools and references](#) or otherwise [contact us](#). Funding opportunities can be explored [here](#).



Fostering transdisciplinary practices for regional innovation



Image: Anatomy of an Interconnected System, 2017.

Lament

Lament embraces overlooked stories of transformations in post-wildfire environments along two trajectories: with a focus on soil and through community engagement. Beyond the spectacular force of wildfires, Lament reflects on wildfires and the anthropogenic shifts in fire regimes by inquiring into more-than-human becoming in soil. Lament is an art-science project involving local communities, scientific researchers, EC policymakers and environmentalists around sites affected by wildfires.

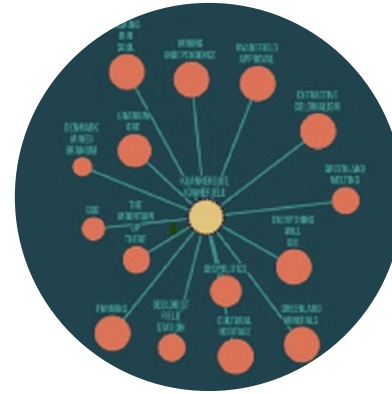


Image: from the archive Kuannersuit/ Kvanefjeld by L Autogena & J Portway

Kuannersuit / Kvanefjeld – The Mountain that became the epicentre for a discussion about Greenland’s future

How to create stronger exchanges between local communities, scientific research and policy needs? Working with and across stakeholders, artists Autogena & Portway look at a community divided on the issue of uranium mining. Exploring the difficult decisions and trade-offs faced by a culture seeking to escape a colonial past whilst defining its own identity in a globalised world, this interdisciplinary project creates connections and dialogue between key actors around the Kvanefjeld mountain. Kuannersuit / Kvanefjeld - the mountain that became the epicentre for a democratic discussion about Greenland’s future - is an art installation, video documentary and evolving online archive which examines the divisive issue of uranium mining in Greenland.



Image: Synocene presentation at Museum of Art & History Brussels, 2023.

Nature, AI and Human narratives around Nature2000 sites

Synocene is a transdisciplinary art-science project, workshop and artwork that engage local communities, Natura 2000 forests, and artificial intelligence around our manifold understandings of Nature. It enables people to express themselves and participate in the co-creation of an artwork whilst probing perceptions and needs of living next to nature reserves. A visual artist, a musician, an AI expert and a policymaker create participatory frameworks to explore how we understand nature and nature protection, co-creating processes of speculative positive futures.



Image: Parc des Ateliers. COURTESY: Atelier LUMA / PHOTOGRAPH: © Adrian Deweerdt

Using natural and renewable resources for design and architecture on a bioregional scale

Based in Arles (Fr), Atelier Luma brings together a team of designers, engineers, scientists, and experts from the fields of culture, craftsmanship, humanities, social sciences and innovation, to explore the potential of non-extractivist and often discredited local materials such as invasive plants, agricultural coproducts, algae, and industrial waste. Find out how to apply a multidisciplinary design approach to the environmental, economic, and social challenges of your territory by contacting Atelier LUMA.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Best available techniques and emerging techniques for industrial emissions

PURPOSE Innovating sustainably

USE Implementing Best Available Techniques and emerging techniques in industrial activities

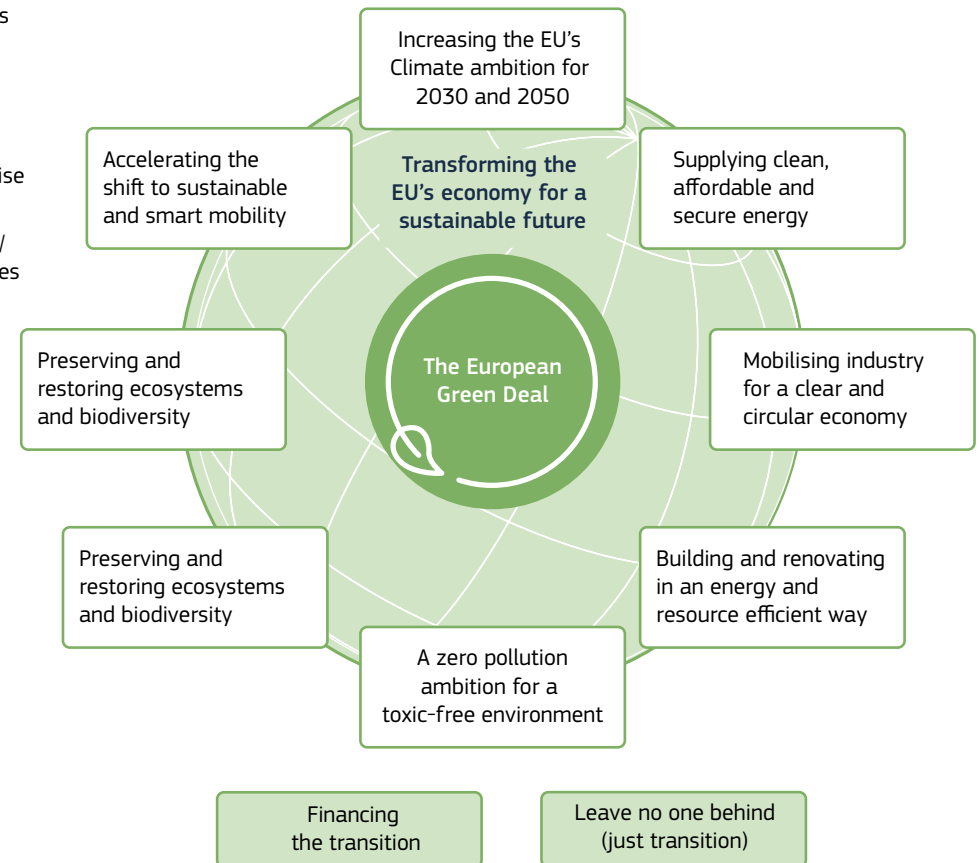
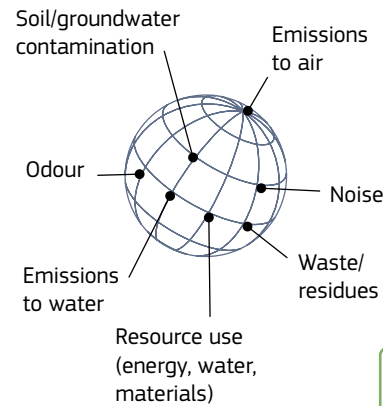
ACTIONBOOK ACTIVITIES Building legitimacy
Continuous monitoring
Evaluating impact

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MORE → [European IPPC Bureau](#)
→ [Industrial emissions and safety](#)

Best Available Techniques (BAT) indicate the techniques which are: i) the most effective in achieving a high general level of protection of the environment as a whole, ii) developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions. They refer to both the technology used and the way the installation is designed, built, maintained, operated and decommissioned. Emerging techniques (ET) refer to the techniques that, if commercially developed, could provide either a

higher general level or the same level of environmental protection and higher cost savings than existing BATs. The application of the BAT concept has assisted to reduce significantly, at EU level, the industrial emissions to air and water and to promote circularity in industrial processes. Application of emerging techniques promotes innovation and helps achieve further reduction in emissions. Both approaches will help define priorities on investment decisions and will contribute to the development of strategic technology investment pathways.



Environmental impact of industrial activities / role of BAT and ET in the EU Green Deal.

Broad-based business innovation

PURPOSE Designing a policy and action mix to support diverse business innovation capabilities, including SMEs

USE Enlarging the pool of innovating firms, strengthening overall business innovation performance

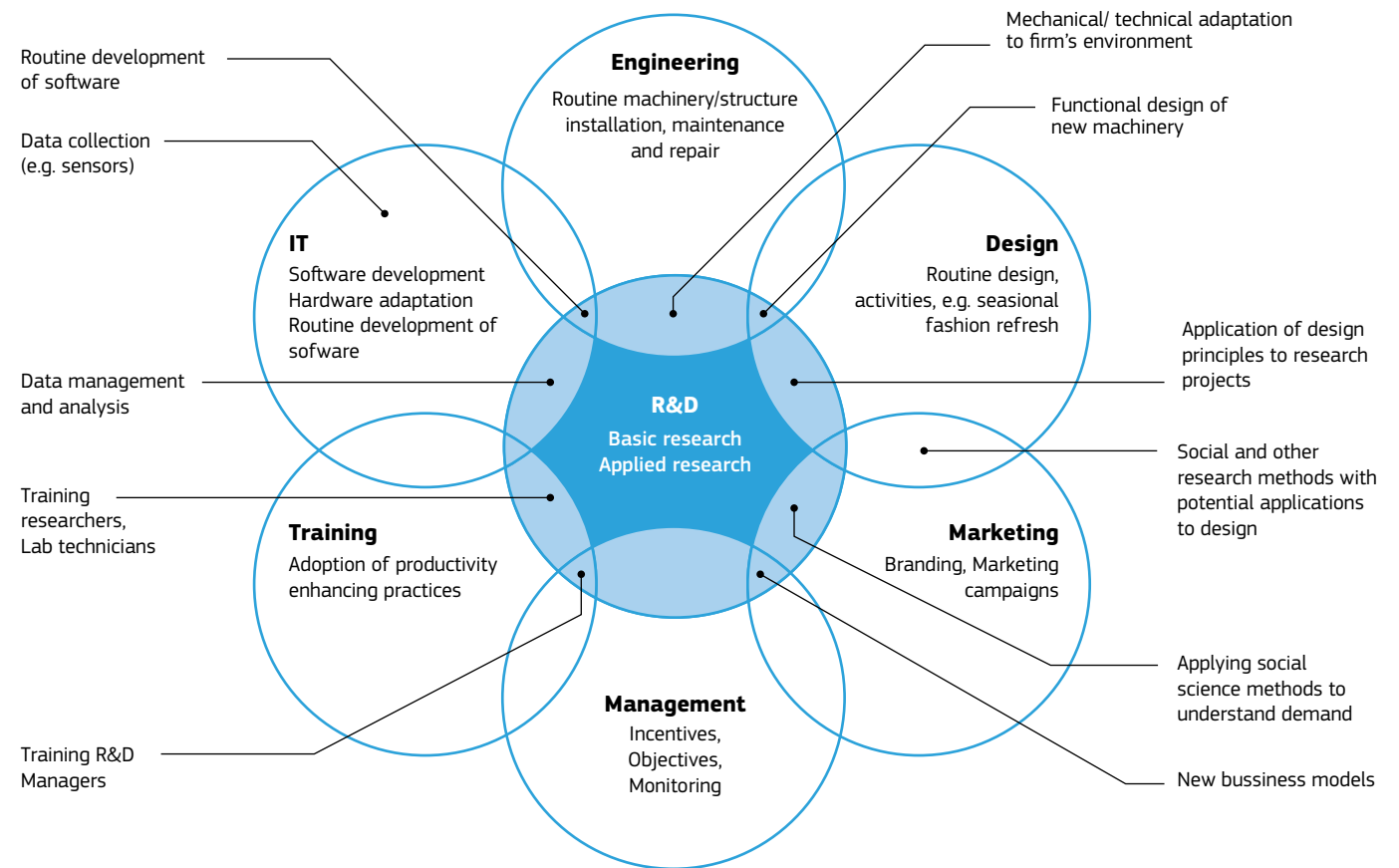
ACTIONBOOK ACTIVITIES Developing the policy and action mix
Mobilising resources
Designing ecosystem support

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MORE → [Innovation Capabilities and Directions of Development by Martin Bell.](#)

Broad-based innovation capabilities include R&D and also non-R&D innovation activities (see figure below), which are important for services firms and for SMEs.

Non-R&D innovation is complementary to and can be a stepping stone to more, more systematic and more valuable business R&D and innovation activities.



R&D and non-R&D innovation activities. Source: Adapted and expanded from a similar diagram on design innovation by Gallindo-Rueda and Millot (2015, p. 51)

If most firms in the territory are not yet reporting systematic innovation activities, the kinds of support needed to enlarge the pool of innovators should go well beyond collaborative projects with universities, that tend to exclude SMEs that do not yet engage in systematic

innovation activities. The table below helps you visualise how you can support capacity building through policies targeted at the different innovation needs of your innovation ecosystem.

Capacity building / development stage	A. From no innovation to innovation that is at least new-to-the-firm	B. From primarily new-to-the-firm to innovation that is at least new-to-the-market	C. From new-to-the-firm and new-to-the-market to innovation that is at least new-to-the-world
Policy tasks			
1. Increase the pool of innovators	Innovation training Innovation vouchers/microfinance Knowledge-intensive employment subsidies	Loan guarantees Public procurement Knowledge-intensive employment subsidies	R&D subsidies R&D tax incentives
2. Increase the intensity of innovative effort	Favourable capital depreciation allowances	R&D subsidies R&D tax incentives	R&D subsidies R&D tax incentives
3. Diversify by extending the range of innovation modes and fostering collaboration	Promote collaboration between firms, establish inter-firm networks of learning	Promote collaboration between firms, service providers and vocational education providers	Promote collaboration in dense networks of firms, universities, public research institutes and others

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Capacities for transformative innovation in public administrations

PURPOSE Indicating necessary capacities for a well-functioning multi-level governance set-up

USE Planning a rigorously coordinated process including capacity building from the start

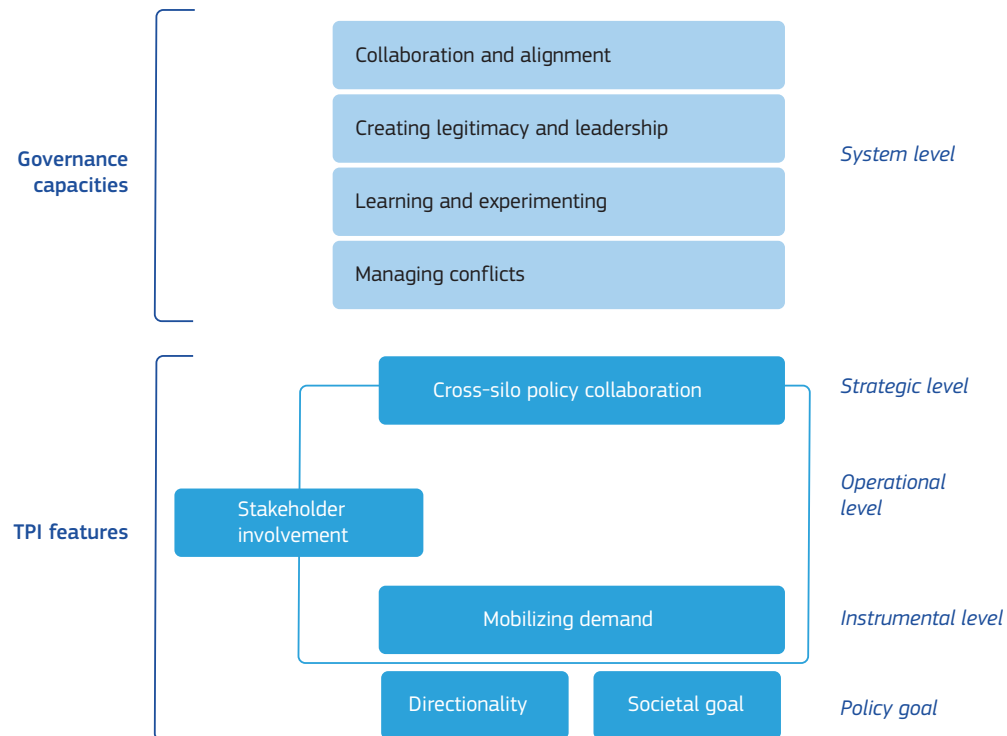
ACTIONBOOK ACTIVITIES **Diagnosing and developing a vision**
Enabling multilevel cooperation
Collaborating across departments

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Dimitrios Pontikakis
(JRC-PRI-Pilot@ec.europa.eu)

MORE → [Governance capacities for transformative innovation](#)
→ [Innovative capacities of governments](#)
→ [Capacities for missions](#)

Coordination is key considering the number of pitfalls that could exist when a State prioritises a strong goal. The government at all levels has a role in facilitating the transformative policy initiative (TPI). The underlying mechanism is to involve different ministries depending on the theme with one of them as a lead, but the diffusion part will eventually be undertaken by the other ministries. All the players involved will be helping each other in a coordinated approach. In addition, in certain new and more inclusive governance arrangements, the government could refrain from being the leader but would act as an enabler to achieve more open, transparent and diverse policy networks and policy processes across stakeholders. Directionality, societal goals and a cross-cutting policy field embedded in the societal agenda with several specific-policy domains (such as envi-

ronment, energy, health, agriculture) should be identified. In parallel, coordination arrangements between national, regional and local governments together with subnational capacity building are necessary. Striving for horizontal and vertical alignment across domains as well as multi-level and temporal policy alignment can be important for a successful transition. This requires a set of governance capacities, in particular regarding collaboration and alignment, creating legitimacy and leadership, learning and experimenting, and managing conflicts. Depending on the governance model (administration-based governance, network-based governance, or society-based governance), different pathways can be explored for developing relevant governance capacities.



T06

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Challenge-led system mapping

PURPOSE Providing a practitioner-oriented narrative for designing and implementing innovative participatory processes

USE Designing and implementing system mapping processes

ACTIONBOOK ACTIVITIES

- Identifying stakeholders for given societal goals
- Setting milestones and targets
- Developing the policy and action mix
- Designing local missions

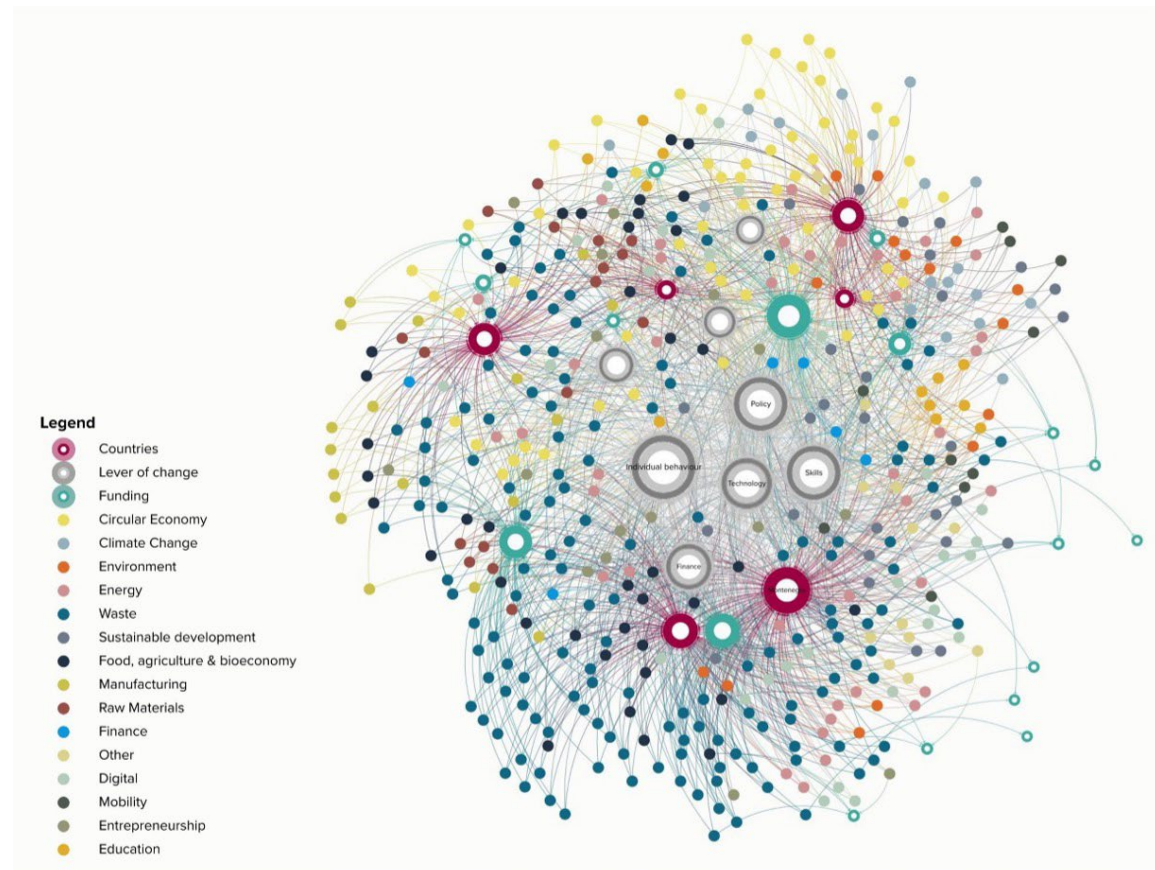
AUTHORS Cristian Matti
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MORE

- [Challenge-led System Mapping. A knowledge management approach.](#)
- [Webinar Network Analysis as a tool for science, policy and practice interface](#)
- [Example: EIT Cross-KIC project on Circular Economy in the Western Balkans](#)
[Here](#)

Challenge-led systems mapping is a flexible learning-by-doing participatory approach aimed to improve the collective understanding of system components and transformative change while allowing the exploration of governance structures, thematic priorities and innovation capacity at multiple territorial levels. Mapping processes focused on innovation portfolios allows multi-stakeholders to explore strategic opportunities,

prototyped actions, projects and interventions throughout multiple nested and articulated portfolios responding to different financial logic and institutional frameworks. At the same time, knowledge management and visualisation contribute to a collectively created notion of the socio-technical system facing specific multilevel, cross-regional and place-based topics.



Circular Economy innovation portfolio map for the Western Balkans.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Challenge-oriented innovation

PURPOSE Enabling challenge-driven innovation

USE Designing transformative policies that create multiple value

ACTIONBOOK ACTIVITIES Identifying stakeholders for given societal goals
Setting milestones and targets
Designing local missions
Experimenting and demonstrating

AUTHORS Guia Bianchi
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MORE → [Mission-Oriented Innovation Network \(MOIN\) 2021 Casebook](#)
→ [Mission-oriented Innovation Policy Observatory](#)
→ [OECD Mission-Oriented Innovation Policies toolkit](#)

Challenge-oriented (or mission-driven) innovation policy starts with well-defined societal goals and designs its research and innovation as well as regulatory measures around such goals to address them in a timely manner. Such policies consider the whole innovation cycle from research to demonstration and market deployment, mix supply-push and demand-pull instruments, ranging across various policy fields, sectors and stakeholders. Such a transversal approach is needed to achieve the SDGs. In contrast to traditional innovation policy, it aims at building policy coordination and joint ownership with

stakeholders, and guiding directionality to tilt players in the market towards societal grand challenges. You can apply the ROAR framework to advance such transformative policies, where the state behaves as ‘market co-creating’ and ‘market-shaping’. With ROAR, you can promote strategic thinking about the desired direction or Routes, the structure and capacity of public sector Organisations, the way in which policy is Assessed, and the incentive structure for both private and public sectors, or Risks and Rewards.

Routes – direction	Organisations	Assessment and evaluation	Risks and rewards
<p>Focusing on a challenge determines the direction of policy, i.e. its goal, rather than one best way to get there.</p> <p>Challenge-oriented policies should be:</p> <ul style="list-style-type: none"> • Broad to engage the public; • Enable concrete missions to create societal value; • Attract cross-sectoral investments; • Involve industry; • Allow bottom-up initiatives and experimentation; • Achieve measurable success. 	<p>To succeed implementing challenged-oriented policies, public organisations should develop and nurture skills and structures to learn and create dynamic public-private partnership through:</p> <ul style="list-style-type: none"> • Capabilities for leadership and engagement; • Experimentation capabilities; • Evaluation capabilities able to integrate approaches such as user research, social experiments and system level reflection; • Transversal skills, across disciplines and sectors. 	<p>Promoting functional finance as a government spending approach, where fiscal policy focuses on achieving desired missions, while budget deficit plays a minor role.</p> <p>Cost benefit analysis and net present value prevent proactive market creating and shaping. Instead, dynamic efficiency involves using resources to achieve changes over time to achieve goals.</p> <p>Defining concretes target and objectives is critical.</p>	<p>Treating investments as a portfolio, to balance wins and losses, thus reaping (financial) benefits to fund investments in other areas/policies/initiatives and/or learning from failures.</p>

Grand Challenge



Mission



Areas of interest & cross-sector



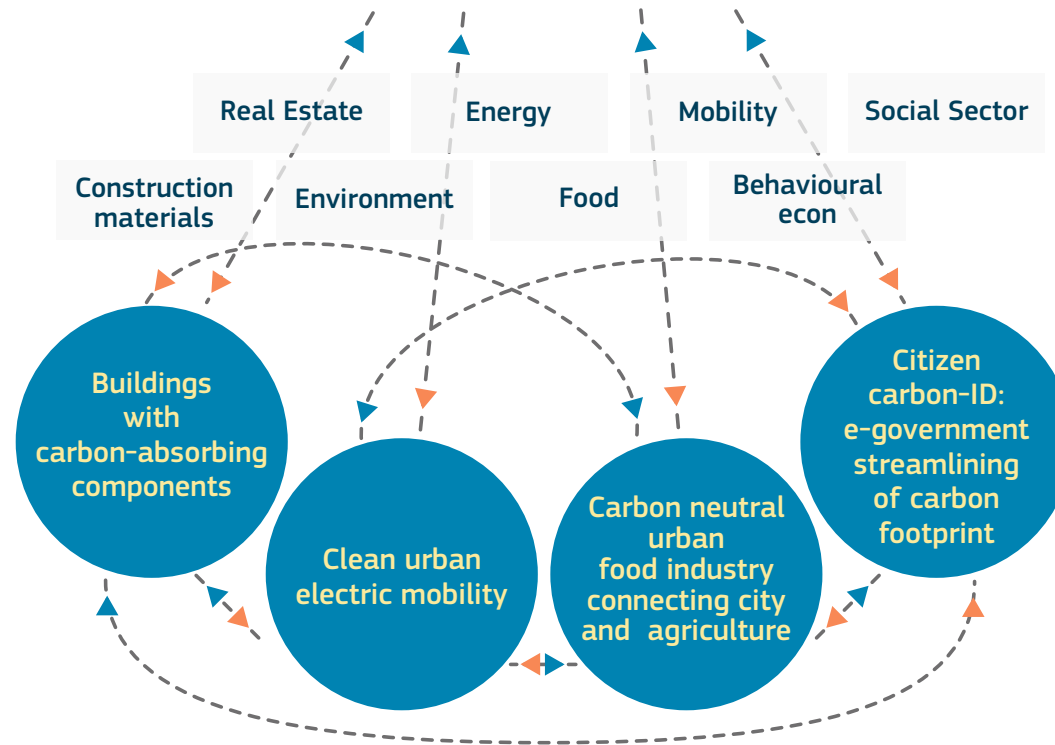
R&I Projects

CLIMATE CHANGE



100 CARBON NEUTRAL CITIES BY 2030

Reach net zero greenhouse gas emissions balance of 100 European cities by 2030



100 carbon neutral cities by 2030. Source: Mazzucato 2018.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Citizen engagement in support of biodiversity: BiodiverCities

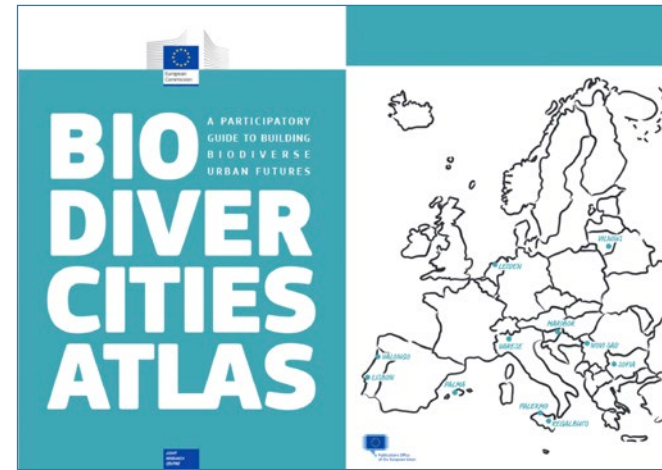
PURPOSE Engaging citizens in policymaking and research for biodiversity protection

USE Inspiring cities to learn and replicate

ACTIONBOOK ACTIVITIES Continuously engaging with stakeholders
Building legitimacy
Conducting participatory foresight
Agenda setting and sharing

AUTHORS Anna Paola Quaglia
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MORE → [Participatory and Deliberative Democracy - Main page](#)
→ [BiodiverCities Atlas: A participatory guide to building urban biodiverse futures](#)
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The BiodiverCities Atlas shows the case-studies of ten European cities - Palermo, Regalbuto, Varese, Lisbon, Valongo, Palma, Leiden, Maribor, Novi Sad and Vilnius. They were selected to conduct a co-creation process, locally engaging citizens in support of urban biodiversity. The [Atlas](#) presents highlights, institutional and practical challenges, and lessons learnt from the local engagement processes, accompanied by several contributions from social and natural researchers. The diversity of citizen engagement formats, political and institutional cultures used across these ten cities, has showed how public institutions and citizens can work together to meaningfully address, pressing challenges such as biodiversity decline or liveability of our cities. Three lessons of relevance to different policy domains are:

1. Move away from behavioural change and information-transfer mindsets, rather focus on social and institutional change. Novel understandings of change are needed, as daily choices and ways of living are embedded in complex regulatory, infrastructural and cultural systems. Without tackling these, change risks being left to individual pledges. Engaging citizens enables space to invite different publics to political discussions that matter to all.
2. For responsible, humble and reflexive policymaking, invest in institutional change and in building new ca-

pacities. This demands renewed institutions (i.e.,

institutional innovation) that, at all levels, start to work differently, internally and with citizens for an inclusive and sustainable present. BiodiverCities sheds light on what the political and institutional enabling conditions are for citizen engagement to happen at local level, proposing ways to address challenges met along the way.

3. Situated knowledge is not “dull” knowledge. From technological developments to climate change, several contemporary challenges imply governing uncertainties of different kinds: uncertainties in the features of the challenge itself, of its outcomes, of its ethical and socio-cultural implications and its political management. Understanding local contexts, political culture, concerns and needs, by valuing situated knowledge, limits the risk of creating new vulnerabilities and tensions.

How can we support?

The European Commission’s Competence Centre on Participatory and Deliberative Democracy is equipped to provide the expertise, tools and methods needed to support citizen engagement processes. It is collaborating actively with an extended community of practitioners across EU countries and can offer guidance and support to other interested institutions, e.g., trainings to public officials and local administrations.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Citizen science

PURPOSE Innovating in evidence-based policymaking

USE Fostering social innovation in local contexts

ACTIONBOOK ACTIVITIES Identifying stakeholders for given societal goals
Continuously engaging with stakeholders
Designing ecosystem support

AUTHORS Sven Schade
Marina Manzoni
(JRC-Digital-Governance@ec.europa.eu)

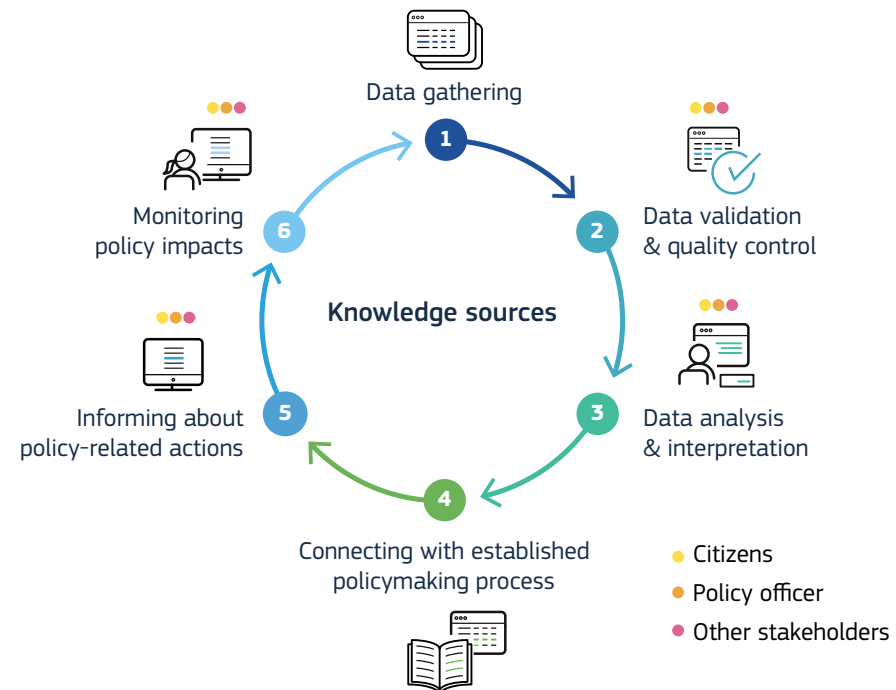
MORE → [Activity Report on Citizen Science – discoveries from a five year journey](#)
→ [Scaling up Citizen Science](#)
→ [Citizen science and the United Nations Sustainable Development Goals](#)

Citizen Science (also known as public participation in scientific research) evolved from a long tradition in fields, such as biodiversity and meteorology, into almost all scientific fields. Simultaneously, regional and global communities became well organised and interconnected, and we arrived at a situation in which Citizen Science is not only prominent in research and civil society, but also well recognised in policy (e.g. related to Open Science and Better Regulation).

On the one hand, citizen scientists can contribute with valuable knowledge to scientific research, and thereby help innovate evidence-based policymaking. The benefits have been recognised long ago in terms of bird monitoring, weather monitoring and other environmental fields. Today, structured approaches exist that enable citizens to contribute data that they observe in their immediate environment to official monitoring processes at

sub-national, national and international levels. Such engagements enable citizens to provide valuable contributions to science and policy, while they also help raise awareness and educate about environmental topics. The monitoring of the Sustainable Development Goals (SDGs) can be well supported.

On the other hand, knowledge creation and sharing between citizens, scientists and public administrations can also help develop a shared understanding of matters of concern, and it can empower all participants to co-design solutions that fit each other's needs. For example, people living in the same neighbourhood might collect data about certain environmental stresses (such as noise or odour), patterns and sources of these stresses could be identified, possible solutions discussed with all that are involved, and then implemented with the relevant public authorities.



Integrating citizen science with evidence based policy making, a cycle of six steps.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Citizens engagement in innovation policy

PURPOSE Empowering citizens

USE Proactively influencing innovation policy

ACTIONBOOK ACTIVITIES
Continuously engaging with stakeholders
Building legitimacy
Conducting participatory foresight
Agenda setting and sharing

AUTHORS
Ventseslav Kozarev
Ângela Guimarães Pereira

MORE
→ [Competence Centre on Participatory and Deliberative Democracy](#)
→ [Community of Practice at the Competence Centre on Participatory and Deliberative Democracy](#)

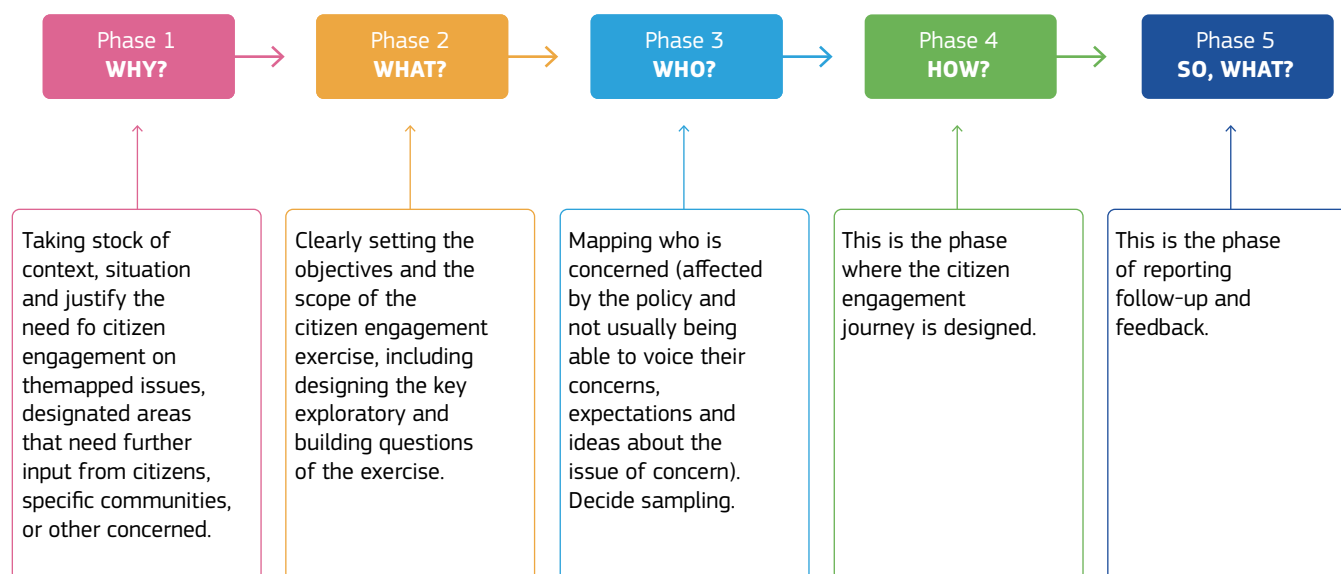
By engaging citizens in participatory and deliberative exercises, policymakers can contribute to making innovation processes resonate with citizens' expectations and knowledge. This is especially true when these processes become inclusive and reach out to citizens who do not usually have a voice in innovation or innovation policy. Participatory and deliberative exercises thus increase the likelihood of generating fit-for-purpose and responsive innovations that could be more readily taken-up in society.

Well-designed and targeted participatory exercises can deliver timely and useful insights to help innovators grasp, leverage or mitigate social, ethical and other non-economic aspects of innovation. Therefore, by engaging citizens more systematically, innovators could explore societal concerns, expectations and values in relation to the problem a particular innovation is meant to address, and eventually generate both better public value and higher business returns.

Engaging citizens can also help pre-emptively understand, and respond to, possible controversies generated

by arguably reckless technological innovations. Hence, citizens can play an active role within innovation ecosystems. Through engagement, collaboration and co-creation, they get empowered to influence future pathways for innovation, resulting in improved trust in innovation systems and in innovation policy. They further get engaged more prominently in the monitoring of the deployment of technology, seen through the real impact on their lives.

In practical terms, you can plan a citizen engagement exercise over five basic phases, as depicted below. Citizen engagement exercises can be set up independently, or in conjunction with stakeholder-oriented formats, including the involvement of policymakers and innovators alike. The Commission's Competence Centre on Participatory and Deliberative Democracy is equipped to provide the expertise, tools and methods needed to support the design and implementation of these exercises. It is collaborating actively with an extended community of practitioners across EU countries, and can offer guidance and support to other interested institutions.



The five phases of planning a participatory process.

TYPE
concept
methodology
eu policy initiative
example

LEVEL
local
regional
national
european

Co-creation for policy

PURPOSE Providing a practitioner-oriented narrative for designing and implementing innovative participatory processes

USE Organising policy co-creation processes and events in a purposeful and structured way

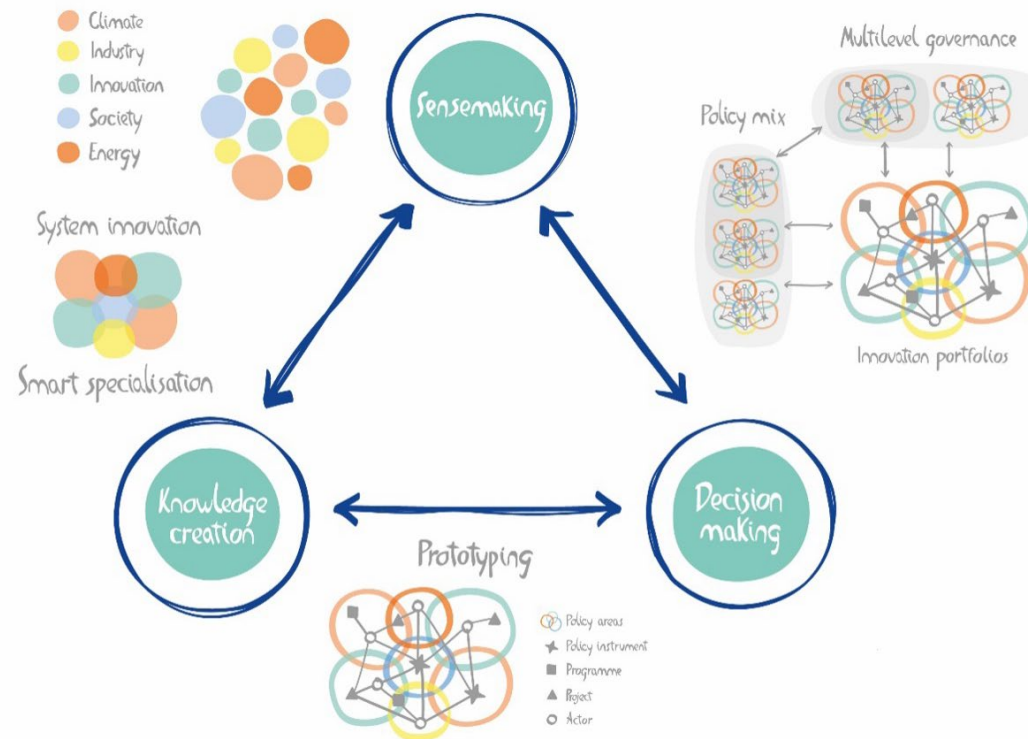
ACTIONBOOK ACTIVITIES
Identifying stakeholders for given societal goals
Enabling multilevel cooperation
Collaborating across departments
Collaborating across territories
Developing the policy and action mix
Designing local missions

AUTHORS Cristian Matti
(cristian.matti@ec.europa.eu)

MORE
→ [Co-creation for policy. Participatory methodologies to structure multi-stakeholder policymaking processes](#)
→ [Transitions policy lab webinar on co-creation for policy](#)

The co-creation for policy handbook provides practical steps and recommendations for identifying synergies among stakeholders across territories, sectors and levels. It shows how to ensure optimal knowledge management and efficient communication to optimise resources use, policy convergence and the achievement of positive results when designing or implementing policy. By com-

binning community engagement and knowledge management services, the handbook highlights how participatory processes can be embedded in the policymaking cycle to improve the societal value of generating collaborative innovation, goodwill and co-created evidence for informing policymaking.



Knowing cycle in policy co-creation processes. Source: Matti et al., 2022.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Competence framework for 'innovative policymaking'

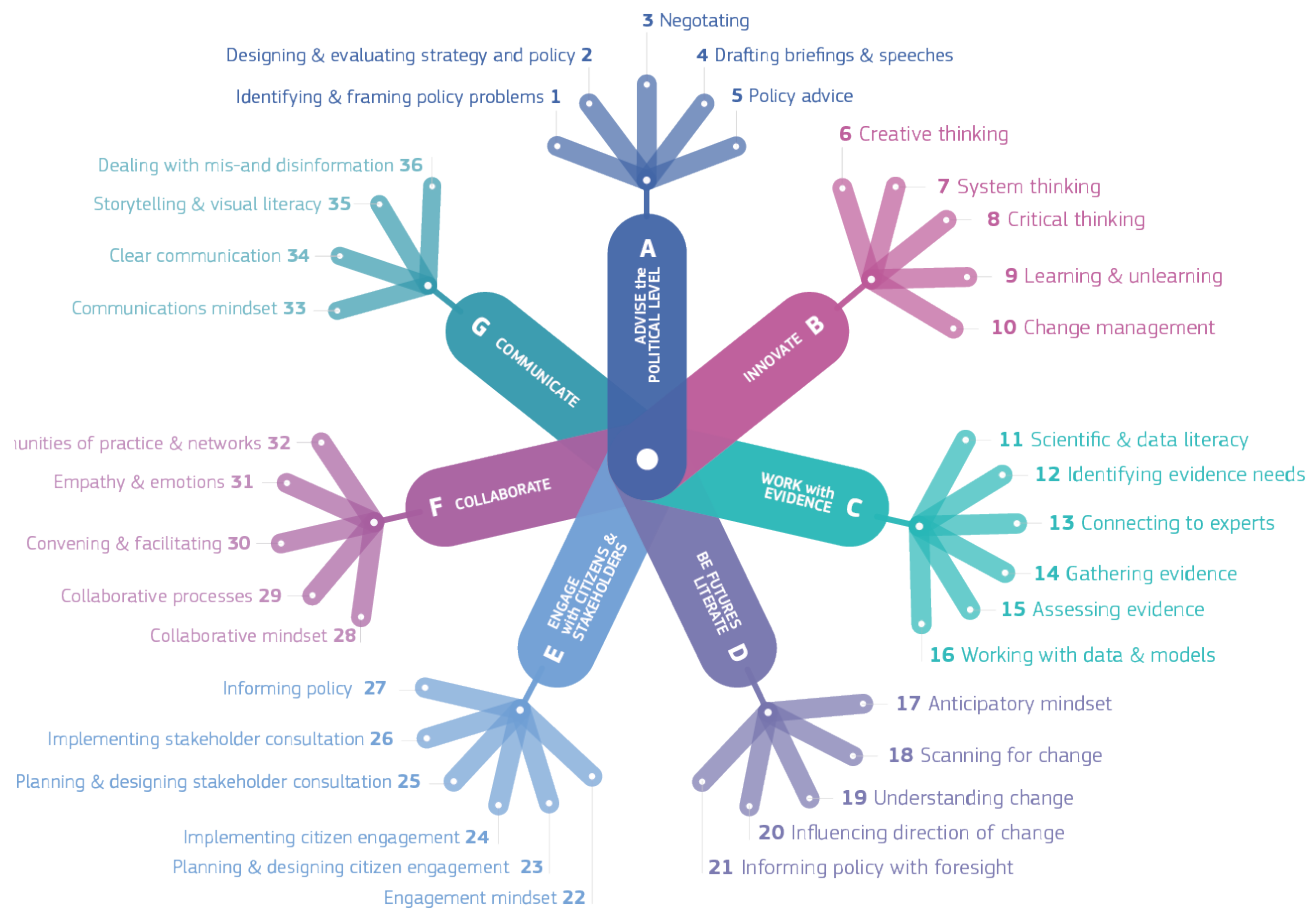
PURPOSE Supporting policymakers to develop relevant competences on innovative policymaking

USE Developing and mastering competences needed in innovative policymaking

ACTIONBOOK ACTIVITIES Conducting participatory foresight
Designing ecosystem support
Mobilising competences

AUTHORS (EC-SMART-FOR-POLICY@ec.europa.eu)

MORE → [Competence framework on innovative policymaking](#)



In a fast-changing world and faced with global challenges of climate change, digital and green transitions, the public sector and policymaking institutions are actively seeking and deploying new and innovative approaches to policymaking and regulation. This also requires **policymakers to continue developing new competences**, or upgrade existing ones, to rise to the global challenges and be able to deliver innovative and future-proof policy solutions. The EU Policymaking Hub is the professional development programme of the European Commission exactly targeted at developing such policymaking skills and competences. For this, it has developed a vision and a framework for innovative policymaking competences. While traditionally the focus on policymaking competence development centred on the

activities structured around the policy cycle, namely policy planning, policy design and impact assessment, policy implementation and policy evaluation phases, the ability to tackle global, interconnected and complex societal challenges requires a more developed and future-oriented vision of policymaking competences. The policymaking competence framework identifies a **set of seven essential crosscutting competence areas** that are necessary for innovative policymaking at every stage of policymaking. The framework contains seven competence clusters (A-E). Each cluster contains competences, described in knowledge, skills and attitudes required to master this competence from a foundational up to an expert level. There is a total of 36 competences on innovative policymaking.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Competences: empowering civil servants to create sustainable prosperity

PURPOSE Pursuing transformative ideas in the public sector

USE Developing and nurturing employees with an entrepreneurial mindset

ACTIONBOOK ACTIVITIES

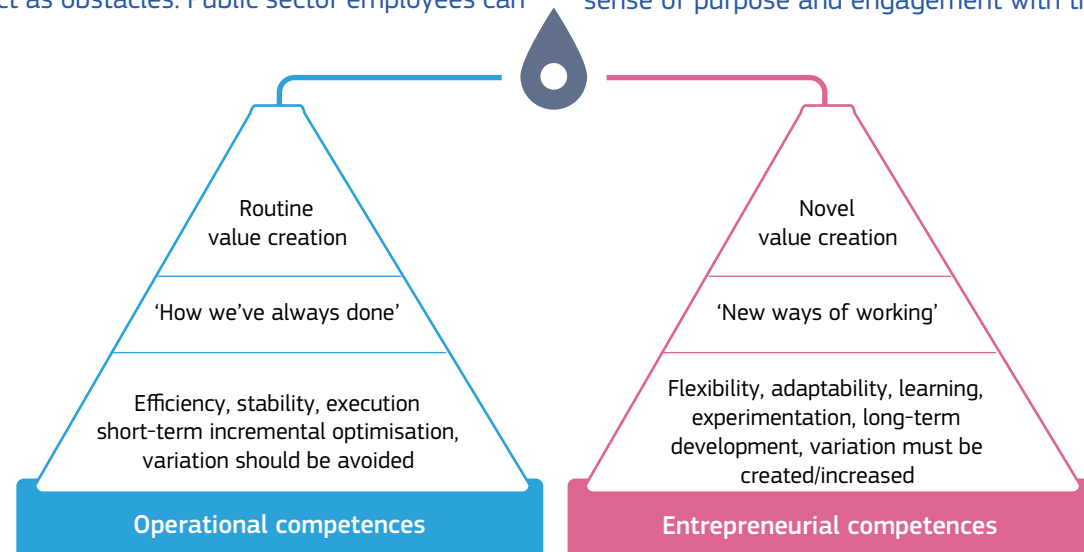
- Setting up a network governance
- Enabling multilevel cooperation
- Scaling and mainstreaming
- Managing and transforming knowledge
- Mobilising competences

AUTHORS Margherita Bacigalupo
(JRC-PRI-PILOT@ec.europa.eu)

MORE → [The entrepreneurial Employee in the public and private sector. What, why, how.](#)

“Experimenting with new ideas is not part of my job. Public organisations should not waste public money on trial-and-error”. In an increasingly volatile, uncertain, complex and ambiguous world, can public administrations focus only on routine value creation, i.e. delivering what has worked so far to address well-defined problems? Given the unprecedented pace of innovation, worsening environmental conditions, and changing citizen needs, public administrations need to future-proof their strategy by supporting purposeful innovative ideas that create value for society and contribute to the SDGs. To this aim, civil servants need to be equipped with the entrepreneurial competences to address complex challenges and ill-defined problems creatively, to cope with uncertainty ambiguity and risk, to mobilise resources so that they can transform such ideas into public value. This can be hard to achieve, given that current organisational structures and cultures may tend to allocate resources and rewards to deliver routine work. In this light, public sector employees could think that experimenting with new ideas is not part of their job or organisation. Furthermore, resistance to change and fear of failure can also act as obstacles. Public sector employees can

become more entrepreneurial by performing a balancing act: being flexible and exploring new ways of working and interacting with different stakeholders, while also delivering on their daily tasks, where execution and efficiency are prioritised. Entrepreneurial employees care about their job, try hard to envision experiment, and collaborate to create new kinds of value for others and they are an important asset for your organisation to address “glocal” sustainability challenges. Employees with an entrepreneurial drive surely work in your organisation already. They just need to be given slack resources, time and autonomy as well as trust to pursue their ideas. You may have a key role in providing leadership and institutional support. By enabling your team to become more entrepreneurial you are likely to help your organisation remain relevant and keep delivering value to its intended beneficiaries despite disruptions, setbacks and uncontrollable externalities. What is more, you will also see how the motivation of the staff working in your organisation will increase, as pursuing the creation of value someone cares about enhances their sense of purpose and engagement with their job.



Balancing operational competence and entrepreneurial competences.

T14

TYPEconcept
methodology
eu policy initiative
example**LEVEL**local
regional
national
european

Competences for the green and digital transition

PURPOSE	Inspiring change in your education and training systems
USE	Equipping citizens with competences to play a creative role in the twin transition
ACTIONBOOK ACTIVITIES	Collaborating across departments Collaborating across territories Mobilising competences
AUTHORS	Guia Bianchi (JRC-PRI-PILOT@ec.europa.eu)
MORE	→ Scaffold video → Scaffold guide

Technological innovations, climate change, demographic trends, migration flows, together with sudden shocks such as financial crisis, pandemic outbreaks or shifts in global order are changing societies and economies thus affecting how Europeans live and engage in society, including in the labour market. They also affect your job as policy maker, faced with challenges of unprecedented complexity.

One of such challenges is ensuring people have the knowledge, skills and attitudes that allow them to fulfil their aspirations while contributing to shared global responsibilities (e.g., the SDGs). How can you equip people with the future-fit competences that empower them to thrive in a fast-changing world when the future is so uncertain? How can you teach them what they need to shape the digital and green transitions to achieve collective prosperity? This is the case even when those who are in education and training today may end up working in sectors that do not yet exist, developing knowledge in disciplines that are emerging, interacting with technologies that are yet to come.

First and foremost, it is essential that you decouple learning from education provision. Learning happens at school in as much as in non-formal training or through informal learning experiences. By taking a lifelong and life-wide approach to learning, you ensure that you focus not only on providing people with basic skills (litera-

cy, numeracy and basic digital skills) and civic competences, but also competences that will help them face complexity and change.

Such competences include, for example, personal and social competences, at the core of individual resilience and well-being; the capacity of learning to learn, essential to shape the course of transformation and adaptation ([LifeComp](#)). Also included is the capacity to turn ideas into action, fundamental to generate new value for oneself and society ([EntreComp](#)). Then, sustainability competences are critical and key to ensure that human action and value creation remains within planetary boundaries ([GreenComp](#)). Least but not last, digital competences are essential and build confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and participation in society ([DigComp](#)).

The European Commission has developed a series of reference documents and support tools to help you innovate in lifelong learning by embedding the competences society needs to make the twin transition a process of transformation that is just and inclusive. The European Training Foundation and the European Commission have also developed a set of cards, [Scaffold](#), to help educators and trainers, but also self-learner, play and integrate competences in their learning activities.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Competences: futures literacy

PURPOSE Understanding possibilities ahead to make more informed decisions in the present

USE Stretching your thinking and imagine possible futures

ACTIONBOOK ACTIVITIES

- Diagnosing and developing a vision
- Conducting participatory foresight
- Developing transition pathways and roadmaps
- Setting milestones and targets
- Agenda setting and sharing
- Mobilising competences

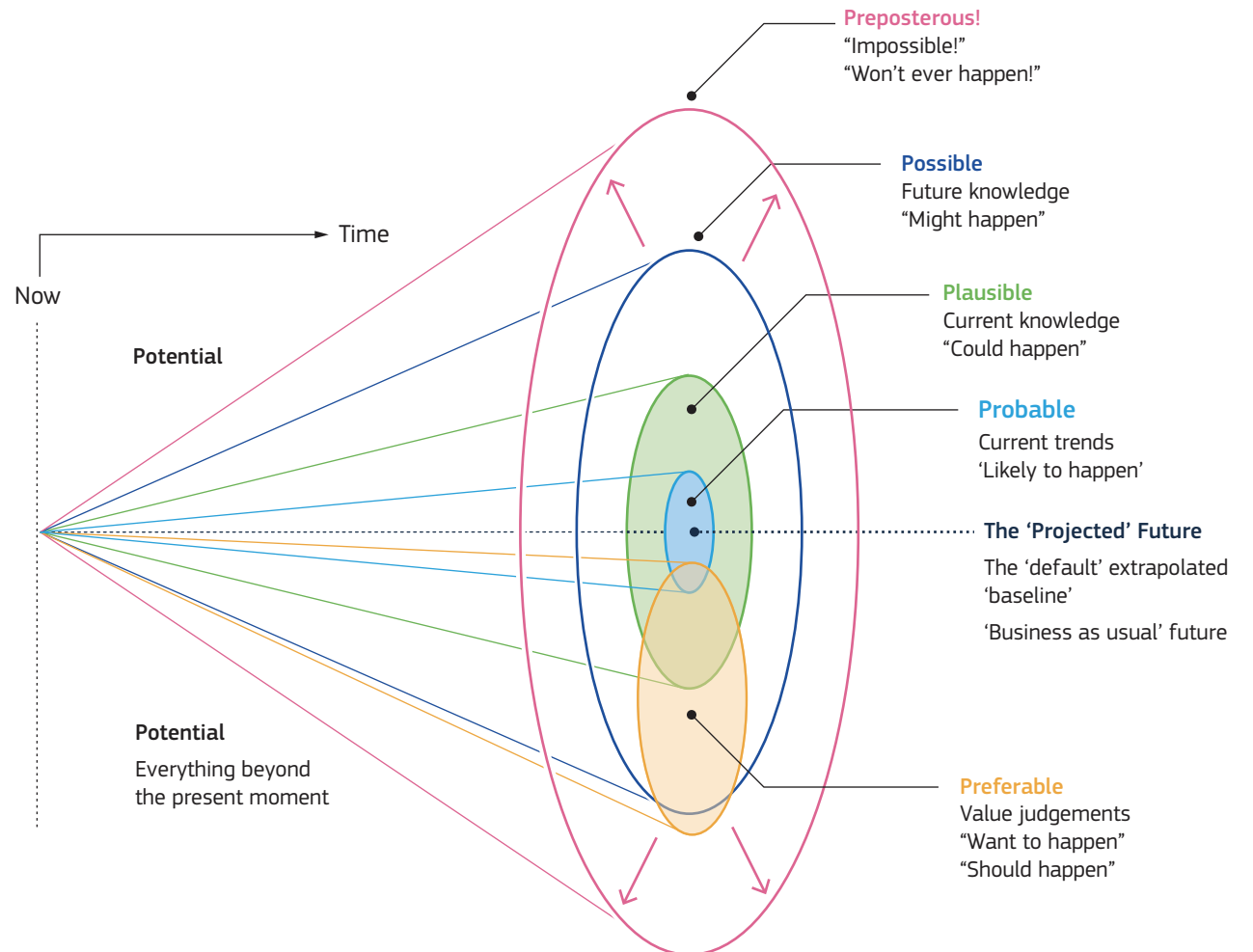
AUTHORS Erica Bol
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MORE

- [The Futures Cone, use and history – Joseph Voros](#)
- [Competence Centre on Foresight, Joint Research Centre, European Commission](#)

When thinking about the future we tend to extrapolate the present into the future as a business-as-usual future. But next to this business-as-usual future there are multiple more futures that can unfold. Probable futures, that can arise due to current trends, or even possible futures, that might happen due to new developments

we might not even be aware of now. By stretching our thinking, and being able to imagine all of these different futures, the discussion about the preferable future is much richer, and also prepares us to be more flexible and open to alternatives.



The Futures Cone. © Adopted & Extended from Joseph Voros (2003).

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Competences: SELFIE tools for organisational capacity & competence development

PURPOSE Providing tools of collective and individual self-reflection

USE Conducting self-reflection on digitalisation

ACTIONBOOK ACTIVITIES Mobilising competences

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MORE

- [European Framework for Digitally Competent Educational Organizations](#)
- [European Digital Competence Framework for Educators](#)
- [SELFIE](#)
- [SELFIE for Work Based Learning](#)
- [SELFIEforTEACHERS](#)

The SELFIE tool developed by the JRC engages school leaders, teachers, students and in-company trainers (SELFIE WBL) in an anonymous, collective reflection on how digital technologies are used for teaching and learning. The results of the reflection are captured in a report, which is used as a basis for discussion among the school community and action planning. The SELFIE process aims at promoting a culture of participation and collective responsibility for the introduction of change in schools. (see top figure). SELFIEforTEACHERS helps teachers self-reflect on their digital competence and supports their further development (see bottom figure). The tool is a continuous learning process, allowing teachers to understand what digital competence entails. By completing a self-reflection, teachers can identify their needs and plan their professional learning based

on the tool feedback. Through their dashboard, teachers can keep a history of their self-reflections and compare their progress over time and group and global averages. SELFIE and SELFIEforTEACHERS can benefit schools, teachers but also education and training systems by providing aggregated data which can inform digital education planning and teacher training. The self-reflection tools can be considered as an instrument-based approach to innovation and policy-making as they emphasise the emergence of new practices around these tools and have the potential to gather around their use a community of stakeholders at different levels of governance (school community, educators, companies, school leaders, teacher training centres, regional and national authorities).

Collective reflection process with SELFIE and SELFIE WBL.



- 1 Set up
- 2 Respond
- 3 Discuss
- 4 Plan
- 5 Monitor
- 6 New round

Monitoring progress based on SELFIEforTEACHERS self-reflection results.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Contribution of civil society organisations

PURPOSE Involve civil society organisations in policymaking

USE Engaging with a broader range of stakeholders

ACTIONBOOK ACTIVITIES Continuously engaging with stakeholders
Conducting participatory foresight
Agenda setting and sharing

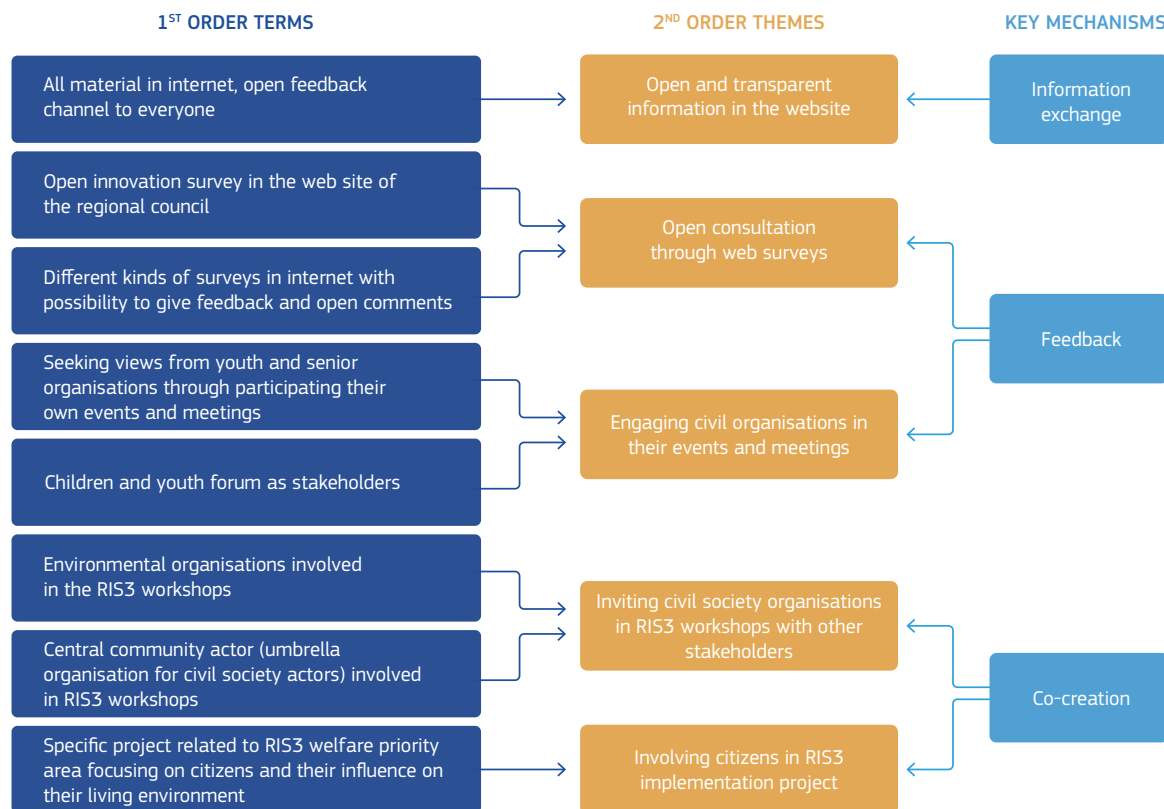
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MORE → [Facilitating the participation of civil society in regional planning: Implementing quadruple helix model in Finnish regions](#)

Following the post-Covid-19 era, there is currently a great desire for Civil Society Organisations (CSOs) to emerge and contribute, however, this is not at all straightforward. Common impediments surrounding CSOs are awareness, motivation and skills issues. Also, their initiatives tend to be highly heterogeneous and location-specific. However their inclusion in a partnership could contribute to valuable input and increase the diversity of knowledge, values, ideas and perspectives. They could push for a more place-specific endeavour by bringing attention to local problems and needs, lead to creative ideas and could play a major role as co-creator of innovation. They could turn a partnership into a more democratic process, possibly motivated by an alternative vision and a more progressive understanding of re-

gional development. However, there can be an automatic mismatch between the need for and ability of, CSOs to act on behalf of citizens' and community desires to bring about change. The need for CSOs to fill the policy space tends to be greater where local government has less discretion and fewer resources to act, than in a scenario where local government has significant resources and policy discretion, which would probably be the occasion where CSOs are mostly needed. Their participation in innovation policy could be in policy design aiming to enhance the accountability and transparency of policy-making and improving government decision-making. In the figure below, you can see the different mechanisms to facilitate the participation of CSOs in regional planning.

Mechanisms to facilitate the participation of the civil society in regional planning. Source: Roman and Fellnhöfer, 2022, p.5.



T18

TYPEconcept
methodology
eu policy initiative
example**LEVEL**local
regional
national
european

Energy consumption taxation

PURPOSE Measuring the burden of taxation on household energy consumption in the EU

USE Understanding tax incentives toward the green transition

ACTIONBOOK ACTIVITIES **Building legitimacy**
Evaluating impact
Continuous monitoring

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Sofía Maier, Mattia Ricci

MORE → [EUROMOD](#)

The taxation of energy consumption is a central topic in the current policy debate. On the one hand, energy taxation is a key lever for the achievement of the ambitious EU 2030 climate targets. Raising minimum rates for energy products underpins one of the major legislative initiatives of the European Green Deal, such as the Revision of the Energy Taxation Directive. On the other hand, the current energy crisis is causing dramatic increases in the price of energy products across the EU, raising calls for reducing their taxes to support households and firms.

However, measuring and monitoring the burden of taxation over energy consumption is a challenging task. Differences in consumption patterns across Member States – such as the use of heating in countries exposed to different climates – imply that even similar tax systems might affect consumers differently across the EU. Furthermore, energy consumption is subject to multiple and interacting rates of tax, such as VAT and specific excises, which are expressed in different units (i.e. percentage vs unit of currency).

The indicator of implicit energy consumption taxation (see the graph below for 2019) represents households' total burden of taxation over the price of each energy

product (in percentage terms). It allows measuring the tax burden over energy consumption for households in each Member State.

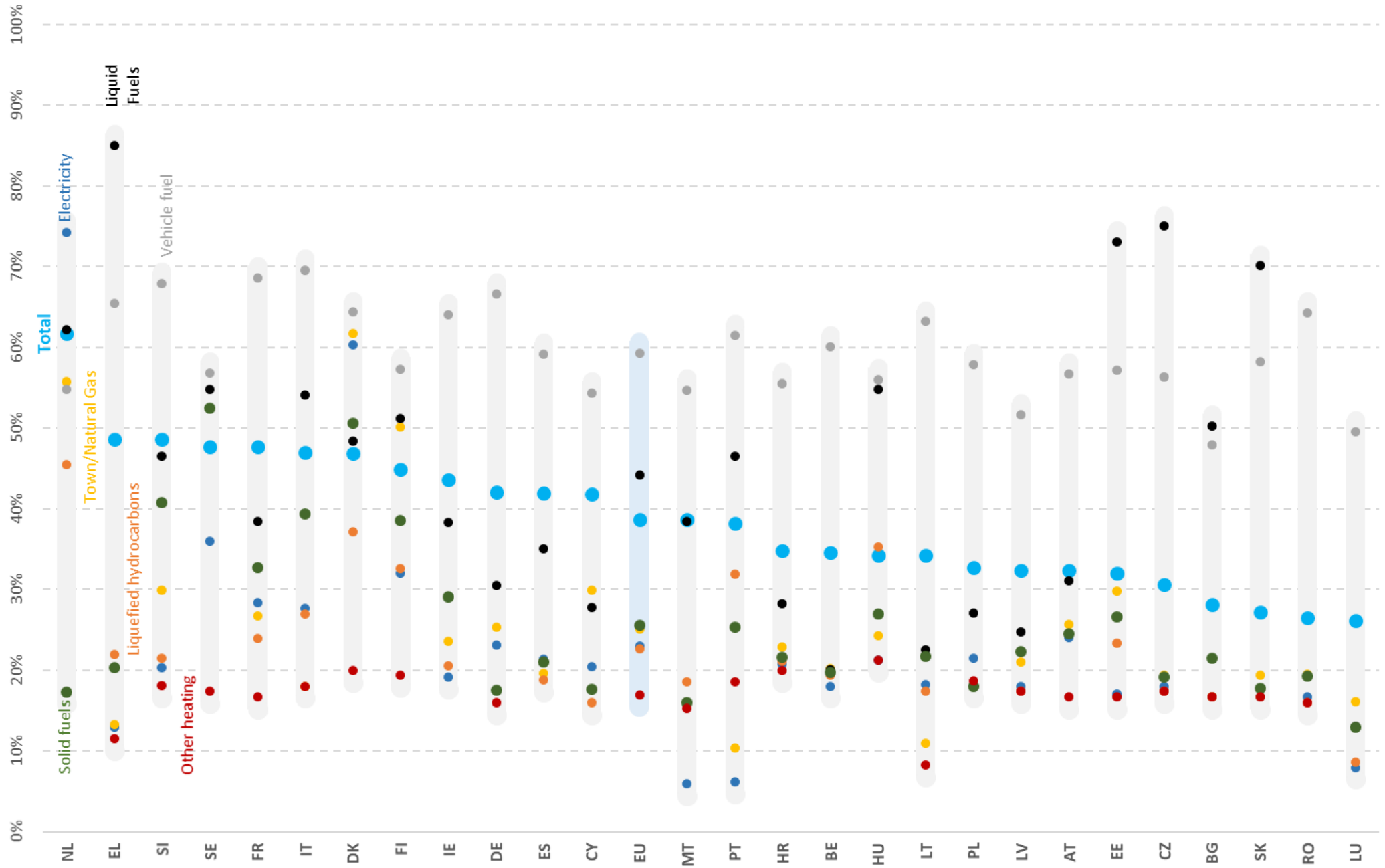
In the EU, the implicit tax rate of the energy bundle ranges between 60% and 20%. While rates vary significantly across countries, vehicle fuels (e.g. petrol and diesel) and liquid fuels (e.g. heating oil) generally feature the highest rates of taxation. At the other extreme, 'other heating products' (e.g. district heating) are usually the least taxed. Moreover, solid fuels (e.g. coal, biomass) are in various cases taxed in the low range despite their important environmental and health impact, while less polluting energy sources, like gas, are more heavily taxed.

Information on implicit tax rates at the product level and across the EU27 can help policy makers to identify where there is comparatively more room for tax rate adjustments, also in consideration of practices in other Member States.

These taxes are generally regressive, when measured against household disposable income. Remarkably, the redistributive consequences of two very similar implicit tax rates can substantially vary from country to country depending on their consumption patterns.

We employ the recently developed EUROMOD Indirect Tax Tool (ITTv4) to calculate the tax liabilities paid by households (VAT and excises) over the main types of energy products in each Member State based on incomes and the tax policy in place in 2019, and on consumption data from the EU Household Budget Survey 2015 (exc. Germany and IT, for which we used 2010). Differences in implicit tax rates over energy consumption across countries reflect differences in their tax systems as well as in their consumption patterns

Implicit tax rates over energy consumption in the EU, in 2019.



TYPE

concept
methodology
eu policy initiative
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LEVEL

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regional
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european

EU taxonomy for sustainable activities

PURPOSE Defining sustainable activities based on evidence-based criteria

USE Establishing the degree to which an investment is environmentally sustainable

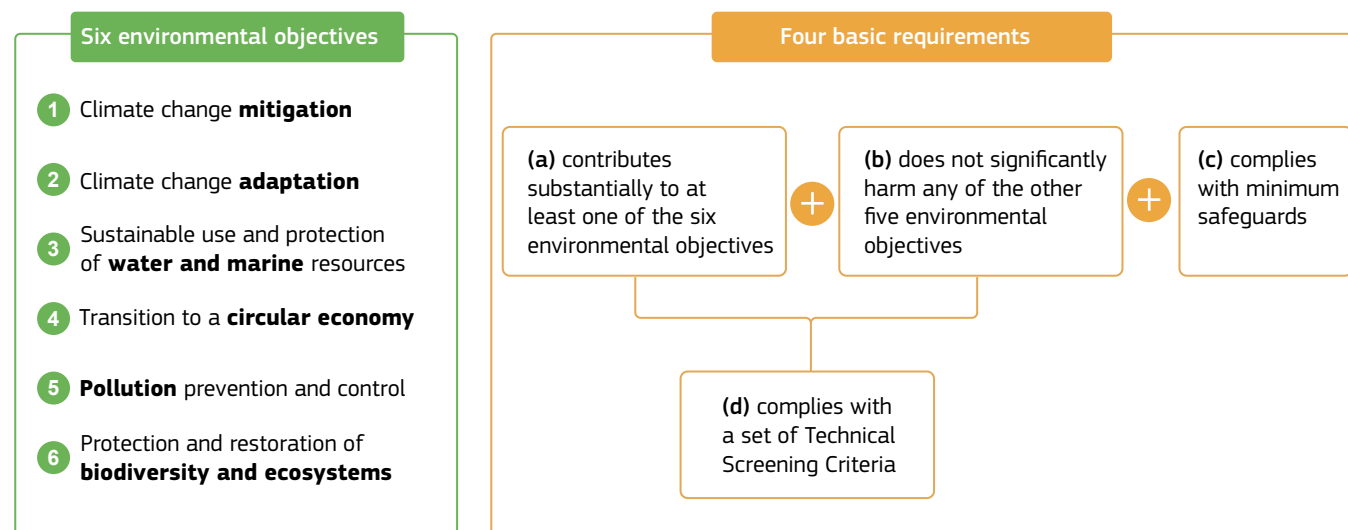
ACTIONBOOK ACTIVITIES **Mobilising resources**
Continuous monitoring

AUTHORS Isabelle Seigneur
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MORE → [EU taxonomy for sustainable activities](#)
→ [Platform on Sustainable Finance](#)
→ [Taxonomy Delegated Acts](#)

The EU taxonomy is a classification system establishing a list of environmentally sustainable economic activities. With this, the EU taxonomy aims to provide companies, investors and policymakers with a common language and a clear definition of what is 'sustainable'. A relevant element of the EU Taxonomy is its underlying concept of sustainability. The Taxonomy Regulation defines six environmental objectives and lays down that, to be qualified as environmentally sustainable, an activity shall fulfil four conditions (see figure below). The rationale behind this approach is that an environmentally

sustainable activity shall not only substantially contribute to one of the defined objectives: it shall also do no significant harm to the other ones. This framework is being further developed through specific Delegated Acts, which contain the Technical screening criteria for each environmental objective and for each economic activity. As reference, the Climate Delegated Acts cover approximately 90 economic activities that are responsible for nearly 80% of the direct Greenhouse Gas emissions in Europe.



TYPE

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methodology
eu policy initiative
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LEVEL

local
regional
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european

European Digital Innovation Hubs

PURPOSE Accelerating digital transformation of businesses and public sector

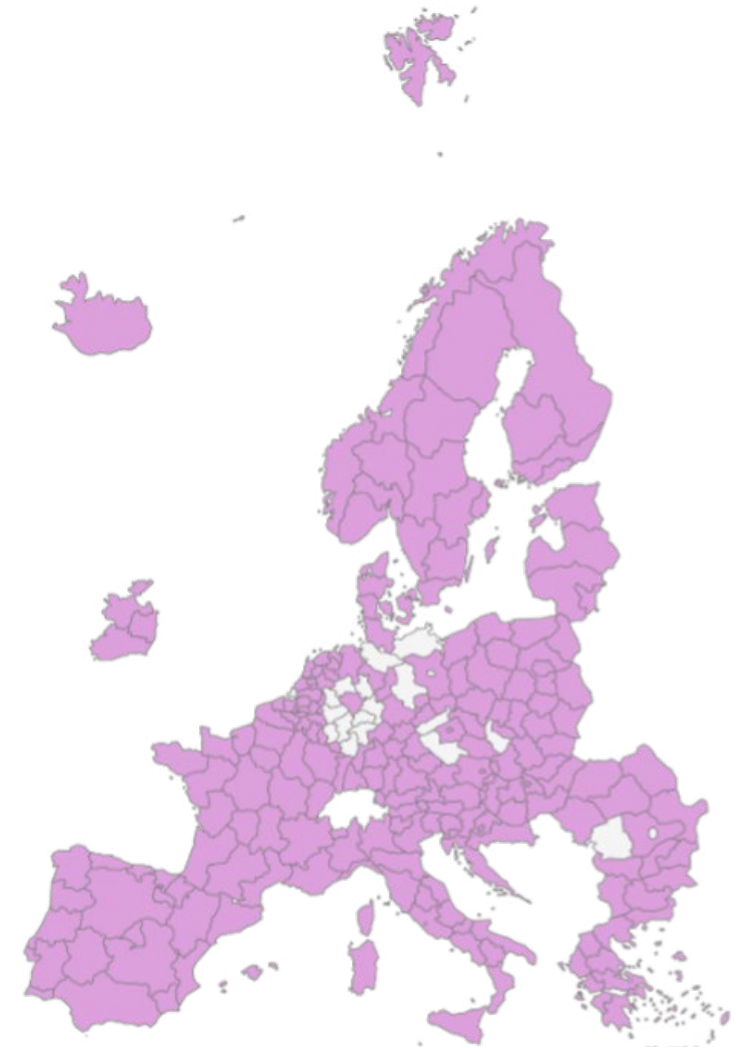
USE Providing cutting-edge digital technologies and expertise in every European region

ACTIONBOOK ACTIVITIES Continuously engaging with stakeholders
Deploying a strategy
Coordinating the policy and action mix

AUTHORS Sarah De Nigris, Annita Kalpaka, Johan Stake, Daniel Nepelski (daniel.nepelski@ec.europa.eu)

MORE → [European Digital Hubs Network – Digital Transformation Accelerator](#)
→ [Digital Strategy - European Digital Innovation Hubs](#)
→ [JRC – Digital Innovation](#)

Increased digitalisation is a key tool for addressing some of the major challenges that European businesses face. To this end, the Digital Europe Programme established a network of European Digital Innovation Hubs (EDIH). The initiative aims to encourage a wide participation of small and medium-sized enterprises (SMEs) from all geographical areas, including the EU outermost regions and other economically disadvantaged regions and various work strands serve this purpose. The EDIHs networks objective is to provide tailor-made digitalisation support to SMEs and public sector organisations in all regions and sectors of the EU to introduce new innovative production processes, new business models and upgraded innovative products and services. As of 2023, the EDIHs network comprehends 227 hubs. 85% of the European regions host organizations forming the EDIH network and EDIHs services are available in nearly 90% of the European regions. The EDIHs provide services in such key technologies as Artificial Intelligence, Cybersecurity and Internet of Things. The SMEs can reach out to EDIHs to receive digitalisation services such as test before invest, advanced digital skills, innovation and internationalisation support, support to find investments and more. The EDIHs interventions start by assessing the level of digital maturity of each SME or public sector organization that requires their services through a new Digital Maturity Assessment Tool developed by the JRC, with a view to measure the increase of digital maturity achieved after the EDIH intervention. The EDIHs exhibit properties of a pan-European network and have very strong research and innovation underpinnings. Majority of the participants are universities and research organizations strengthened by private companies from the digital sector.



Regional coverage of the European Digital Innovation Hubs network

TYPE

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methodology
eu policy initiative
example

LEVEL

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European Startup Village Forum

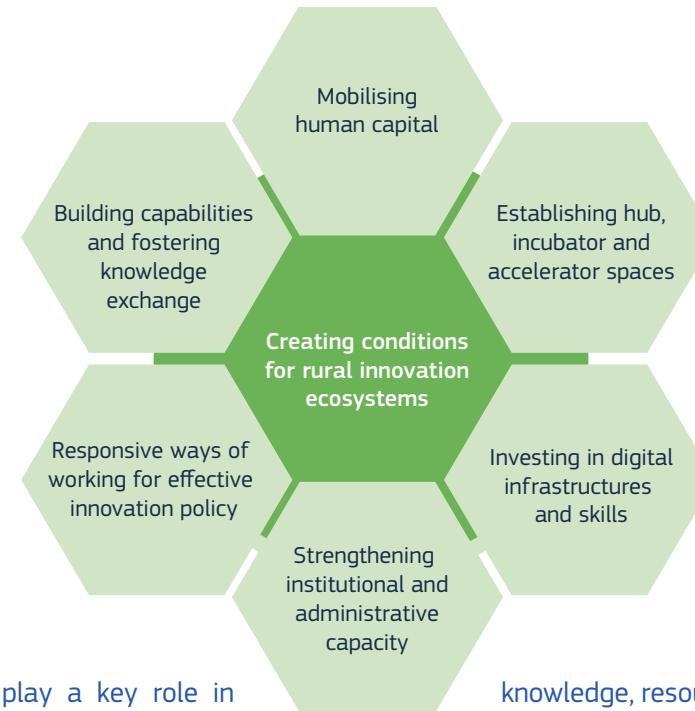
PURPOSE Strengthening innovation and entrepreneurial ecosystems in rural areas

USE Gaining a deeper understanding of the factors that drive innovation and entrepreneurship in rural areas

ACTIONBOOK ACTIVITIES *Designing ecosystem support*
Experimenting and demonstrating
Scaling and mainstreaming

AUTHORS Fernando Merida
Simone Sasso
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MORE → [Long-term vision for the EU's rural area](#)
→ [The European Start up village Forum](#)
→ [SVF Mapping tool](#)



Research and innovation play a key role in tackling challenges and reap opportunities for wellbeing and growth in rural territories. The European Startup Village Forum initiative aims to develop new evidence and gain a deeper understanding of the factors that drive innovation and entrepreneurship in rural areas, while facilitating the exchange of knowledge and expertise on how to promote startup-driven innovation in these areas. This initiative is part of the European Commission's Long-term Vision for the EU's Rural Areas. The vision identifies several areas of action towards stronger, connected, resilient and prosperous rural areas by 2040. It recognises the role of innovation to help tackle challenges and reap opportunities for wellbeing and growth in rural areas and includes a specific flagship action on research and innovation for rural communities. A startup village is a place (or a network of small places) that embraces innovation and ambitious entrepreneurship as a way to unlock development potential and support wellbeing in rural areas. By combining local place, people, and purpose with external

knowledge, resources, and markets, the Startup Village strives to provide favourable conditions for entrepreneurial and innovative ecosystems to flourish. The Startup Village Forum works as an open space where institutions and stakeholders can meet, discuss and shape actions and tools for supporting innovative entrepreneurship in rural areas. By bringing science-based and community-based knowledge and experiences together with high-level political traction, the Forum explores the different dimensions of rural innovation ecosystems and discusses insights on the challenges and potentials for entrepreneurial development in rural areas. Next to the yearly Forums, the initiative has been developing a mapping exercise to identify existing Startup Villages in the EU and their readiness degree, as well as a set of analytical studies to measure rural innovation and entrepreneurship and better understand the conditions that enable the development and strengthening of entrepreneurial and innovation ecosystems in rural areas.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Financing instruments and private finance blending

PURPOSE Facilitating access to finance

USE Obtaining capital and diversifying asset classes

ACTIONBOOK ACTIVITIES

- Developing the policy and action mix
- Mobilising resources
- Deploying a strategy
- Prioritising funds
- Scaling and mainstreaming

AUTHORS Solange Mifsud
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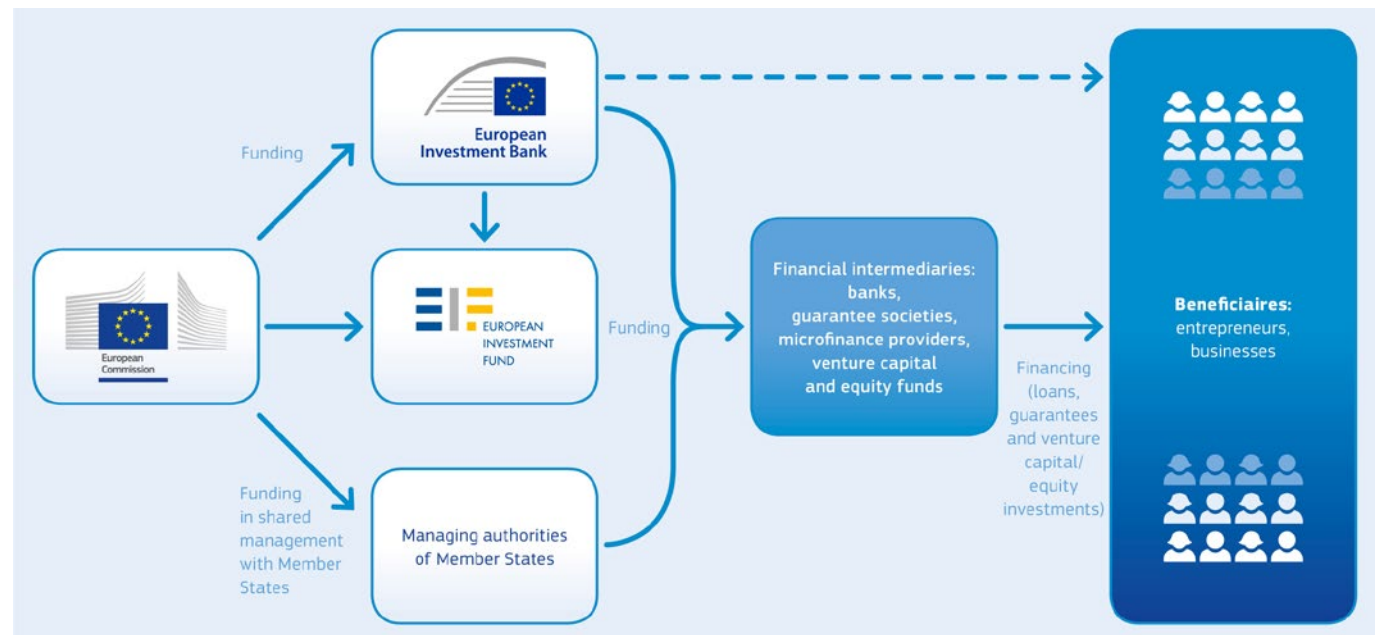
MORE

- [Financial instruments: equity, guarantees, and loans](#)
- [Blending public and private funds for sustainable development](#)

Blending different sources of financing provides sustainable funding strategies that accelerates social and economic development in regions and countries. There is a need to overcome the regulatory, organisational and attitudinal barriers in setting up synergies of different streams of financing at the national and territorial level. Hence, eliminate the fragmentation but enable the convergence in using EU Funds and blending techniques. Sometimes projects with potentially large benefits for society are not implemented due to lack of private incentives to attract the required financing. Financial engineering can help solve this market failure by modifying the risk-reward trade-off of such investments. Financial instruments can be engineered in different forms, namely equity and debt, loan guarantees and venture capital, and capacity building and risk sharing facilities. The European Investment Bank (EIB), which is the lending arm of the EU is responsible for 75% of the [InvestEU](#) pro-

gramme while the European Investment Fund (EIF) which is part of the EIB is key in enabling access to finance to SMEs through the [EIF's financial intermediaries](#) found in each EU Member State.

Financial instruments can also be combined with grants in [one single operation](#) under the shared management framework. This financing mix is primarily necessary where investments are not sufficient to generate adequate returns in order to make the project viable. Such funding combination can also be useful to stimulate investment demand, be ambitious in policy objectives and attract private financing. Blended finance plays a key role where the perceptions of risk refrain investment on purely commercial terms. Such financial set-ups connect target groups to the market making a project's capital base sustainable while incentivizing tapping into new or riskier potential markets.



Access to EU finance. Source: [EU funding](#).

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Financing sustainable instruments and green bonds

PURPOSE Ensuring public finance supports the green transition

USE Using sustainable financing instruments to steer the impacts of public finance

ACTIONBOOK ACTIVITIES
 Mobilising resources
 Deploying a strategy
 Prioritising funds

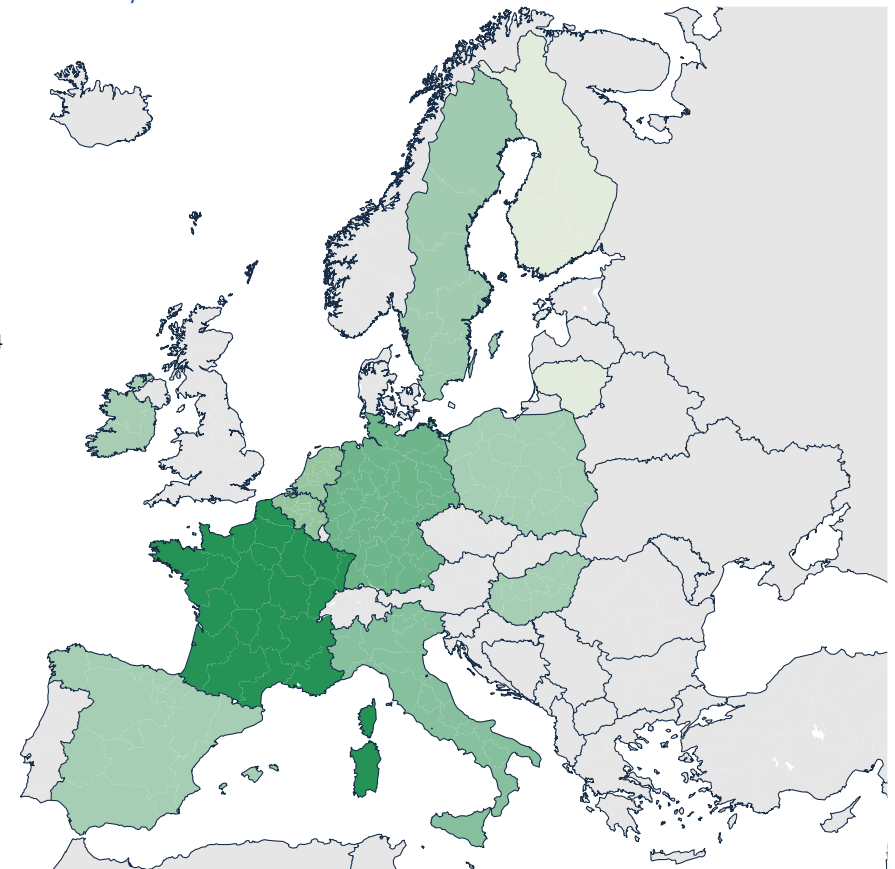
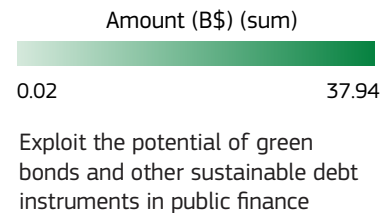
AUTHORS Solange Mifsud
(JRC-PRI-PILOT@ec.europa.eu)

MORE
 → [European Green Bonds: Council adopts new regulation to promote sustainable finance](#)
 → [Green bonds as a tool against climate change?](#)

Sustainable debt instruments play an increasingly important role in scaling up financing of investment for the green transition. As a type of fixed-income security issued to finance projects with positive environmental or climate effects, green bonds have emerged as the most successful and promising instrument of green finance so far. In October 2023, the Council adopted a Regulation to standardise a European green bond. It puts forward uniform requirements for issuance of bonds under the designation of a “European Green Bond” or “EuGB” for environmentally sustainable bonds. The EuGB is the first official EU standard for green bonds made available to investors globally and is based on a registration system and supervisory framework for external reviewers of European green bonds. The creation of this standard leads to easier comparability and more consistency that

benefit both issuers and investors of green bonds. An issuer interested in funding green projects adhering to the EU taxonomy can make use of this type of bonds, which gives more trust to investors that their investment is sustainable. The green bond issuance to finance up to 30% of the EUR 750 billion allocated for NGEU, and the European green bond standard are expected to accelerate market growth by stimulating further private and public issuances, and help respond to sustainability-concerned investors. There is evidence that governmental issuers can benefit from lower funding costs by issuing green bonds, while investors are not exposed to high downside risk during periods of financial market stress. Think about your territory. What is the percentage of financing instruments that is green/sustainable?

The use of green bonds in public finance.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Foresight

PURPOSE Using anticipation in policy design

USE Orienting regions towards opportunities emerging from the twin transitions

ACTIONBOOK ACTIVITIES
Diagnosing and developing a vision
Conducting participatory foresight
Developing transition pathways and roadmaps
Continuous monitoring

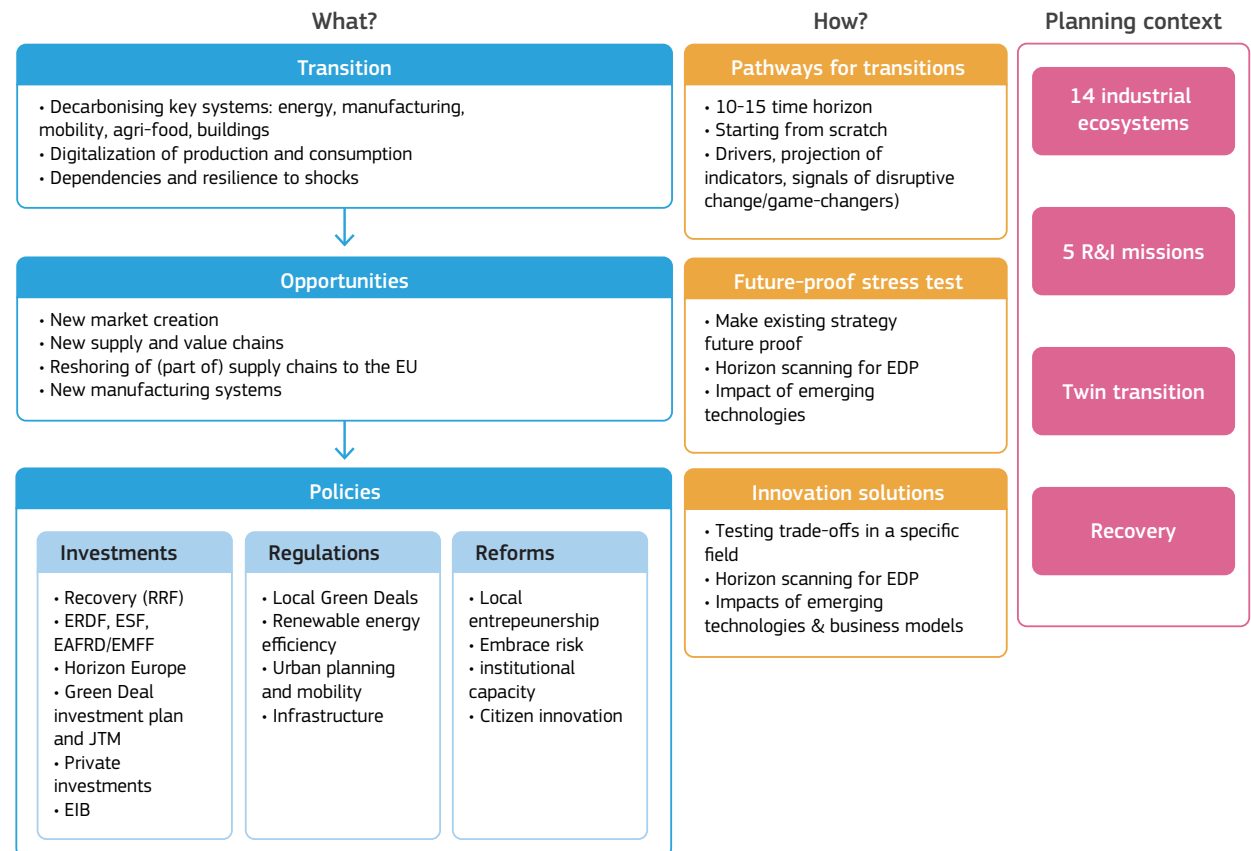
AUTHORS Karel Herman Haegeman
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MORE
→ [Foresight tools](#)
→ [Future technologies](#)
→ [National STI trends](#)

The twin transition requires paradigm shifts towards new value chains and systems. The recovery from the Covid-19 crisis aims at the same time to bring the EU closer to this transition, and to increase resilience of European territories for the unexpected. The needs for paradigm shifts, increased resilience and strategic autonomy requires EU territories to draw on collective anticipatory intelligence. The nature of the changes required also calls for different approaches to anticipation, and on combining both quantitative and qualitative knowledge and methods.

The PRI TOP-sight tool considers Transitions (green, digital, strategic autonomy), Opportunities (markets, value chains, industrial systems, reshoring of activities, etc.) and public Policies (national, regional, urban, local) to reap benefits for local jobs and value creation through PRI. It identifies opportunities for innovations emerging from the twin transition, primarily within the 14 industrial ecosystems. This tool allows you to draw opportunities from analysis of specific transitions, and translate them into policies regarding investments and strategies, regulations, and reforms.

TOP-SIGHT



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

GovTech

PURPOSE Bringing digital innovation to the public sector (through public procurement)

USE Transforming the public sector through the adoption of innovative digital technologies

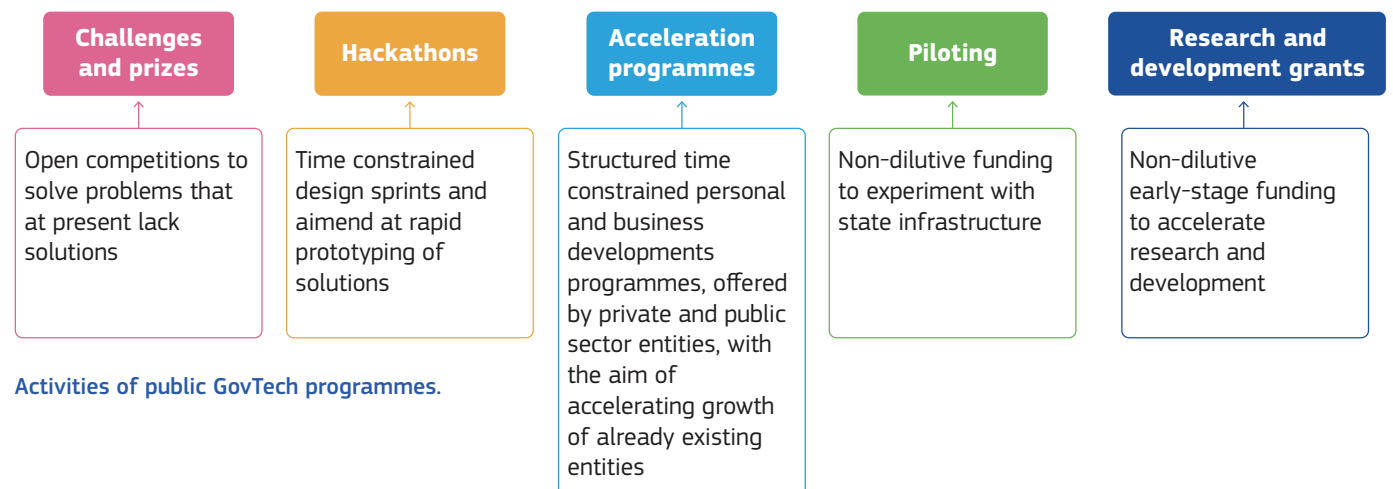
ACTIONBOOK ACTIVITIES
 Designing ecosystem support
 Experimenting and demonstrating
 Scaling and mainstreaming

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(JRC-Digital-Governance@ec.europa.eu)

MORE
 → [GovTech Practices in the EU](#)
 → [Scoping GovTech dynamics in the EU](#)
 → [Innovative public services](#)

Governments at all levels are facing a myriad of complex and interrelated challenges. These require governments to act and adapt quicker and be more effective than during non-turbulent times. How can digital technologies help public administrations effectively respond in dynamic, multilevel, multi-actors operating in interrelated ecosystems? Digital Technologies can help governments become more efficient, effective, pro-active, and inclusive while increasing the value they provide to the public, citizens and businesses, through their services. However, buying off-the-shelf digital solutions from established vendors is not always sufficient. Therefore, for the acquisition of innovative technologies through public procurement many governments are starting to investigate into GovTech practices. The term “GovTech” refers to governments working with start-ups and SMEs to develop and acquire innovative digital solutions. Amongst the distinct types of public procurement methodologies, adaptive Public Procurement of Innovation (PPI) models are those most suited to meet public administrations and their user needs. This is due to SMEs and start-ups partners offering the natural agile, adaptive ground and flexible practices to procure innovative digital solutions. This is critical when addressing interoperability (IOP), cross border operations, and contextu-

alization of national and EU regulations into local and regional contexts. Governments in the EU engage with GovTech because, in addition to creating innovative digital solutions to societal problems, this field promises to bring a new working culture to the public sector and foster innovation made in Europe. However, there are challenges faced by governments working with start-ups and SMEs, related to the structure of the market, complex and time-consuming procurement rules, and different working cultures between governments and GovTech companies. Yet, while being more agile, adaptive and innovative with respect to bigger companies in answering procurer needs (also for interoperability and contextualisation requirements), for small enterprises the costs for complying with procurement processes are highly impactful on their resources. It is therefore important to support the innovative processes and practices of both SMEs and Public Administrations, both to allow small enterprises to enter the market and allow public procurement processes of public administrations the necessary agility and sustainability of their ecosystems (e.g. continuity and coherence in the maintenance of public procurement systems). To address those challenges, governments across Europe have started setting up dedicated GovTech programmes.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Green public procurement

PURPOSE Using the purchasing power of government to achieve sustainability goals

USE Working across government in reconsidering public procurement procedures that create multiple value

ACTIONBOOK ACTIVITIES **Mobilising resources**
Deploying a strategy

AUTHORS Ramojus Reimeris
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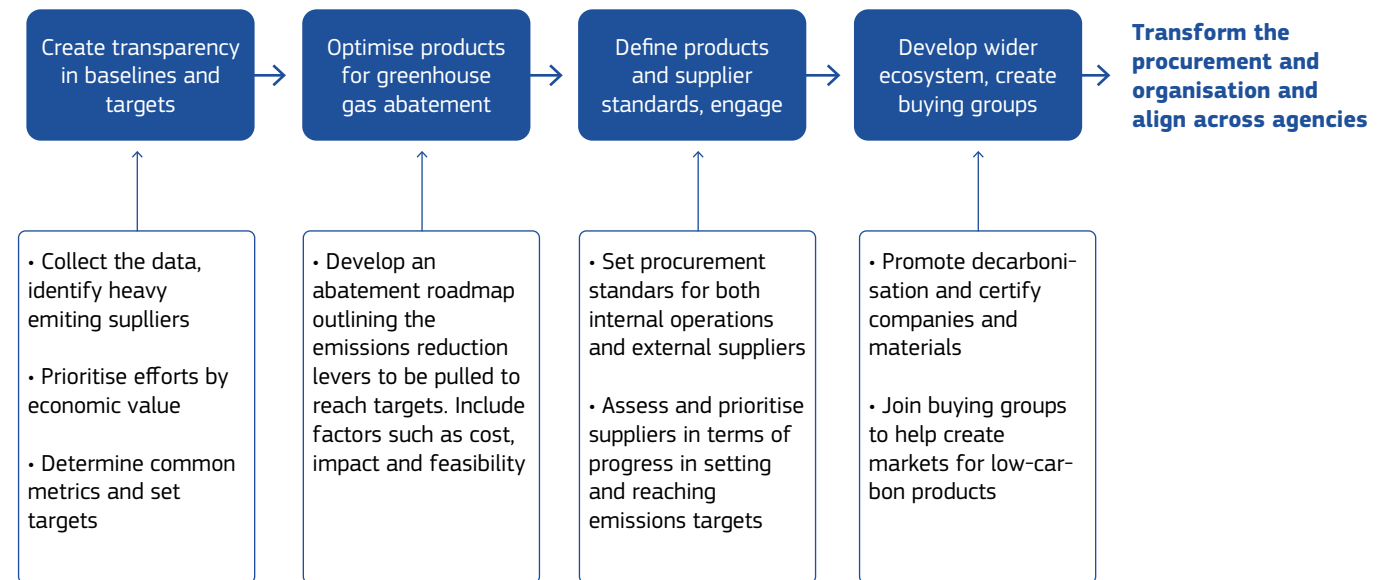
MORE → [WEF Green Public Procurement 2022.pdf \(weforum.org\)](#)
→ [Buying green handbook - Green Public Procurement - Environment - European Commission \(europa.eu\)](#)

Governments, by using their purchasing power to choose goods, services and works with a reduced environmental impact, can make an important contribution towards local, regional, national and international sustainability goals. Countries increasingly recognise that Green public procurement (GPP) can be a major driver for innovation, providing industry with incentives for developing environment-friendly works, products and services. However there are obstacles to successfully implementing GPP, including in particular: the perception that green

products and services may be more expensive than conventional ones; public officials' lack of technical knowledge on integrating environmental standards in the procurement process; the absence of monitoring mechanisms to evaluate if GPP achieves its goals.

- Have you already made use of GPP?
- What are the real or potential obstacles you face when/if implementing GPP?

Below, you can find a series of common obstacles and how you can overcome them.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Identifying local challenges

PURPOSE Identifying and solving local problems collaboratively

USE Breaking policy framing into smaller steps

ACTIONBOOK ACTIVITIES Developing transition pathways and roadmaps
Setting milestones and targets
Developing a strategy
Designing local missions

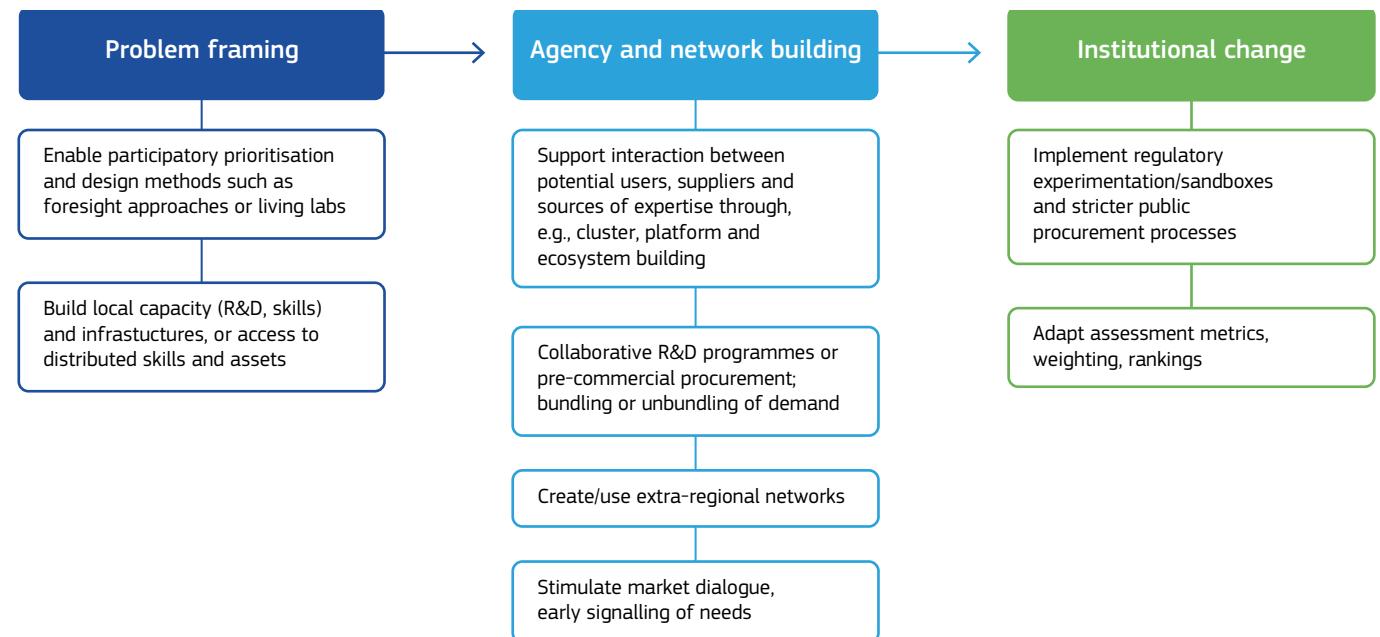
AUTHORS Guia Bianchi
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MORE → [Towards a problem-oriented regional industrial policy: possibilities for public intervention in framing, valuation and market formation](#)

Try and think about local problems as being more than market failures. Instead, they represent opportunities where through innovation, you and your stakeholder network can build a more sustainable territory, while creating multiple value for the local community and its economic development. Innovation policies need to be designed around a close understanding of the local context and those mostly affected by them. It is key to engage local decision makers, networks and institutional entrepreneurs as they have knowledge of the problem,

shared values, and the willingness to co-create locally-tailored solutions. This will generate access to resources, legitimacy, and solutions to local problems. This way market creation is enabled through shared visions of local problems shaped by local stakeholders (problem framing), their interactions and sense of ownership towards building solutions (agency and network building), and the active involvement of institutions (institutional change). You can take a look at the steps below.

Market formation: possible areas for public intervention. Source: adapted from Flanagan et al., 2023



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Industrial transition pathways

PURPOSE Implementing and coordinating industrial transition pathways

USE Helping public and private groups to build territorial transition pathways

ACTIONBOOK ACTIVITIES

- Diagnosing and developing a vision
- Developing transition pathways and roadmaps
- Designing ecosystem support
- Deploying a strategy

AUTHORS Carmen Sillero Illanes
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MORE → [Transition pathway for tourism](#)

Transitions in territories should go hand in hand with transitions at EU level. The European Industrial Strategy is developing, for accelerating the digital and green transition and securing the European open strategic autonomy, the co-creation of transition pathways for 14 European industrial ecosystems. Transformative innovation processes at territorial level need to be aligned with transitions planned at systems level in Europe. Connecting well territories and their transition strategies to the EU system-level transition pathways is crucial for a coordinated approach in transforming EU's in-

dustrial ecosystems towards sustainability. Additionally, territories can integrate the place-based perspective in the transition of European industrial ecosystems and help involve a diversity of players across Europe in the transition of EU systems. This way, territories can be a bridge between European value chains and local decision-makers in their territory. Clusters can be a good bridge for such connections. The figure below indicates initiatives and financing opportunities for better coordination between territories and European value chains in implementing the twin transition

Building blocks for increasing coordination between places and EU industrial ecosystems

Initiatives for coordinating territorial and European systems transformation	Examples of additional initiatives for financing coordination
<p>Euroclusters or Join Clusters Initiatives</p> <ul style="list-style-type: none"> Support the implementation of the industrial strategy 1 Eurocluster for each industrial ecosystem and 16 horizontal Euroclusters. 	<p>Interregional Innovation Investments (I3)</p> <p>Funds mature joint innovation projects and supports S3 stakeholders in specific value chains.</p>
<p>Industrial Alliances</p> <p>Facilitate stronger cooperation between a wide range of public and private partners in a given value chain (incl. civil society).</p>	<p>Important Project of Common European Interest (IPCEI)</p> <p>State-aided larg-scale projects which address major market failures of significant benefits to the Union and its citizens, bringing together knowledge expertise, financial resources and economic actors from across the union.</p>
<p>Interregional S3 Partnerships</p> <p>Connect EU regions around thematic areas of smart specialisation.</p>	<p>Interreg Europe</p> <p>Cooperation instrument for public actors. Could be used for mapping multilevel gaps and for defining new policy instruments for involving territories in the transition process.</p>
<p>European Partnerships</p> <p>Bring together EC and private and public partners around selected R&I initiatives</p>	<p>European Innovation Ecosystems (EIE)</p> <p>Funds cooperation among national, regional and local actors and supports connecting innovation ecosystems and upscaling companies.</p>
<p>Connected Regional Innovation Valleys</p> <p>Cooperation among Regional Innovation Valleys in thematic areas, focusing on reducing reliance on the fossil fuels, increasing global food security, mastering the digital transformation (including cybersecurity), improving healthcare, and achieving circularity.</p>	

T29

TYPEconcept
methodology
eu policy initiative
example**LEVEL**local
regional
national
european

Industry 5.0 Community of Practice (CoP 5.0)

PURPOSE Accelerating implementation of human-centricity, sustainability and resilience (Industry 5.0 principles) in practice

USE Promoting and applying Industry 5.0 principles and practices

ACTIONBOOK ACTIVITIES Continuously engaging with stakeholders
Setting up a network governance
Learning from experimentation

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MORE → [Industry 5.0 \(europa.eu\)](https://industry5.0.europa.eu)



Industry 5.0 provides a vision of industry that aims beyond efficiency and productivity as the sole goals, and reinforces the role and the contribution of industry to society. It places the wellbeing of the worker at the centre of the production process and uses new technologies to provide prosperity beyond jobs and growth while respecting the production limits of the planet. It places research and innovation at the service of the transition to a sustainable, human-centric and resilient European industry. During the pilot phase (November 2023 – June 2024), CoP 5.0 will conduct an in-depth analysis focused on examining the application of the concept of learning ecosystems which are agile and future-oriented environments equipped to lead the digital and green transition with a focus on human-centricity, resilience and sustainability. It will elaborate on different dimensions, such as understanding the role of industry 5.0 in building and co-shaping learning ecosystems via learn-

ing organisation model, understanding enabling factors for learning ecosystems, making synergies with existing EU policies. CoP 5.0 will co-develop a prototype Industry 5.0 assessment tool. This qualitative tool will be designed to help companies and organizations evaluate their Industry 5.0 performance based on three critical pillars: human-centricity, resilience, and sustainability. The co-development phase will be followed by a prototype validation phase. The tool could potentially contribute to the future Industry 5.0 Key Performance Indicator (KPI) development. In parallel with the above-mentioned two work-streams, CoP 5.0 will compile a comprehensive inventory of Industry 5.0 pilot projects and actions, including from EU funded projects, or independently organised activities like company peer groups, cross-organizational learning, value chain intelligence approaches etc. This inventory will serve as a valuable resource for mapping the Industry 5.0 landscape in Europe.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Innovation councils

PURPOSE Ensuring innovation policy coordination and stakeholder engagement

USE Collectively making long-term choices

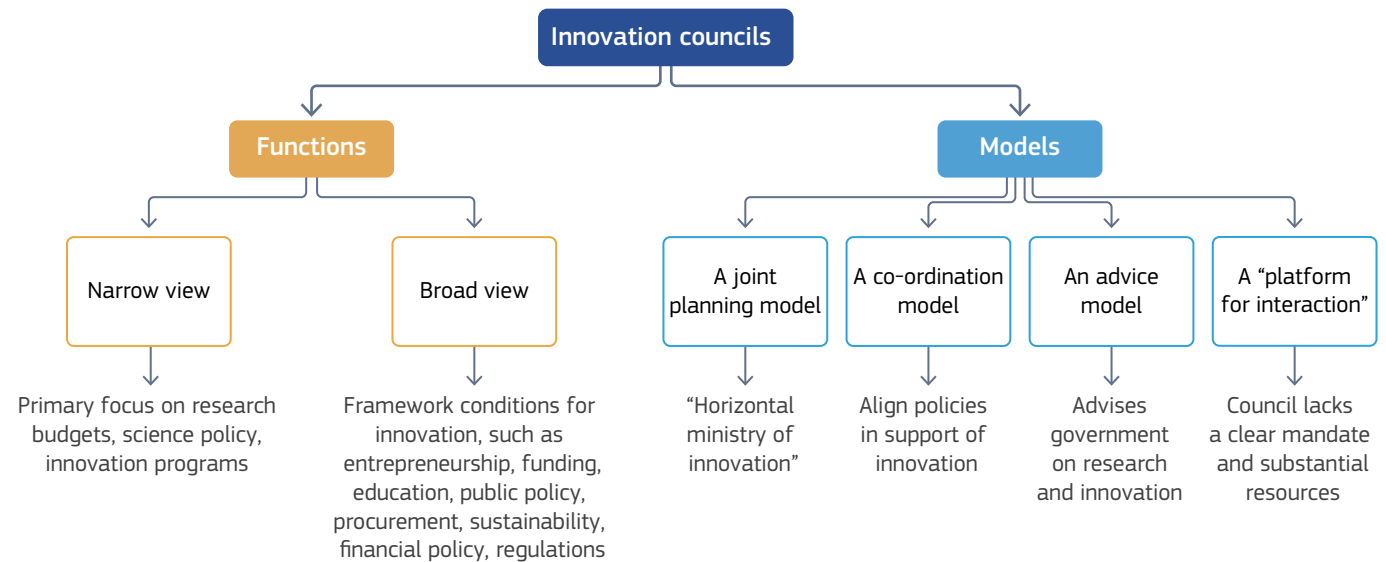
ACTIONBOOK ACTIVITIES Continuously engaging with stakeholders
Building legitimacy
Mobilising resources

AUTHORS Dimitrios Pontikakis
(JRC-PRI-PILOT@ec.europa.eu)

MORE → [National Research and Innovation Councils as an Instrument of Innovation Governance - Characteristics and challenges](#)
→ [How is research policy across the OECD organised? : Insights from a new policy database | OECD Science, Technology and Industry Policy Papers | OECD iLibrary](#)

Clear goals and strong coordination among public and private stakeholder groups are required to direct innovation capacities towards meeting societal challenges and play a central role in transitioning to a more sustainable economy and society. Innovation (or research and innovation) councils are widespread institutions with plurality in their composition and a certain degree of independence and detachment from the electoral cycle. Innovation councils can provide advice, coordinate, allocate funding, monitor, evaluate and do foresight.

Therefore, an innovation council needs political endorsement and support to have a meaningful role; resources to keep the momentum (secretariat), prepare and have the strategic intelligence (data, studies) to provide evidence-based guidance; have a sense of urgency, a common purpose and ambition. Such councils can help align different levels of government for long-term commitments and ensure reflexivity and the resilience of collective efforts towards long-term societal wellbeing.



Functions and models of innovation councils.

Source: based on Schwaag (2021) and Schwaag et al. (2015)

T31

TYPEconcept
methodology
eu policy initiative
example**LEVEL**local
regional
national
european

Innovation policies for affordability

PURPOSE	Making innovations more affordable to promote greater access, impact and capability
USE	Developing policy mixes that lower cost and accelerate the diffusion of sustainability solutions
ACTIONBOOK ACTIVITIES	Mobilising resources Scaling and mainstreaming
AUTHORS	Dimitrios Pontikakis (JRC-PRI-PILOT@ec.europa.eu)
MORE	→ Frugal innovation

Many innovations for sustainability such as heat pumps, EVs, green hydrogen, stationary battery storage, are still prohibitively expensive, preventing their widespread diffusion. Although prices tend to drop over time as these solutions are manufactured to scale, the radical price reductions necessary for the widespread adoption implicit in Europe's ambitious goals will require much additional innovation to develop more affordable solutions. Historical experience suggests that public policy can play a key role in accelerating their development.

Why are innovation policies for affordability necessary?

High-technology markets characterised by large-scale R&D and monopolistic competition can take a long time to cater to majority adopters. Early adopters are prepared to pay a high price premium which is necessary to offset the high costs of R&D. For this reason solutions tend to cater to the needs of early adopters first. However, early adopters typically account for a very small share of the potential market. More widespread diffusion usually requires the development of technological prototypes that are adapted to the means and needs of the majority of potential adopters. It often takes new entrants to identify majority adopter needs and adapt technological solutions accordingly (see some real-world examples in the box below). Real-world examples point to what may well be a more general tendency for the initial persistence of solutions offering continuously improved technology capability for a constant high price. Mass adoption however may rather depend on the development of progressively lower priced solution prototypes that offer a mostly fixed bundle of technological capability that is sufficient for the majority of use cases. The trigger for these solutions to emerge does not usually come from an incumbent, can sometimes be traced outside the market, and can include publicly-supported and non-profit initiatives.

How innovations by new entrants, publicly-supported and non-profit initiatives helped make key technologies more affordable.

Many of the technologies entering widespread use in recent years were already in limited use many decades ago but had to wait for suitably adjusted technological prototypes before they could become affordable. For instance, it took the introduction of personal computers to bring graphical user interfaces and networks out of the niches in which they emerged in the 1960s and into widespread use by the turn of the century. Because mass-market prototypes require an intimate understanding of use cases, some of the innovations that opened the path to mass adoption were not initially driven by market considerations. Some were pioneered by non-profit organisations (e.g. MIT's "one laptop per child" initiative demonstrated untapped demand for low-cost laptops that triggered the development of much more affordable portable computers known as 'netbooks'), whereas others have their roots in user innovation and draw on prosumer knowledge (such as the Raspberry-Pi inexpensive computer board initially designed to educate students on hardware-level programming but now used extensively in low cost computing applications). Solar photovoltaic is another telling example, with its initial application in small niches (such as the US space programme) going as far back as the 1960s. Driven by demand of niche uses, the thrust of technological development in the early years aimed at increasing photovoltaic panel efficiency rather than reducing price. It took government subsidies aimed at promoting mass adoption to promote massive cost cuts that accelerated take up, especially over the past decade.

What is the role of public policy?

In this context public policy has a role to support a greater pool of firms to innovate with the ultimate aim of providing affordable solutions for the majority of users. Some possibilities include:

- **Collective provision of sustainable solutions** makes sense where there are clear benefits from procuring and delivering solutions at scale: examples include sustainable mass transport, ride-sharing, promotion of pay-per-use sustainable vehicle business models, municipal heating, some forms of energy storage, etc. Whereas governments often support such services, the support does not normally have an innovation objective. However collective provision can open up otherwise unavailable **innovation spaces**, availing precious early opportunities for local companies to gauge demand, experiment with prototypes and understand complex behavioural and regulatory interactions. However, introducing innovation spaces in public subsidies, public investments and public procurement requires building provisions for innovation into the design of their technical specifications, earmarking a budget for experimentation. The collec-

tive provision of sustainable solutions can also raise awareness about not only the environmental benefits of some of the solutions but in many cases their other superior performance characteristics (e.g. reduced noise pollution, ride comfort, and increased safety for electric vehicles, reduction in overall waste due to home composting and recycling etc.) that in turn promote private adoption of sustainable solutions.

- **Public support for innovation that develops more affordable sustainable product and service prototypes** can be a crucial role of public policy in cases where additional innovation is necessary before mass-market prototypes emerge or are suitably adapted to local circumstances. This can take the form of public research for more affordable solutions, specific support for new entrants (startups or FDI), regulatory sandboxes, horizontal business innovation support subsidies or small sum innovation vouchers for so-called **frugal innovation**, which are also made available to small companies, repair workshops, citizen scientists and prosumers. Combining the objective of affordability with adaptation to **local needs** (e.g. last-mile sustainable logistics), may also provide a pathway for the development of unique technolog-

ical niches (e.g. place-based sustainable housing and transport, renewable energy and storage solutions or solutions linked to other production uses such as suitably adapted agrivoltaics, desalination plants, environmental remediation technologies).

- **Public support for mass manufacturing / service provision** may make sense in cases where mass-market prototypes already exist and the bottleneck is in unit-cost reductions. Public policy can support those investments that allow mass manufacturing (e.g. gigafactories for batteries) or service provision (e.g. digital solutions that improve access, adaptation to the needs of social groups that face digital barriers). These investments can be risky and require a fertile business ecosystem.
- **Systemic interventions** such as the provision of complementary industrial services, competition-enhancing measures (e.g. in the energy market) or support to investments (e.g. combined investments in renewables and energy storage) that reduce the prices of crucial factor inputs (e.g. the provision of relevant skills, access to scarce raw materials) could be another path.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Innovation portfolios

PURPOSE Exploring and converting strategic priorities and objectives into transformative investment

USE Mapping innovation activities to guide strategic decision-making and support evaluation processes

ACTIONBOOK ACTIVITIES

- Setting up a network governance
- Enabling multilevel cooperation
- Collaborating across departments
- Mobilising resources
- Designing local missions
- Coordinating the policy and action mix

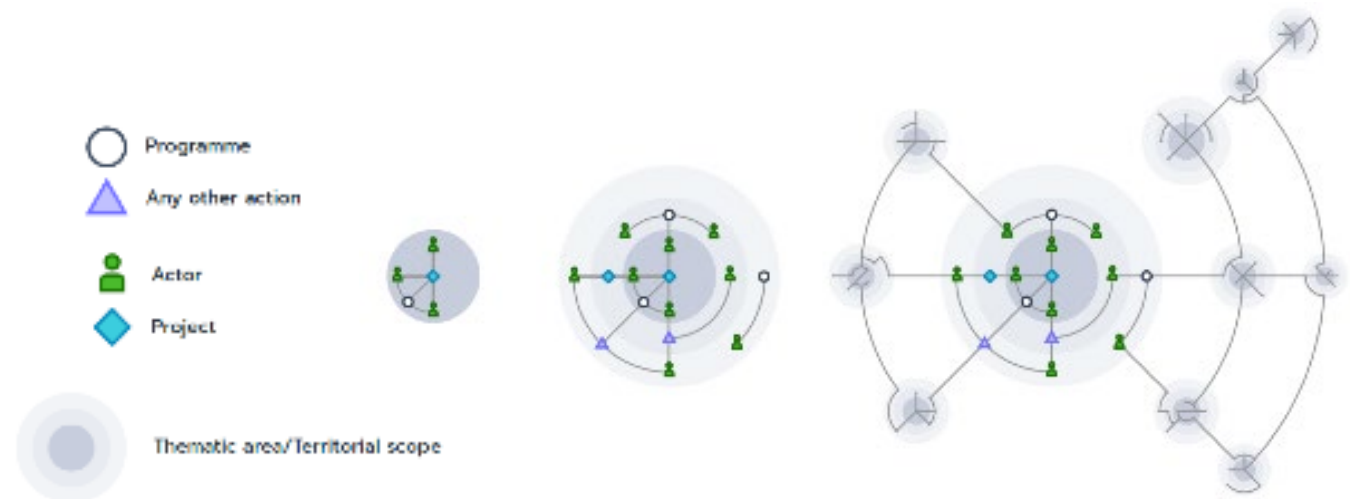
AUTHORS Cristian Matti, Carla Alvial-Palavicino, Christoph Brodrik
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MORE

- [MOTION handbook. Developing a transformative theory of change](#)
- [System Change: A Guidebook](#)
- [Webinar on innovation portfolios](#)
- [Tackling Policy Challenges Through Public Sector Innovation](#)

Innovation portfolios represent constantly evolving frameworks in which projects, programmes and initiatives create links to interrelated policies and foster new strategic relationships across sectors, locations and levels of government. This perspective on portfolios facilitates multi-stakeholder collaboration to identify and exploit synergies between projects, programmes and different policy frameworks. The approach contributes to multiple innovation activities by enabling continuous interactions between actors, resource flows and opportunities. Innovation portfolio management provides a structured framework to turn initial concepts and prototypes into tangible investment opportunities. This process brings to light potential synergies that align with the current strengths of the targeted system. In addition, the framework helps design transformative innovation policy instruments to address critical societal challenges. It shows how a portfolio of innovation programmes and projects plays a crucial role in performing systemic brokering functions by strengthening complementarities between interventions at different system

levels and maximising the benefits of public research and innovation investments to support systemic change. Research and innovation agencies often use portfolios to coordinate an investment architecture for systemic transformation projects across different programmes. These programmes address multidimensional aspects of innovation systems and focus on different phases of the innovation process — from idea generation and prototyping to the advanced phase of demonstrating products, services and business models. Portfolios also serve as a tool to facilitate monitoring, evaluation and learning of systemic change through a programmatic logic. They help programme managers face the challenge of simultaneously orchestrating multiple programmes and lines of action by highlighting some complex aspects of systemic dynamics such as 1) purpose and alignment reflected in the goals/vision behind the investment strategy, 2) resilience related to network building and governance and 3) diversity encompassing multiple themes and sub-themes, actors and locations.



Source: Alvial-Palavicino et al (2021)

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Innovation Procurement

PURPOSE Using public procurement strategies for enabling the development of new and innovative solutions

USE Driving demand side innovation addressing public challenges and needs and creating opportunities for companies

ACTIONBOOK ACTIVITIES

- Enabling multilevel cooperation
- Collaborating across departments
- Developing a strategy
- Mobilising resources
- Deploying a strategy
- Scaling and mainstreaming

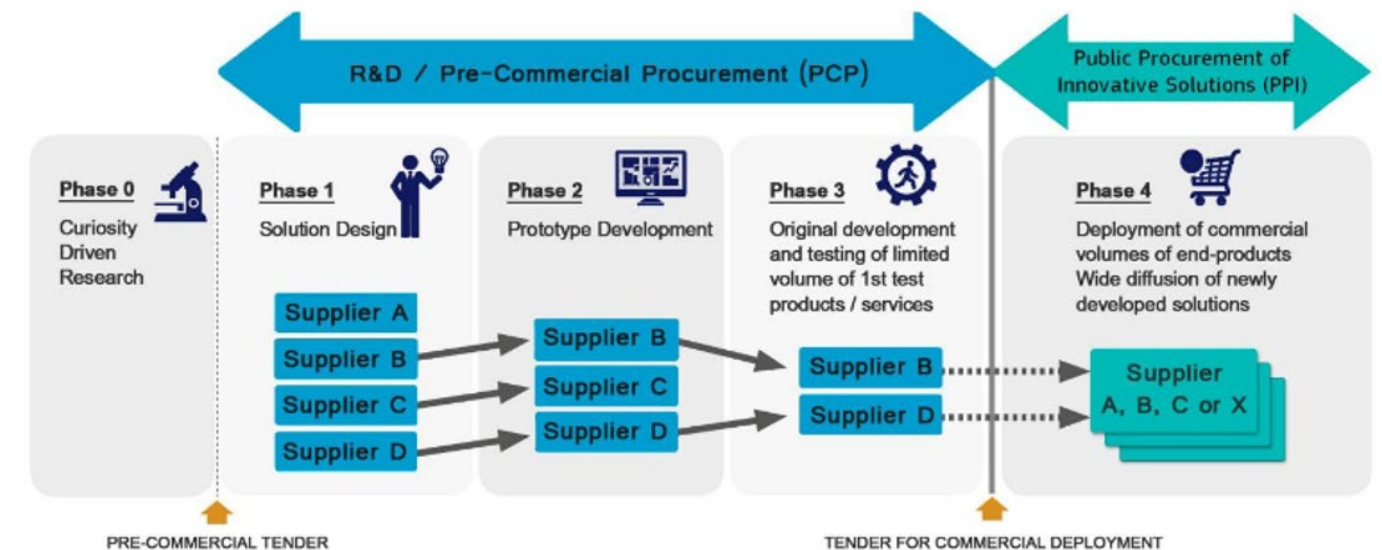
AUTHORS Carmen Sillero Illanes
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MORE

- [European Assistance For Innovation Procurement](#)
- [EAFIP toolkit](#)
- [Innovative public procurement for implementation of RIS3](#)

The public sector plays a significant role in various domains such as mobility, health, construction, e-government, waste management, and recycling. Within these areas, there is often a need for new and innovative solutions to improve the functioning of public organizations. This need can arise from identifying pressing issues within the organization itself, such as the need to control forest fires, or from policy decisions like the Green Deal that requires the public sector to reduce CO2 emissions. These challenges often require solutions that do not yet exist as commercially proven products. In such cases, the public sector can act as the first buyer, signaling market acceptance and encouraging the development of innovative solutions, being at the same time a powerful tool for supporting start-ups, by proactively engaging in innovation procurement, the government

can drive the creation of new products and services that address these pressing needs. When developing an innovation procurement action plan, it is beneficial to align the procurement needs with specific local or regional challenges or priorities. This ensures that the solutions sought after through procurement initiatives are in line with the strategy to be undertaken by the city or region. When the challenges faced required innovation solutions already available in the market, we refer to Public Procurement for Innovation Solutions (PPI). When there are no solutions near to the market, Pre-Commercial Procurement (PCP) facilitates the step but step process that include solution design, prototyping and initial production testing. This approach helps de-risk and refine the most promising innovation along the way.



Overview of a phased pre-commercial procurement process

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Interoperable Europe

PURPOSE Increasing public administration efficiency, and better cross-border and -sector public services

USE Developing interoperable by-design public services, and policies

ACTIONBOOK ACTIVITIES Continuously engaging with stakeholders
Collaborating across departments
Collaborating across territories
Coordinating the policy and action mix
Managing and transforming knowledge

AUTHORS Andrea Halmos, Alina Brebenel, Sven Schade
(JRC-Digital-Governance@ec.europa.eu)

MORE → [Monitoring Hub -NIFO](#)
→ [Connecting the EIF with Smart Cities & Communities \(EIF4SCC\) - NIFO](#)

Interoperability facilitates legal, organisational, semantic and technical alignment, as recommended by the European Interoperability Framework (EIF) to achieve more convenient digital public services. The communication from the Commission '[2030 Digital Compass: the European way for the Digital Decade](#)' underlines the need to speed up the digitalisation of public services by 2030, including by ensuring interoperability across different levels of government and domains. The [Interoperable Europe Act](#) introduces a new paradigm, setting the ground for digital public services conveniently accessible to any citizen without discrimination in the EU, by creating a structured cooperation framework on cross-border interoperability amongst Member States. Cross-border interoperability is enabled by both centralised national infrastructures, as well as, through decentralised systems that entail data exchange between local or regional administrations across Member States. Advancing public sector interoperability, therefore, requires the active involvement of administrations at the local and regional level, as well. In addition to the Interoperable Europe Board (reuniting representatives from Member States) the Act provides for the set-up of the Interoperable Europe Community, a community of public and private stakeholders (including representatives of public authorities at local and regional level) as well as civil society organisations and academic contributors. The Interoperable Europe Community could contribute to the Interoperable Europe Portal and participate in working groups that the Interoperable Europe Board may set up to examine specific points of its strategic agenda. The Interoperable Europe Portal will become a knowledge hub for public administrations to implement interoperable digital public services: it will include online training courses, access to innovative use cases, country knowledge and reusable interoperability solutions. To help national and regional administrations to achieve interoperability and contribute to the successful implementation of the Interoperable Europe Act, the Commis-

sion is going to further develop its trainings and learning materials under the Interoperable Europe Academy and further open the Academy to those levels of the governments most in need of training and peer-to-peer learning. To this end, new modalities to disseminate knowledge and encourage peer-to-peer learning will be implemented and particular attention will be paid to the principle of multi-linguality. [Public Sector Tech Watch](#) provides examples, where public administrations have used emerging technologies such as AI or blockchain, while the GovTech Connect community helps collaboration between the public and private sector, for the creation of re-usable solutions with the specific goal to foster innovation and encourage efficiency and uptake of tried fixes to foregrounding issues. The Interoperable Europe Act opens the possibility to understand the impact of underlying policies for the implementation of such solutions through setting up regulatory sandboxes. The Commission is also promoting the EIF for [smart cities and communities](#), a sectorial Interoperability Framework for local and regional administrations and makes available re-usable solutions such as [Reference Architectures](#), [semantic interoperability solutions](#) and [test-beds](#) that can help put in place interoperable public services and related datasets. The [SEMIC Support Centre](#) is particularly helpful when establishing data spaces or interconnecting them. The [JoinUp platform](#) hosts these solutions and will give access to a variety of additional re-usable, interoperable solutions in future. The portal also hosts information about how Member States are doing in their digital government transformation journey, how they align with the EIF and in future will also host information gathered as part of the obligations of the Interoperable Europe Act. While the [Living-in.eu community](#) focuses on the digital transformation of local and regional administrations, the Interoperable Europe Portal helps connecting different levels of government and allows them to reap the benefits of digital transformation in a new cross-border paradigm.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Joint calls

PURPOSE Helping align various calls for proposals and ensuring complementarities by design

USE Setting up transnational partnerships

ACTIONBOOK ACTIVITIES

- Agenda setting and sharing
- Enabling multilevel cooperation
- Collaborating across departments
- Collaborating across territories
- Prioritising funds

AUTHORS Solange Mifsud
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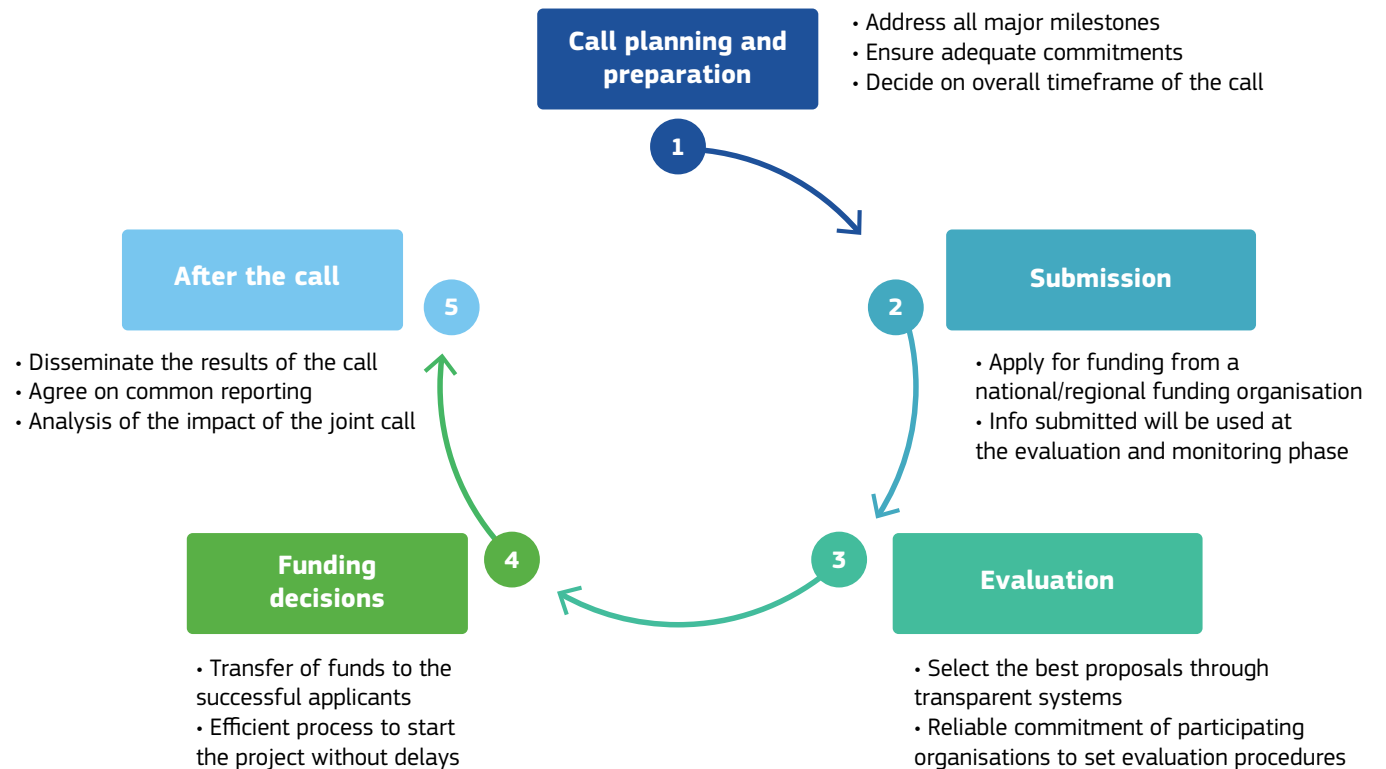
MORE

- [Joint Undertakings: analysis of collaboration mechanisms with ESI Funds in an S3 context](#)
- [An assessment of the impact of the FP7 ERA-NET scheme on organisations and research systems](#)

Joint calls generated by private-public partnerships display active networks leading to opportunities to create new forms of sustainable cooperation and funding arrangements. These help mobilise multiple R&I stakeholders at Member State and regional levels. Usually industry-led partnerships behind joint calls carry particular characteristics. They feature a governance structure based on critical mass from the private sector and tend to have strong links with national and regional levels. They generally develop their research agenda within

the EU's relevant policies leading to closer ties with regional and national initiatives. Then, they involve key stakeholders, part of international value chains, that could be of strategic importance to respective Member States and regions. In this manner, they, would be able to have access to a broad scientific community in relation to advanced technologies.

You can follow these key steps below to implement transnational calls for proposals, developed by the ERA-LEARN platform.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

JRC tools for sustainable urban development

PURPOSE Providing tools for strategies for sustainable development

USE Designing and implementing a strategy for sustainable development

ACTIONBOOK ACTIVITIES
Designing local missions
 Experimenting and demonstrating
 Learning from experimentation
 Mobilising competences

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 Pier Paolo Saraceno
 Carlotta Fioretti
 Martina Pertoldi
 Fabrizio Guzzo

MORE
 → [STRAT- Board](#)
 → [Handbook of sustainable urban development strategies](#)
 → [SAT4SUD - Self-assessment tool for sustainable urban development strategies](#)

Cities, alongside regions, can play a pivotal role in achieving the SDGs. The ‘urban dimension’ of EU policies has grown over recent years. During the 2014-2020 programming period, cohesion policy has made sustainable urban development (SUD) strategies compulsory, and their relevance has been even strengthened in 2021-27. Strategies in urban areas should apply an integrated and place-based approach, with emphasis on multi-sectoral policy, multilevel and multi-stakeholder governance, and promoting multi-territorial and community-led processes.

The Urban Agenda for the EU (2016) explicitly mentions the need for sound and strategic urban planning linked with smart specialisation strategies. SUD strategies can cover a variety of activities that could help implementing innovation policies at local level, directly including

R&I in their portfolio or investing in complementary policy areas such as education, training, infrastructures and entrepreneurship.

JRC provides methodological support to cities, managing authorities and other stakeholders involved in the design and implementation of SUD strategies. There are six building blocks that operationalise the EU integrated approach to sustainable urban development: strategic dimension, territorial focus, governance, cross-sectoral integration, funding and finance, and monitoring. To build synergies between innovation policy and cohesion policy, these six building blocks are meant to be used in the scope of the Cities mission when preparing and executing integrated climate neutrality plans to support climate neutrality in an integrated and sustainable way (RTD, 2021, [Info Kit for Cities – Cities mission](#)).



STRAT-Board

Online interactive tool by the JRC and DG REGIO under the umbrella of the Knowledge Centre for Territorial Policies (KCTP). It aims to provide a continuously updated state of play on how the European Structural and Investments Funds (ESIF) support the integrated approach to urban and territorial development.



Handbook of Sustainable Urban Development Strategies

This handbook provides methodological support to cities, Managing Authorities and other stakeholders involved in the design and implementation of sustainable urban development strategies under Cohesion Policy by creating room for exchange and policy learning.



SAT4SUD – Self-assessment tool for Sustainable Urban Development Strategies

Such tool is intended to be used by Local Authorities and Managing Authorities of EU Cohesion Policy. It aims to support them when verifying to what extent the strategy builds on an integrated and participatory approach.

JRC tools for sustainable urban development available on the Urban Data Platform plus.

TYPE
concept
methodology
eu policy initiative
example

LEVEL
local
regional
national
european

Mapping funding opportunities

PURPOSE Mapping the main EU sources of funding to support the transitions

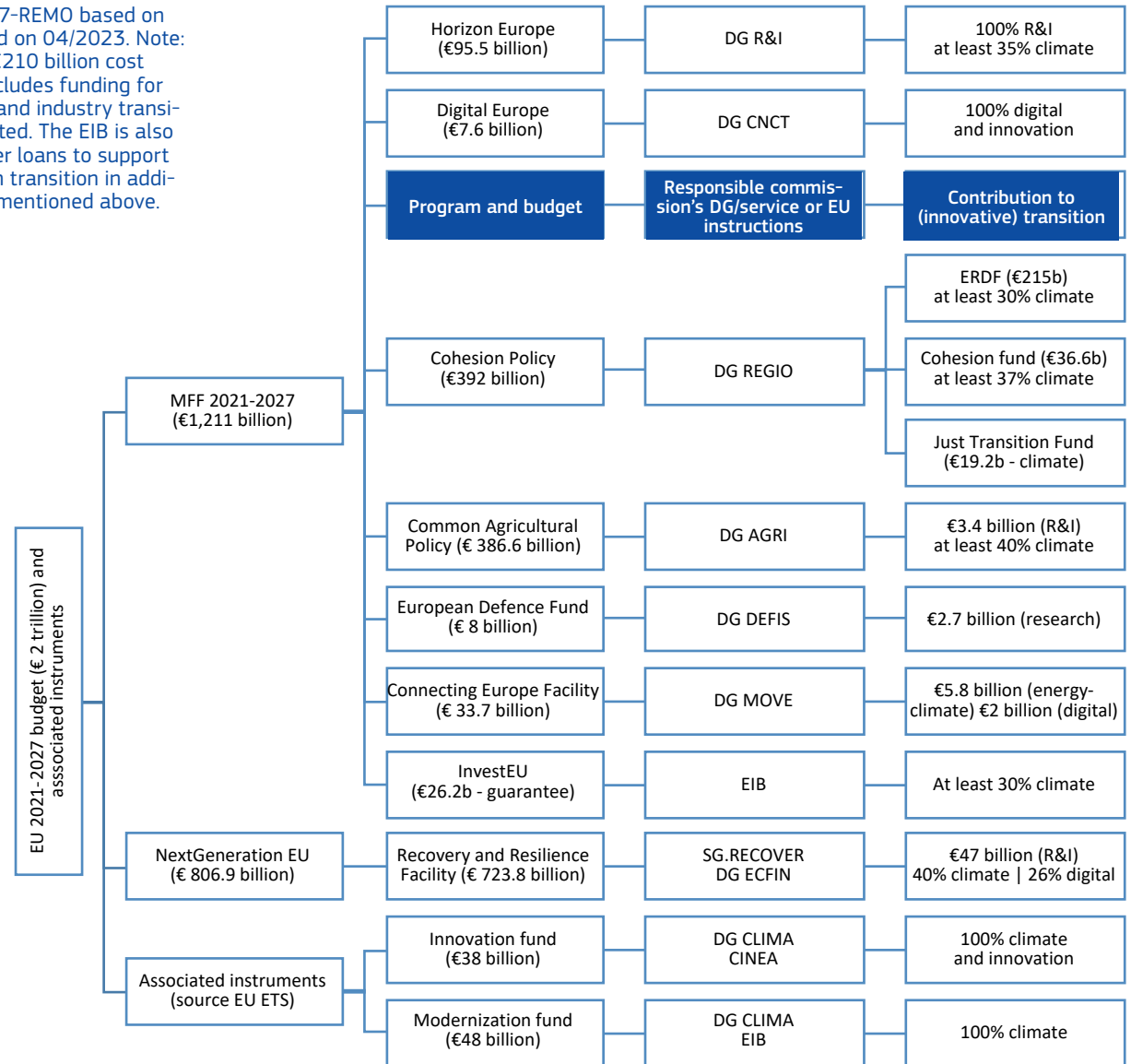
USE Getting an overview of EU funds for the twin transitions

ACTIONBOOK ACTIVITIES
Developing a strategy
Mobilising resources
Prioritising funds

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Carmen Madrid

MORE
→ [European Green Deal Investment Plan](#)
→ [Territorial Economic Data viewer](#)

Source: JRC-B7-REMO based on data extracted on 04/2023. Note: REPowerEU (€210 billion cost estimated) includes funding for clean energy and industry transition not reported. The EIB is also providing other loans to support R&I and green transition in addition to those mentioned above.



To achieve the European Green Deal targets require considerable public and private investments. At least €260 billion of additional annual investment are required to achieve the current Commission's 2030 climate and energy targets. The European Green Deal Investment Plan targets to mobilise at least €1 trillion to

support sustainable investments over the next decade through the EU budget and associated instruments, in particular InvestEU. The figure below gives an overview of the main sources of funding (grants and loans), to support the green and digital transitions, and in particular Research and Innovation (R&I).

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Measuring and monitoring resilience

PURPOSE Building knowledge of strengths and weaknesses to navigate transitions

USE Identifying and monitoring vulnerabilities and resilience capacities

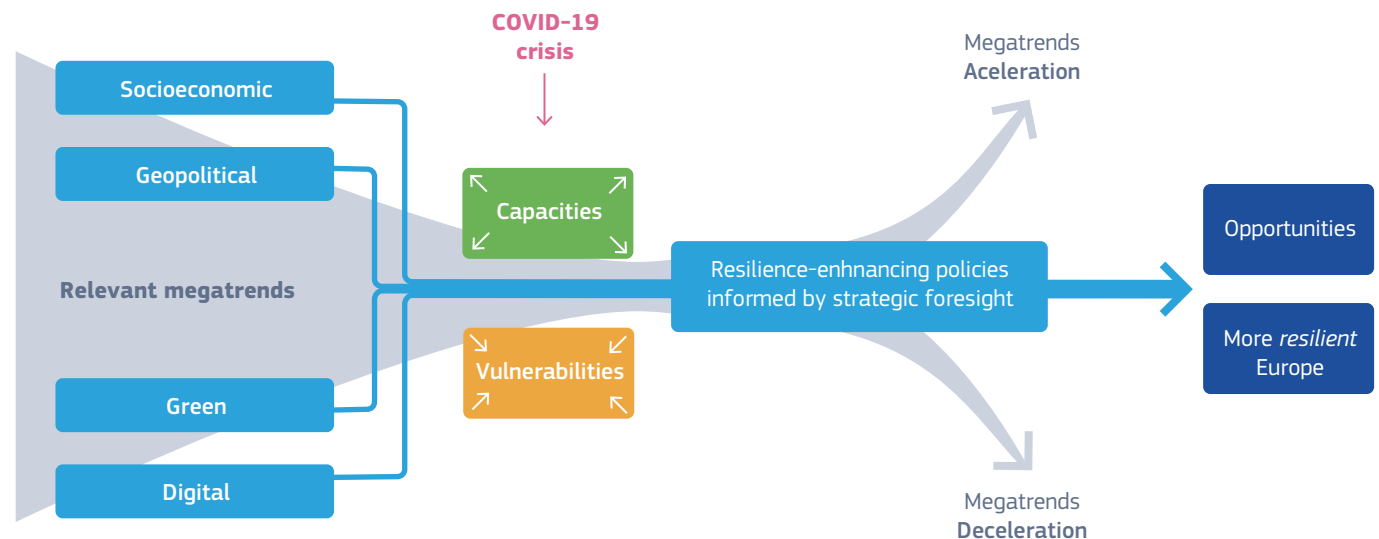
ACTIONBOOK ACTIVITIES **Mobilising resources**
Managing and transforming knowledge
Continuous monitoring
Evaluating impact
Mobilising competences

AUTHORS (JRC-resilience@ec.europa.eu)

MORE → [2020 Strategic Foresight Report](#)
→ [Resilience repository](#)

The resilience dashboards aim to provide a holistic assessment of resilience in the EU and its Member States. In relation to ongoing societal transformations and challenges ahead, the dashboards assess resilience as the ability to make progress towards policy objectives amidst challenges. Through a broad set of forward-looking indicators drawing on strategic foresight, the resilience dashboards inform about a Member State's ability to make progress and assess its relative strengths and weaknesses across four interrelated dimensions: social and economic, green, digital, and geopolitical. The RDB comprise 124 quantitative indicators showing vulnerabilities (i.e. features that can exacerbate the negative impact of crises and transitions, or obstacles that may hinder achieving long-term strategic goals) and capacities (i.e. enablers or abilities to cope with crises and structural changes and to manage the transitions) that can become increasingly relevant, both to navigate on-

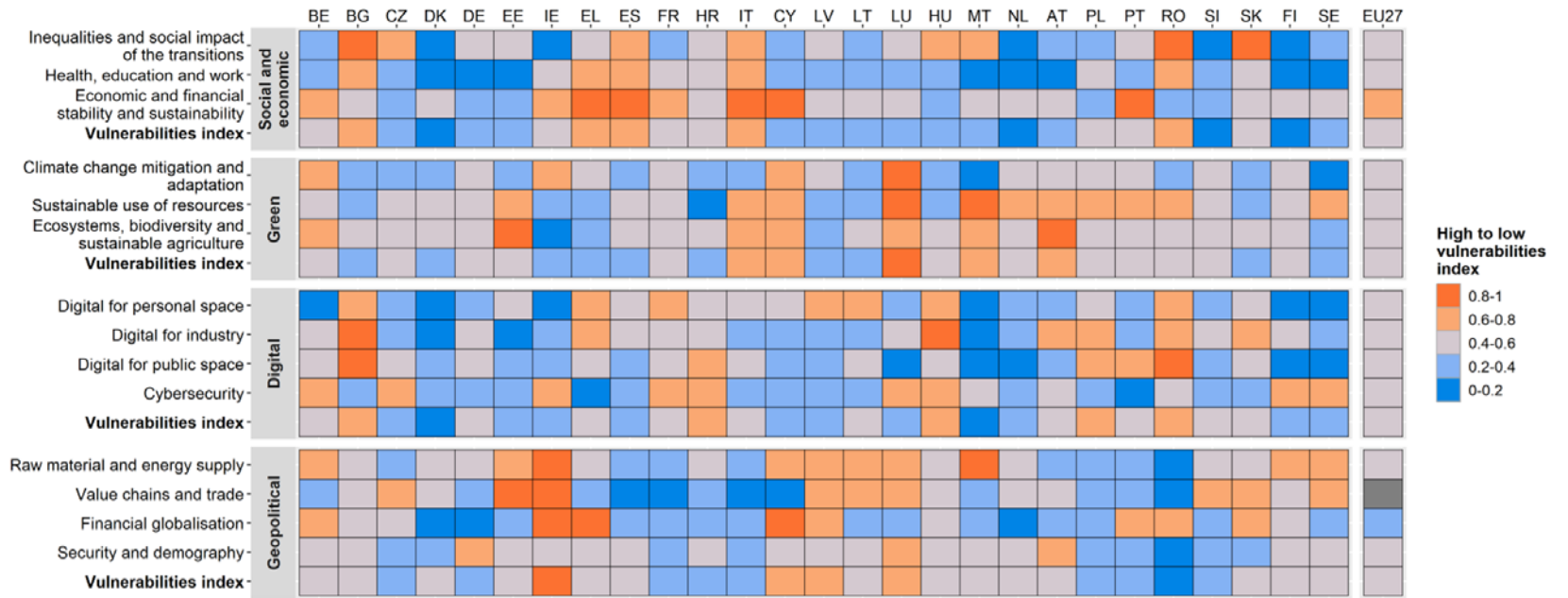
going transitions and to cope with potential future shocks. To this end, the RDB help to identify areas that need further efforts to build stronger and more resilient economies and societies. The RDB can contribute to the ex-post assessment of Europe's recovery and resilience strategy. The dashboards ultimately aim to answer the question: through our policies and recovery strategy, are we effectively making the EU more resilient? Partnerships for Regional Innovation can play a key role in enhancing the resilience of regions. Assessing and monitoring resilience at regional level can help local government shed light on policy areas that could deserve their attention. The JRC can offer help for the regions to design and develop such assessment and monitoring tools for their respective circumstance, in terms of data selection, preparation and benchmarking. In addition, the JRC is aware of some ongoing efforts for the territorialisation of the resilience dashboards.



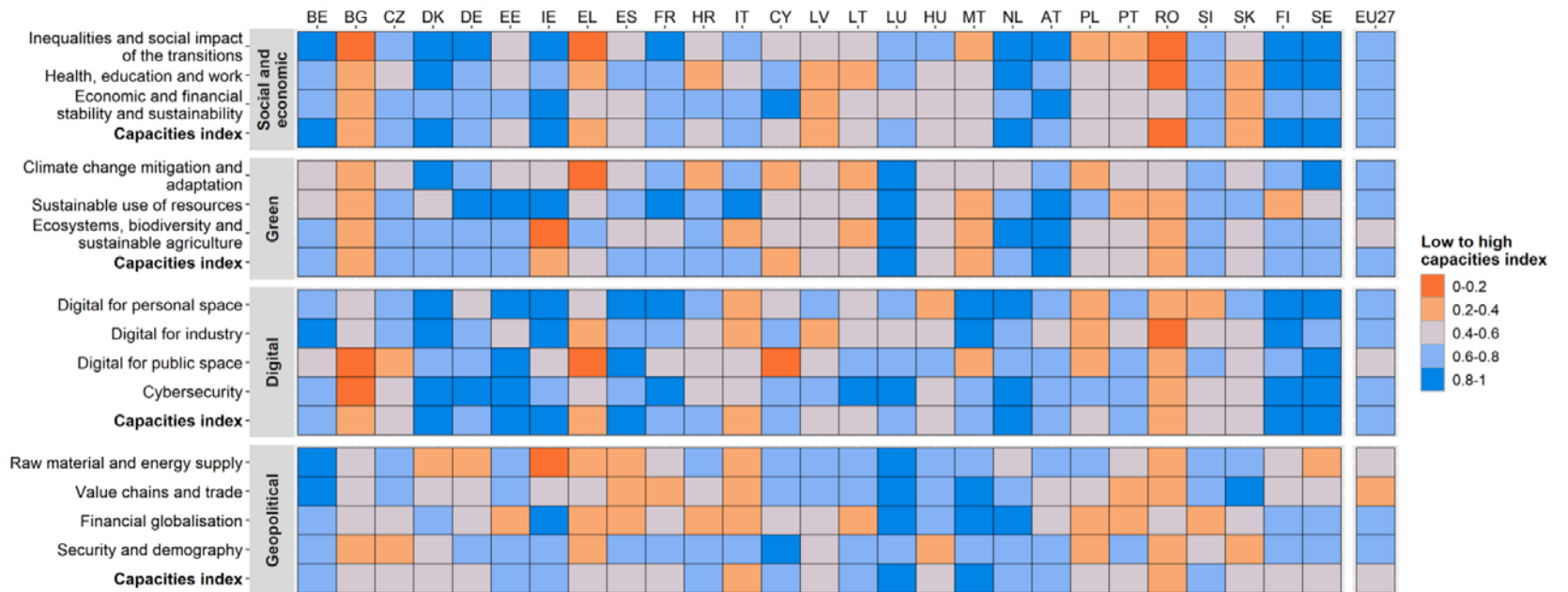
Four dimensions of resilience – from the EU and Member States to regions.

Note: The synthetic indices aggregate the relative situation of countries across all considered indicators. A higher vulnerabilities index indicates higher vulnerabilities (from blue to dark orange), while a higher capacities index indicates higher capacities (from dark orange to blue), compared with other countries. The figure below shows the vulnerabilities and capacities indicators per dimension and area. Each dimension includes approximately 30 indicators distributed as vulnerability indicators and resilience capacity indicators.

Vulnerabilities indices per dimension and area



Capacities indices per dimension and area



Synthetic indices across all areas and all dimensions (data up to 2021).



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Monitoring and evaluation in an impact-based policy

PURPOSE Understanding the role of monitoring and evaluation in policy design

USE Putting in place an evaluation and impact assessment procedure transitions

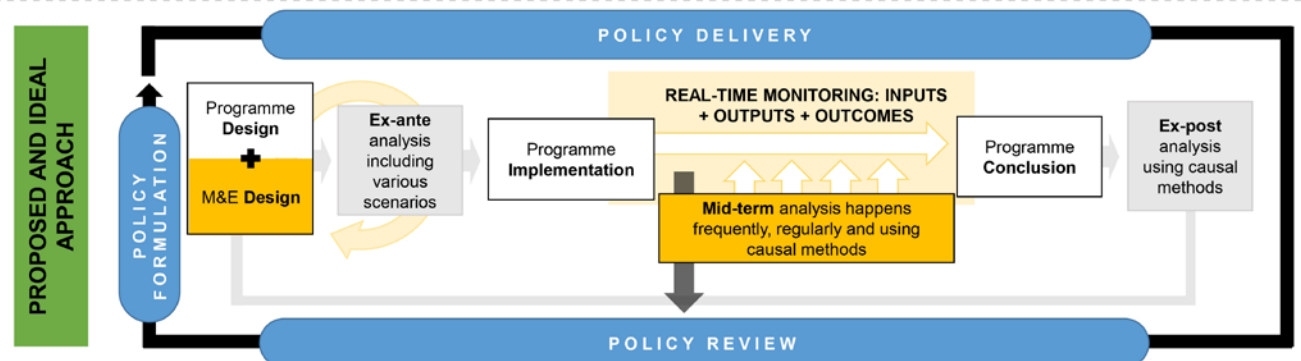
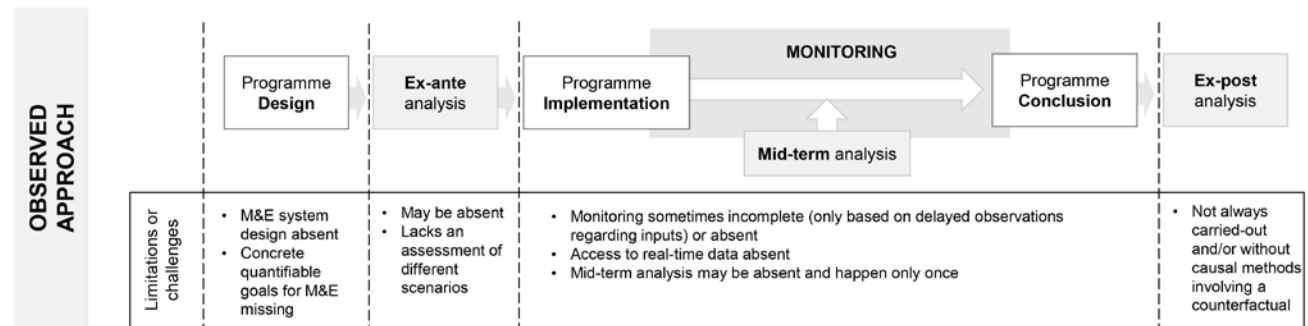
ACTIONBOOK ACTIVITIES Identifying stakeholders for given societal goals
Deploying a strategy
Continuous monitoring
Evaluating impact

AUTHORS Anabela Marques Santos (anabela.marques-santos@ec.europa.eu)
Alex Coad

MORE → [EVALSED: The resource for the evaluation of Socio-Economic Development - Evaluation guide](#)
→ [Suggestions for Monitoring and Evaluation of Transformative Innovation Policy](#)

For PRI, M&E are key elements in the different phases of the policy cycle, and they are more than a legal obligation. They are part of the policy intelligence, and lessons learned from previous evaluations should support programme design and/or policy formulation, instead of having a M&E system appearing after the programme implementation stage only (see figure below). Consequently, and following Molas-Gallart et al. (2021), we

highlight the need of designing and implementing a M&E system in parallel with programme design, to support the definition of quantifiable goals and policy actions to achieve them. Designing a M&E system implies planning for the different steps and players of the M&E system, namely, to define the indicators, the sources for data collection and the methods for evaluation.



Top: Unsophisticated M&E. Bottom: Proposed and ideal M&E system
Source: Marques Santos and Coad (2023:15).

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Monitoring and evaluation: what and how to evaluate?

PURPOSE Having an evaluation system fit for PRI

USE Putting in place a continuous evaluation system

ACTIONBOOK ACTIVITIES

- Building legitimacy
- Scaling and mainstreaming
- Continuous monitoring
- Evaluating impact

AUTHORS

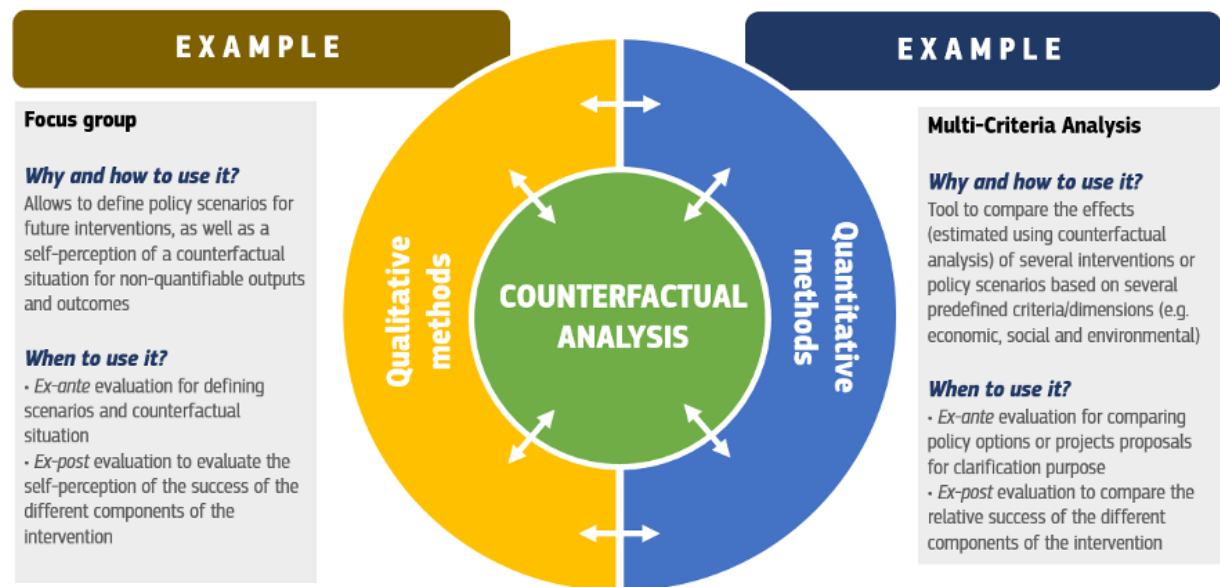
Anabela Marques Santos
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Alex Coad

MORE

- [EVALSED :The resource for the evaluation of Socio-Economic Development - Evaluation guide](#)
- [Suggestions for Monitoring and Evaluation of Transformative Innovation Policy](#)

Evaluation refers to the process of determining the success or failure of a policy/programme. In a traditional approach, there are three main different types of evaluation: i) ex-ante analysis conducted before programme implementation; ii) mid-term analysis carried out once during the period of implementation; and iii) ex-post analysis aiming to account for the achievement of expected impacts. The evaluation framework of PRI should follow a traditional approach but include a more continuous process. It should go hand in hand with the evaluation of investment projects to be implemented in the territory and the monitoring process. As an impact-based policy, the starting point lies in defining the expected impact(s) and then designing the programme/policy intervention and identifying the inputs to achieve it (or them). Inputs include not only funding opportunities but also multilevel governance, policy-mix, and stakeholder involvement. The assessment of outcomes should also go beyond the direct effect at the beneficiary-level and include spillover effects in the territory and along the value chain (multilevel perspective). It also involves

adding other evaluation criteria (e.g. equity and acceptability) in addition to the traditional ones (relevance, coherence, efficiency, effectiveness, utility, and sustainability). In the PRI approach, we recommend to use a mix of techniques and methods for evaluation, combining counterfactual analysis with other qualitative and quantitative approaches. Qualitative methods refer to surveys, interviews, focus groups and case studies. They can help identify important variables and mechanisms to measure in quantitative analysis. Furthermore, the counterfactual situation (without policy intervention) can potentially be designed or estimated thanks to specific questions included in the interviews or focus group. Quantitative methods include combining counterfactual analysis with other techniques like Multi-Criteria Analysis (MCA) and Cost-Benefit Analysis (CBA). Since PRI is about trade-offs, co-benefits, and stakeholders' involvement, for instance, the impact assessment conducted using counterfactual analysis and eventually different scenarios can be combined with MCA and CBA.



PRI evaluation approach as a combination of methods.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Monitoring the SDGs at local and regional level

PURPOSE Monitoring sustainability in an integrated and holistic way

USE Tracking place-based progress on sdgs to inform policy

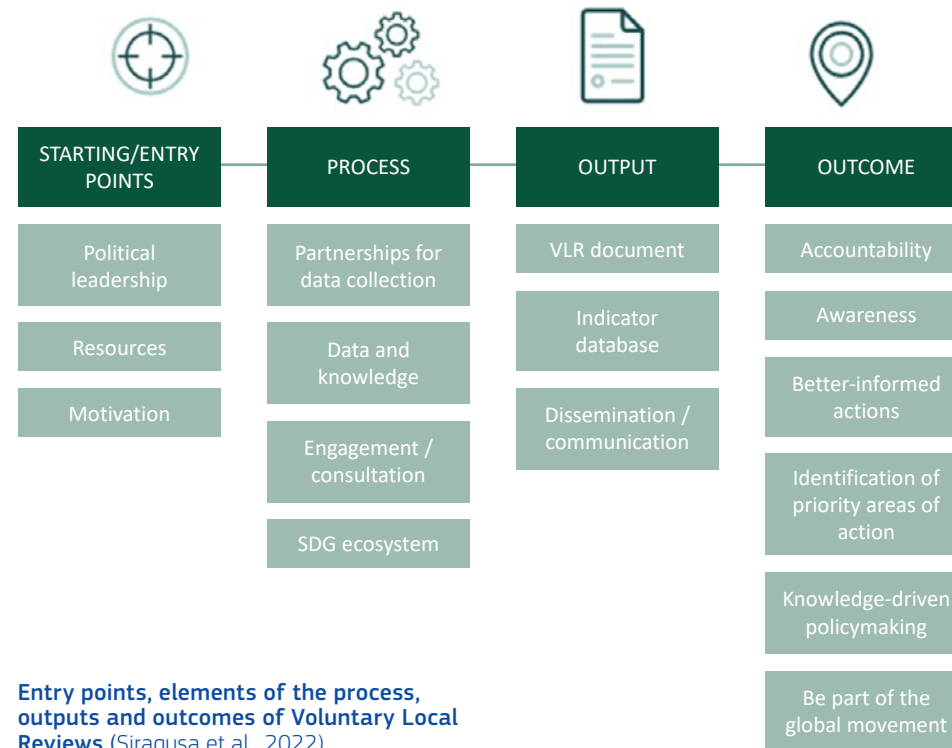
ACTIONBOOK ACTIVITIES Managing and transforming knowledge
Continuous monitoring
Evaluating impact
Mobilising competences

AUTHORS Iraklis Stamos
(iraklis.stamos@ec.europa.eu)

MORE → [Monitoring the SDGs at regional level in EU. REGIONS2030 pilot project Final Report](#)
→ [European Handbook for SDG Voluntary Local Reviews – 2022 edition](#)
→ [The Localisation of the Sustainable Development Goals - EU Science Hub \(europa.eu\)](#)

The 2030 Agenda for Sustainable Development and the SDGs provide an invaluable framework for local and regional governments like yours to drive holistic and transformative action towards sustainability. In recent years, the SDG Voluntary Local Reviews (VLRs) have emerged as a powerful tool for assessing the implementation and progress of the 2030 Agenda at the local level. By 2023, more than 250 Local and Regional Governments globally (104 of which in Europe) have submitted their VLR! We understand the importance of tailoring these reviews to your region's unique needs, specificities and particularities, allowing you to adapt targets and key indicators to address specific challenges.

Through your own VLRs, you can monitor progress, benchmark with peers, and refine your strategies accordingly. After several consultation processes and pilot projects, we are excited to introduce new methods, tools and indicators (including both official and experimental ones), to develop effective SDG local monitoring systems that cater specifically to European cities and regions. These tools enable governments and stakeholders to transcend sectoral boundaries and make informed decisions based on reliable and timely data. With our reports and handbooks, we aim to provide you with the necessary insights and resources to leverage the potential of VLRs and other supporting tools.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Monitoring: an example from Catalonia

PURPOSE Designing dynamic and participatory monitoring systems

USE Monitoring PRI features

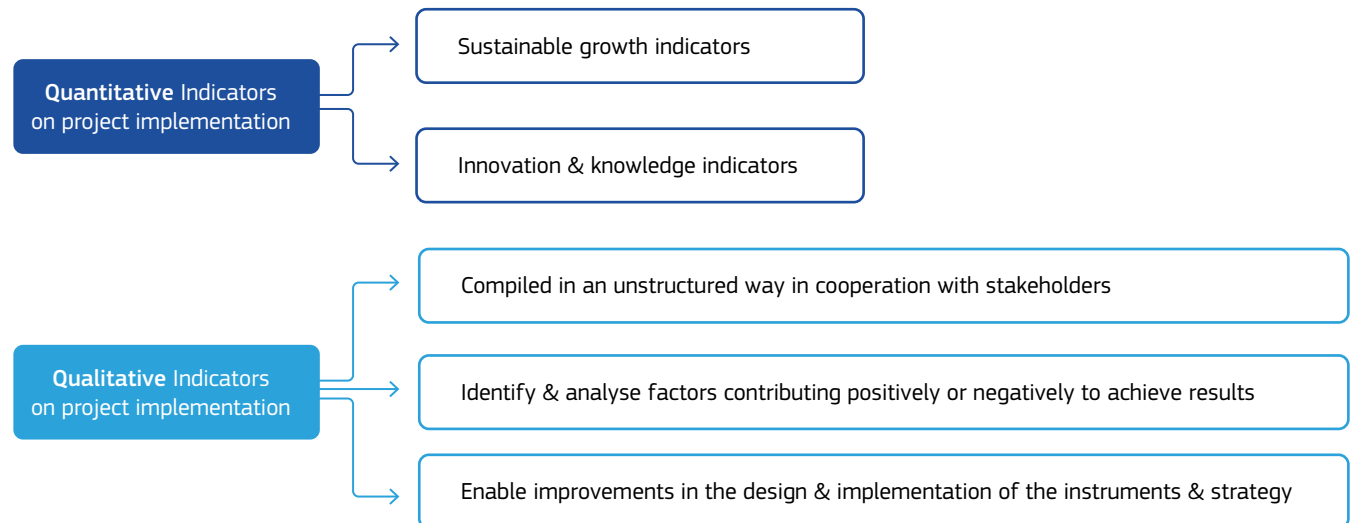
ACTIONBOOK ACTIVITIES Setting up a network governance
Experimenting and demonstrating
Continuous monitoring
Learning from experimentation

AUTHORS Solange Mifsud
(JRC-PRI-Pilot@ec.europa.eu)

MORE → [RIS3CAT \(Catalonian RIS3\) Monitoring System](#)
→ [S3 for SDGs in Catalonia](#)

Monitoring systems in a PRI dimension require to be dynamic and participatory, thus focusing more on strategic learning than on achieving pre-established objectives. This comprises key elements including governance, articulation of the contribution by key stakeholders, strengthening synergies, maximising collective impacts, and putting in place a common system of indicators and monitoring leading to a dynamic overview for proper decision-making. The monitoring system has to be planned immediately at the kick-off of the strategy. However, you should bear in mind that a dynamic and participatory monitoring system has to be flexible so

that the questions that it is trying to answer can evolve over time. This will lead to more effectiveness. The monitoring system has to take into account the complexity of the real situation in all its dimensions and interrelations, dovetailed with the development and exploration of tools and indicators to capture such complexity. You can see in the figure below some sources of indicators that you may want to consider when developing a monitoring system fit for the needs in your region. These are the indicators used in the Catalonia monitoring system. Could you take inspiration from these practical indicators?



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Monitoring: what to?

PURPOSE Critically tailoring monitoring for PRI

USE Putting in place a monitoring system

ACTIONBOOK ACTIVITIES Diagnosing and developing a vision
Setting milestones and targets
Managing and transforming knowledge
Continuous monitoring

AUTHORS Anabela Marques Santos
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Alex Coad

MORE → [Territorial Economic Data viewer](#)
→ [The Annual Climate Action Monitor](#)

Under a traditional approach, monitoring refers to a periodic process of analysing the outputs. In the context of place-based transformations, it must go beyond and focus on examining its outcomes and impacts. Nevertheless, in both cases, it should be carried out during the execution phase of a programme/policy intervention, with the aim of correcting any deviation from desired objectives/goals. Transformative monitoring (or PRI monitoring) should differ in terms of scope, dimensions, and focus of analysis on the basis of its singular characteristics, as described in the figure below. For instance,

instead of monitoring achievements, measured by indicators associated with subsidized beneficiaries, it should focus on the monitoring of outcomes and net impacts. Furthermore, it should also screen the spillovers at the territorial level to assess not only the desired effects but also the non-desired effects. Such concepts are also associated with policy footprint, i.e. the quantification of the environmental footprint of the policy choice along the value chain, from the development and production of new products/technologies to their end-of-life after their use.

	TRADITIONAL APPROACH	PRI APPROACH
SCOPE	<ul style="list-style-type: none"> • Performance-based analysis 	<ul style="list-style-type: none"> • Impact-based analysis
DIMENSIONS	<ul style="list-style-type: none"> • Socio-economic dimensions 	<ul style="list-style-type: none"> • Stakeholders involvement • Policy-mix (synergies and complementarities) • Socio-economic and environmental dimensions
FOCUS	<ul style="list-style-type: none"> • Achievements at beneficiary-level Static in given period <p>(e.g. R&I investments, number of subsidized firms, number of employment created by subsidized firms, firms in R&D cooperation between firms or university-firm)</p>	<ul style="list-style-type: none"> • Multiple-level perspective • Direct impacts and spillovers at territory-level (desired and non-desired effects) • Dynamic over time to ensure the continuity of the effects

Traditional versus PRI monitoring methodological approaches.

Source: Based on Marques Santos and Coad, 2023.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

National and regional science for policy ecosystems for innovation

PURPOSE Connecting scientific institutions with policymakers

USE Obtaining evidence-informed innovation policymaking at various levels of governance

ACTIONBOOK ACTIVITIES Identifying stakeholders for given societal goals
Collaborating across territories
Designing ecosystem support
Mobilising competences

AUTHORS Kristian Krieger
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MORE → [Science meets Regions](#)
→ [Science for Policy Ecosystems](#)
→ [Competences for scientists and policymakers](#)

Innovation strategies require entire ecosystems of support, involving a wide range of enterprises, government measures and services, citizens, social partners, finance, and research and technology organisations. By mobilising a diverse set of stakeholders, you can ensure that sector-specific challenges and needs can be anticipated and addressed collaboratively while benefits of innovation can be widely shared. One of the critical relationships for innovation within such ecosystems connects scientific institutions with policymakers: Scientists can help policymakers make sense of cutting-edge innovations, as well as develop and identify policy options with the greatest transformative potential. Policymakers can help direct research into fields of direct relevance for innovation and innovation policies. Scientific expertise on the varied impacts of different intervention also helps connect different governmental services, promoting a Whole-of-Government approach to innovation. Yet, you can face challenges along the way. Obstacles range from a simple mismatch of timeframes and diverging incentives to deep-seated cultural differences. However, you can refer to a set of practical tools developed by the

JRC to overcome these obstacles, strengthening capacity for science-policy engagement both of individual researchers and policymakers, as well as of scientific institutions and policymaking bodies at various levels of governance. Participatory events involving key stakeholders from the science-policy interface: Participatory science for policy ecosystems workshops and innovation camps (several are in the pipeline) have been successfully used for SWOT analyses, co-creation of capacity building projects in support of using evidence in policymaking, mutual learning and networking between sectors and across Member States, regions and cities. Building competences for science-policy engagement with training: training modules and materials have been developed for both scientists and policymakers to allow individuals to develop the knowledge, attitude, and skills to better engage with partners and processes in the other sector. Pairing and placement schemes: a pairing scheme will be put in place allowing regional and local policymakers to spend time with scientists working on issues that are relevant to the policy challenges they face.



Three tools for harnessing the power of science for policy ecosystems for innovation.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

ODP: an international dimension

PURPOSE Adding a stronger international dimension to discovery process

USE Linking local strengths with the global opportunities for policy and projects

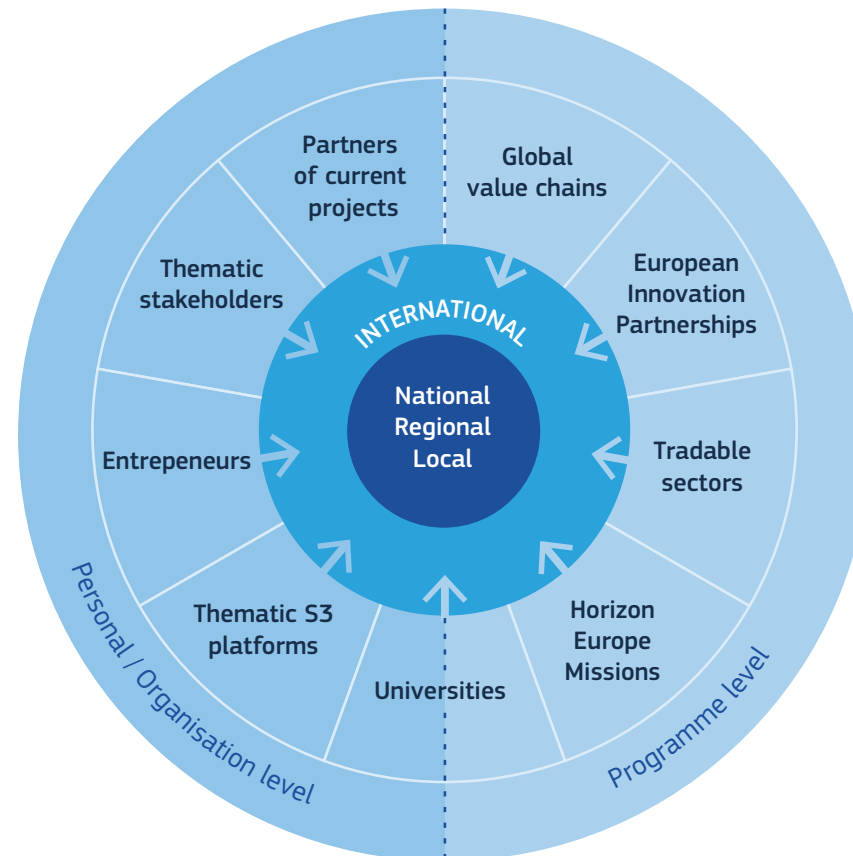
ACTIONBOOK ACTIVITIES Identifying stakeholders for given societal goals
Setting up a network governance
Agenda setting and sharing
Collaborating across territories

AUTHORS Ramojus Reimeris
(JRC-PRI-Pilot@ec.europa.eu)

MORE → [Cross-border Smart specialisation strategy of Galicia- Northern Portugal \(RIS3T\)](#)

While entrepreneurial discovery process (EDP) emphasises on the local/regional or national assets, the international the national and especially international opportunities can be often overlooked or not fully exploited in practice. Open discovery process (ODP) aims to further develop mechanisms of openness to link local strengths with global opportunities. The international dimension is embedded into the discovery process to some extent, as countries/economies do not act in isolation and participating stakeholders do bring their experience and plans for further international actions. However, such attention to international dimension does not fully cover the discovery phase, as it is more focused on the implemen-

tation afterwards. Then, how can sustainability innovators, like yourself, include international stakeholders into the thinking process of ODP and facilitate their participation so that all stakeholders benefit? To start, you can look at the international landscape when you conduct stakeholder mapping. Then, the international stakeholders in the personal or organisational capacity should be joining the ODP and “doing the thinking together”, based on identified mutual interests. On the programme level, clearly formulated linkages to global value chains, European Innovation Partnerships, Horizon Europe missions, etc. can represent the international dimension. Take a look at the figure below to get some inspirations.



Components for stronger international dimension of ODP.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

ODP: science-based ODP building on the Seville process

PURPOSE Supporting policy implementation

USE Forming science-based stakeholder consensus

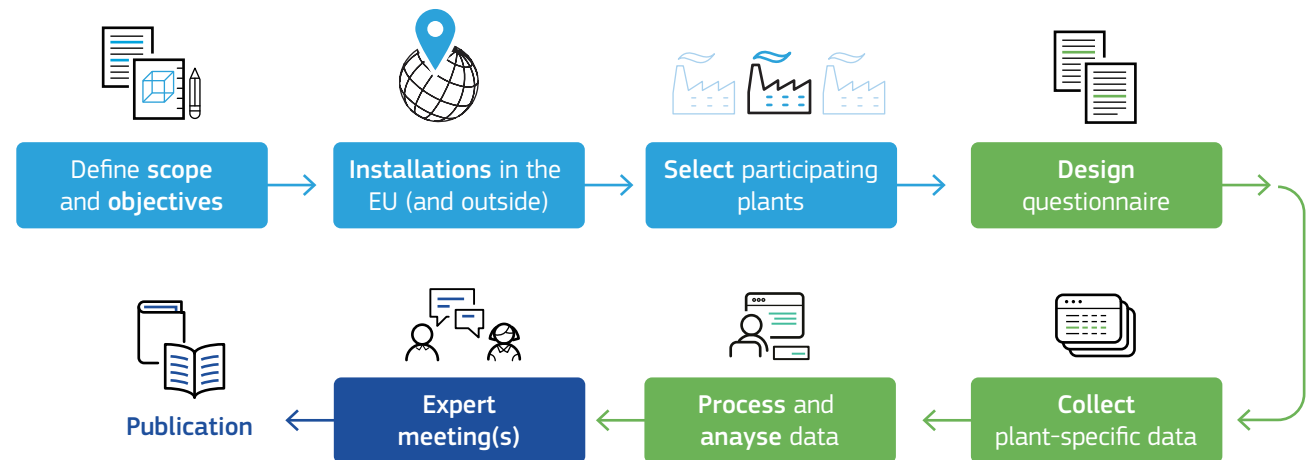
ACTIONBOOK ACTIVITIES
Building legitimacy
Setting milestones and targets
Learning from experimentation

AUTHORS Georgios Chronopoulos
(JRC-B5-EIPPCB@ec.europa.eu)

MORE
→ [Video on the Sevilla process](#)
→ [European IPPC Bureau](#)
→ [Industrial emissions and safety](#)

While entrepreneurial discovery process (EDP) emphasises on the local/regional or national assets, the international the national and especially international opportunities can be often overlooked or not fully exploited in practice. Open discovery process (ODP) aims to further develop mechanisms of openness to link local strengths with global opportunities. The international dimension is embedded into the discovery process to some extent, as countries/economies do not act in isolation and participating stakeholders do bring their experience and plans for further international actions. However, such attention to international dimension does not fully cover the discovery phase, as it is more focused on the implemen-

tation afterwards. Then, how can sustainability innovators, like yourself, include international stakeholders into the thinking process of ODP and facilitate their participation so that all stakeholders benefit? To start, you can look at the international landscape when you conduct stakeholder mapping. Then, the international stakeholders in the personal or organisational capacity should be joining the ODP and “doing the thinking together”, based on identified mutual interests. On the programme level, clearly formulated linkages to global value chains, European Innovation Partnerships, Horizon Europe missions, etc. can represent the international dimension. Take a look at the figure below to get some inspirations.



Phases of the Sevilla process, applied to large scale agro-industrial installations.

T47

TYPEconcept
methodology
eu policy initiative
example**LEVEL**local
regional
national
european

Open Discovery Process (ODP)

PURPOSE Building partnerships, action plans and projects

USE Engaging and working with stakeholders on local problems

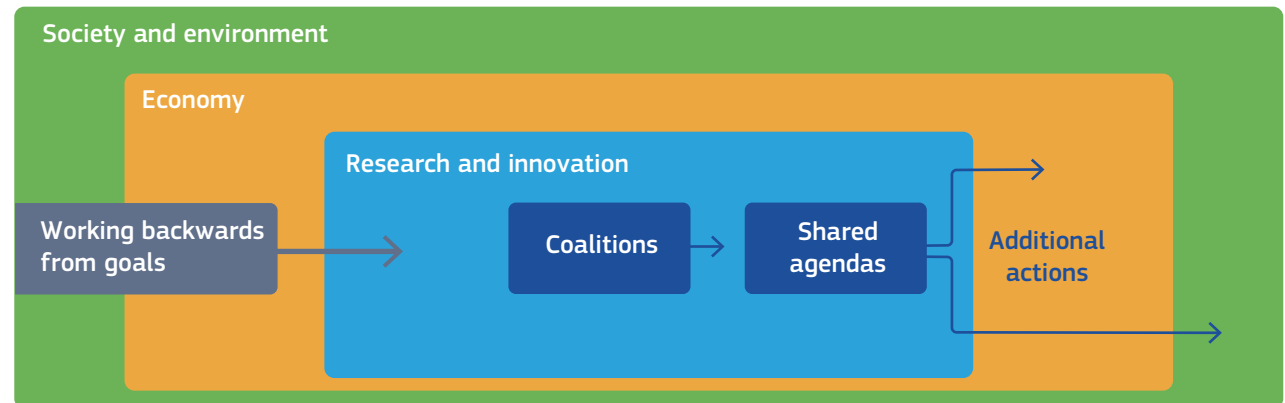
ACTIONBOOK ACTIVITIES Identifying stakeholders for given societal goals
Setting up a network governance
Agenda setting and sharing
Coordinating the policy and action mix

AUTHORS Ramojus Reimeris
(JRC-PRI-Pilot@ec.europa.eu)

MORE → [Articulating shared agendas for sustainability and social change: A contribution from the territory to the EU debate on transitions to sustainability](#)
→ [Designing missions. Mission-oriented innovation in Sweden – A practice guide by Vinnova](#)

Participatory governance is embodied in processes that empower citizens to participate in public decision-making. Participatory governance broadly refers to the democratic mechanisms that are intended to involve citizens in public policymaking processes. There is evidence that participatory governance practices are contributing to stronger government transparency, accountability and responsiveness, and improved public policies and services. Participatory governance is being promoted in different contexts to increase the engagement of citizens in public policymaking process and in broader processes of public value co-creation.

The development of smart specialisation strategies rely on identification of priority areas and the exploration of the potential for economic transformation within these areas. Strategic priority areas are selected through a participatory process within a top-down approach steered by national and/or regional authorities – entrepreneurial discovery process (EDP, see T60 S3: Smart specialisation strategies). Because of S3, regions are focused on local needs, policy design is becoming more evidenced-based and broader consultation is contributing to have regional stakeholders more involved in regional innovation policymaking.



Open discovery process relies on working backwards from goals with coalitions of stakeholders in a multilevel perspective.

TYPE
concept
methodology
eu policy initiative
example

LEVEL
local
regional
national
european

Participatory governance and EDP

PURPOSE Co-creating public value with stakeholders

USE Engaging stakeholders in policymaking

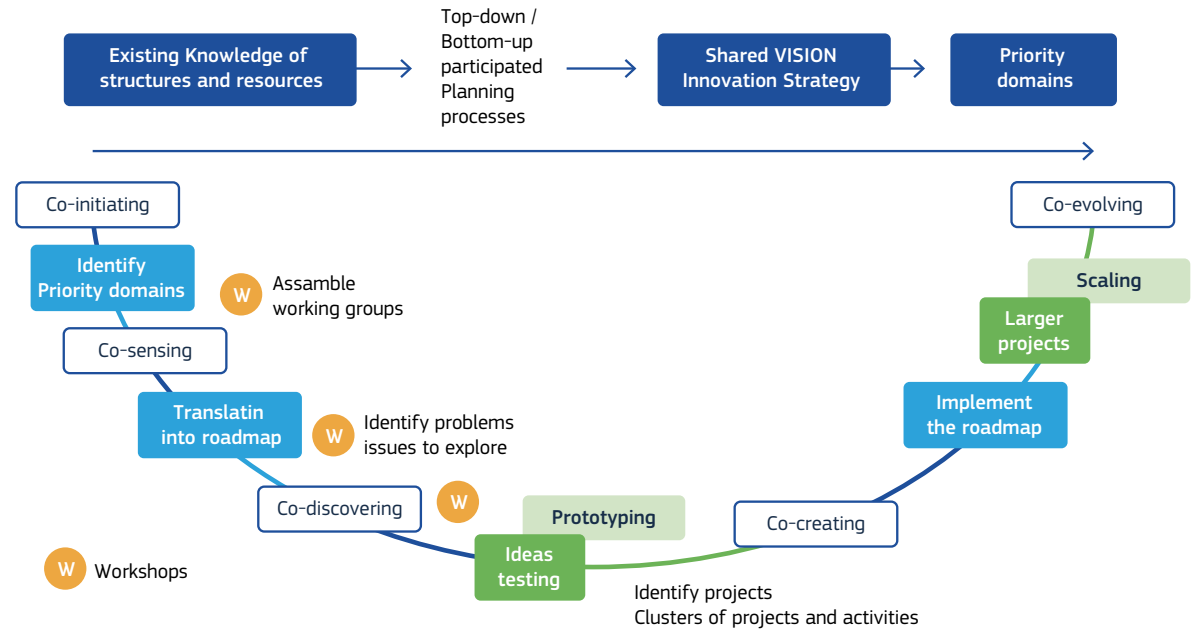
ACTIONBOOK ACTIVITIES Identifying stakeholders for given societal goals
Setting up a network governance
Agenda setting and sharing

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MORE → [Smart Specialisation Platform](#)

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S3 as Strategic Planning Process and S3 as a balanced planning and participatory incremental process.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

POINT reviews

PURPOSE Informing policy development across domains

USE Collecting evidence about the affected systems

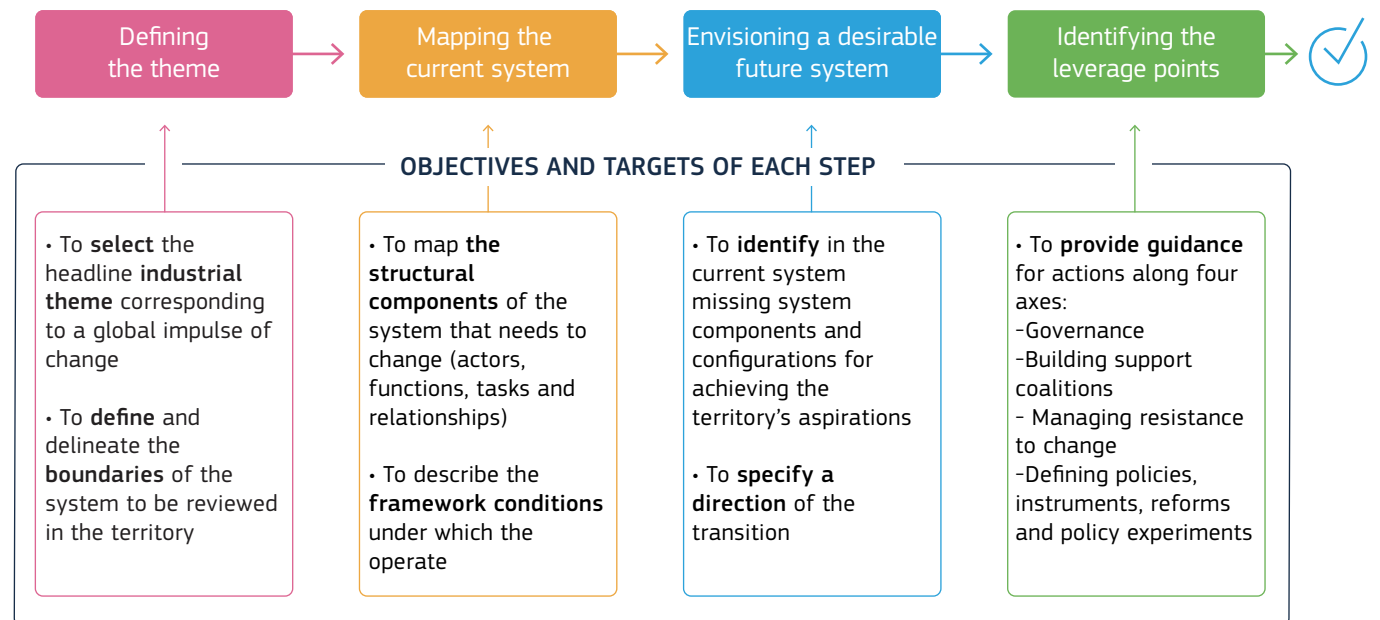
ACTIONBOOK ACTIVITIES
Identifying stakeholders for given societal goals
Enabling multilevel cooperation
Developing the policy and action mix
Prioritising funds

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Anabela Marques Santos
(JRC-PR1-Pilot@ec.europa.eu)

MORE
→ [POINT Reviews: an overview](#)
→ [POINT Review of Industrial Transition of Bulgaria](#)
→ [POINT Review of Industrial Transition of Greece](#)

A POINT (Projecting Opportunities for INDUSTRIAL TRANSITIONS) review is an expert study of the policy support system. It is a tool designed to generate policy recommendations for transformative, system-level, innovation. A first objective of a review is to collect missing evidence necessary for understanding the extended industrial system undergoing transition. A second objective is to identify opportunities for industrial development and offer concrete policy pathways. The overall aim is to contribute to the development of a credible, coherent and ambitious direction for transition that delivers co-benefits for the economy, society and environment. You can follow the POINT methodology by the JRC to conduct expert reviews, drawing on desk, field research and extensive stakeholder consultations. The POINT methodology evaluates policy contributions to

four essential functions of any industrial system: orientation; resource mobilisation; production; consumption. POINT adopts a framing of system-level innovation that includes groups such as workers, users and households that may otherwise be missed. The broad framing enables you to identify relevant policies that should be coordinated and develop complementary actions and reforms under a coherent directional logic. A review draws on extensive research, wide stakeholder consultations and international experiences. Below you can check the four main steps of a POINT review. A SWOT analysis of key functions can be supported by quantitative evidence and can be also combined with complexity analysis to showcase the most technologically promising paths.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Policy mix for the digital transition

PURPOSE Enabling the uptake of benefits from digital technologies

USE Putting in place a policy and action Mix for the digital transition

ACTIONBOOK ACTIVITIES

- Setting up a network governance
- Enabling multilevel cooperation
- Collaborating across departments
- Developing the policy and action mix
- Coordinating the policy and action mix

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MORE

- [Shaping Europe's digital future](#)
- [Shaping the digital transformation: EU strategy](#)

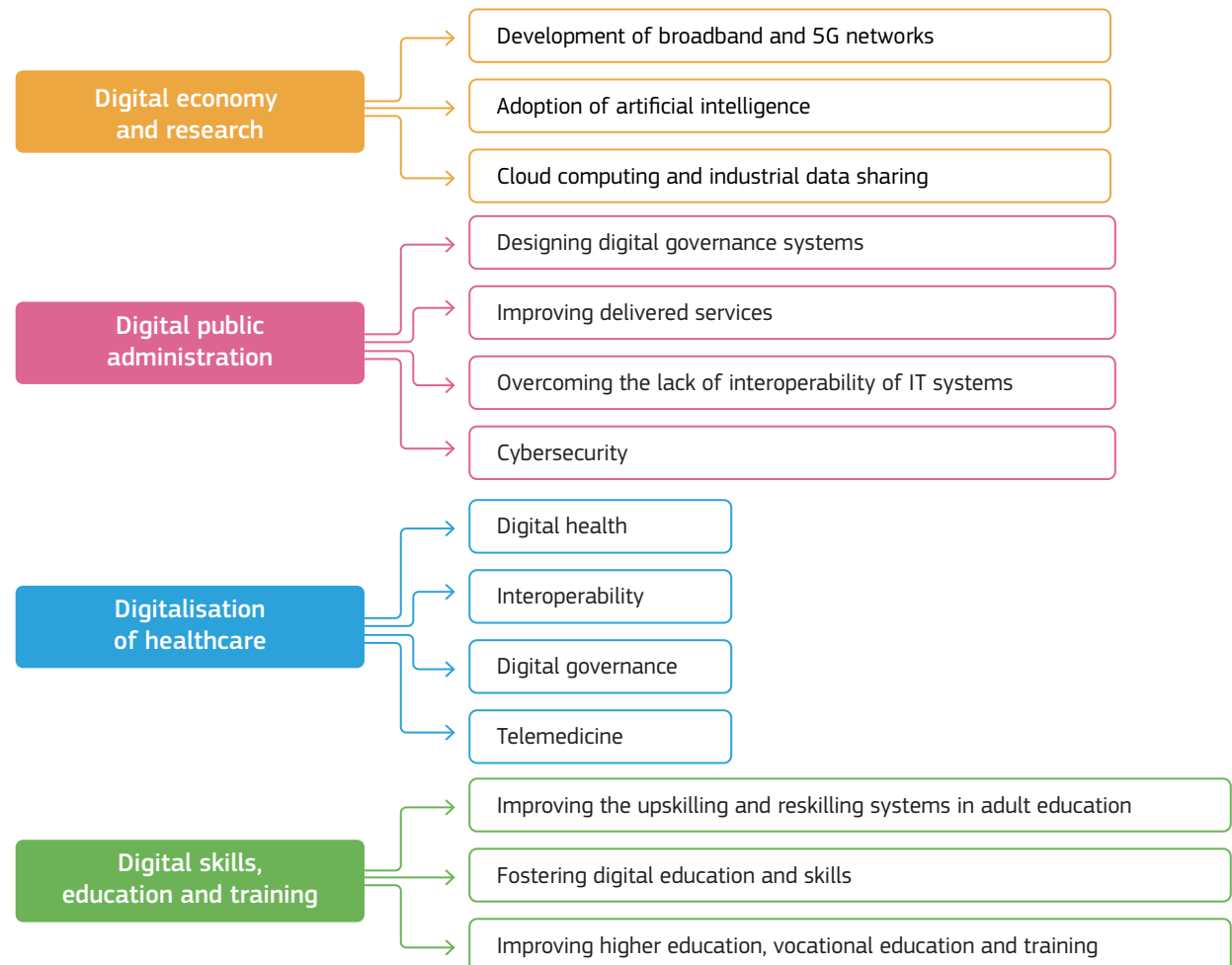
The digital and green transitions (or transformations) are at the core of the agenda for future sustainable growth adopted by the European Commission. The digital transition stands to mainstream the use of digital technologies by public and private sectors for the benefits of the society. The digital transition is based on three pillars: technology that works for the people; a fair and competitive digital economy; an open, democratic and sustainable society.

- Can you think how the digital transition has changed the

way you interact with your stakeholders?

- What benefits and challenges you face, or will face, at work as a consequence of more digital public administration?

Digital solutions that put people first will open up new opportunities for businesses, encourage the development of trustworthy technology, foster an open and democratic society, enable a vibrant and sustainable economy, help fight climate change and achieve the green transition.



Example of policy mix.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Policy mix for the green transition: the Ruhr area

PURPOSE learning about policy approaches and instruments for a fair green transition

USE putting in place a Policy and Action Mix for the green transition

ACTIONBOOK ACTIVITIES

- Setting up a network governance
- Enabling multilevel cooperation
- Collaborating across departments
- Developing the policy and action mix
- Coordinating the policy and action mix

AUTHORS Guia Bianchi
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MORE

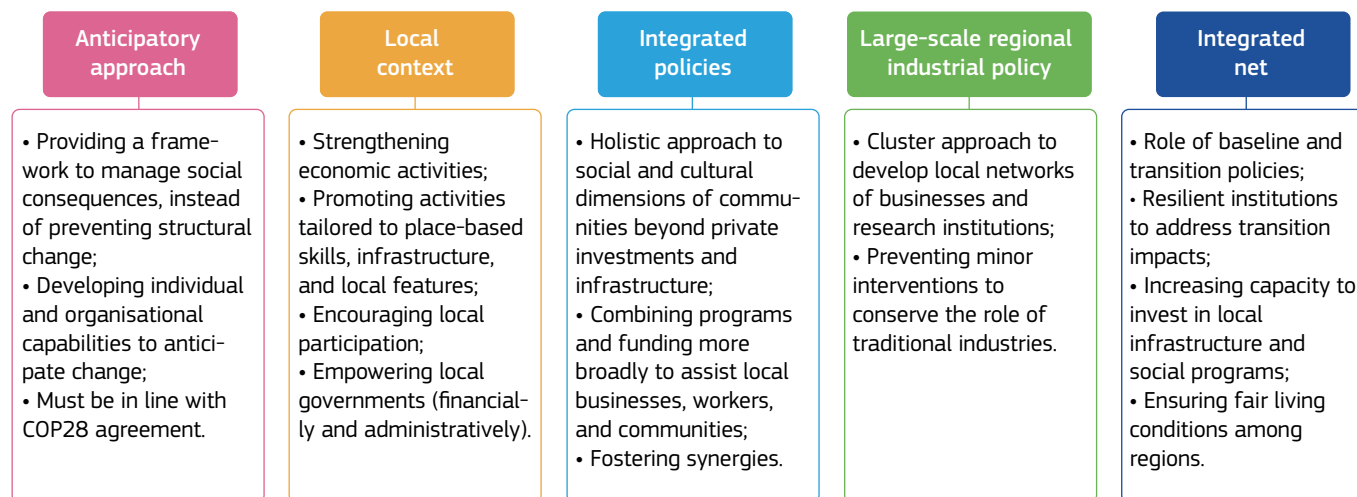
- [Lessons learnt from structural change processes in Germany](#)
- [The possible implications of the green transition for the EU labour market](#)

Phasing down coal production has contributed to economic decline, high unemployment and emigration rates and environmental degradation in German mining regions. To address these interrelated issues, a series of policy measures has been implemented since the 1960s. Their goals include (i) economic diversification and re-orientation; (ii) workforce support; (iii) social well-being and quality of life; and (iv) environmental remediation and protection (see the table below).

In addition, nationwide “baseline policies” included measures such as the German social security system, with unemployment protection and pension system; the labour system, with for example a codetermination mechanism and trade unions; and the system for regional fiscal equalization. Despite not directly related to coal phasing down, they played a major role together with a structural approach to policy to promote systematic transformations in coal regions.

Economic diversification and reorientation	Support to attract new businesses and financially support existing local enterprises beyond coal	Expansion of educational and research activities contributing to tertiary activities and attraction students and scholars	Focus on green energy, digitalization and automation technologies, while supporting existing regional potentials and clusters
Workforce support	Integrating labour market policies into regional development policies	Financing or co-financing job procurement and employment measures	Extension of qualification and career counselling infrastructure
Social well-being and quality of life	Urban development	Cultural and leisure activities by developing and modernizing physical infrastructure	
Environment remediation and protection	Decommissioning and environmental remediation	Water management	

Could you envision such a systemic approach to policy transition in your region?



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Priority compass

PURPOSE Having data-driven identification of regional level opportunities and capabilities

USE (As one of the tools) informing innovation policy design

ACTIONBOOK ACTIVITIES Building legitimacy
Designing ecosystem support
Prioritising funds

AUTHORS Dario Diodato
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Emanuele Pugliese

MORE → [Economic Complexity Analytics: Country Factsheets](#)
→ [Economic complexity to address current challenges in innovation systems: A novel empirical strategy linked to the territorial dimension](#)

Many institutions use complexity analyses for country level macroeconomic analyses. However, we need to look at regional systems of innovation to better inform industrial policy. As most of innovation and industrial policy happens at the regional level, relevant policy instruments require understanding which regions are better prepared in terms of technological capabilities. This framework is designed to help policymakers identify knowledge-based investment priorities and the potential feasibility of the several options they have. It uses machine learning algorithms (developed within the economic complexity paradigm) to highlight which technologies and production lines may be feasibly developed by a region or a country, based on their current capabilities. It is a quantitative tool, whose aim is to provide orientation for policymakers from the early phases of the strategy design and throughout its implementation. Traditionally you (we) may have used patent analysis that relies on patent counting to infer the activity of a regional innovation system. Now, you have access to complexity analysis to grasp the technological fields your region is active in to infer its capabilities. With such analysis, you can describe the potential of the innovation system not just in terms of simple indicators, but also as a multidimensional analysis of the possibilities

of the region in different directions. You will be able to inform each region of their comparative advantage in different dimensions.

Focus on three dimensions of capabilities

- **Sectors:** Vertical technological capabilities at the sectorial level, identified by crossing patent and export data to highlight technologies leading to a comparative advantage in a specific export market.
- **Green sustainability:** Technological capabilities specific to the green effort of the Commission, identified through the Y classification of the EPO.
- **Key Enabling Technologies:** Transversal technological capabilities spanning different sectors, identified through expert opinion.

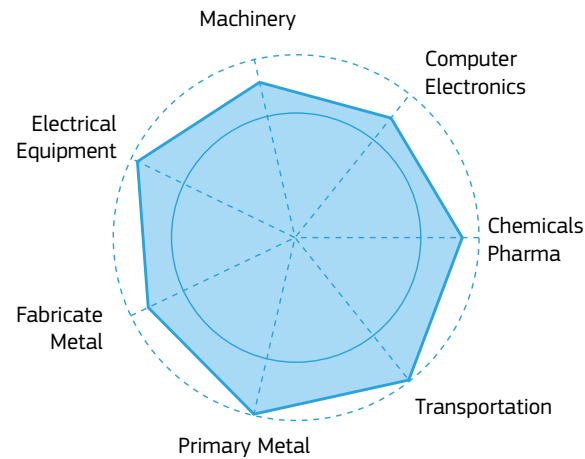
Identification of Green Technologies

The identification of industrial priorities and their connection to technological fields requires constant monitoring, as the institutional goals and the technological landscape evolve. To advance on this task, we are working on an automatic matching of patents with BREFs (Best Available Techniques reference documents) allowing connecting green priorities to technological fields at a very high level of disaggregation automatically and as fast as priorities updates.

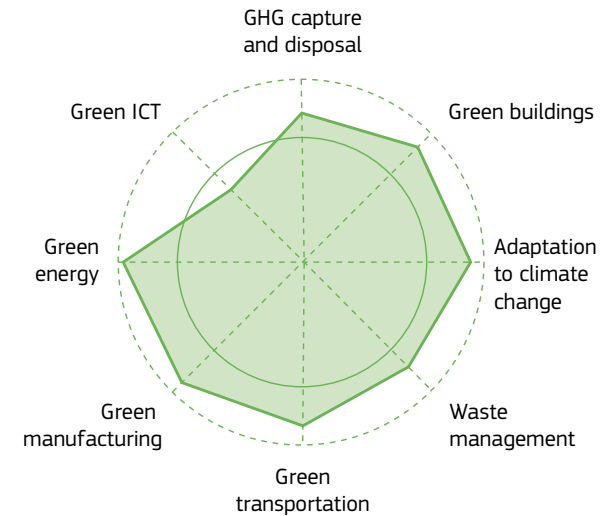
Priority compass in action: the case of Andalusia

The priority compass uses Complexity analysis to help policymakers select knowledge-based investment priorities at the regional level. The radar plot highlights areas where the region holds greater technological capabilities. The blue radar focuses on advanced manufacturing sectors, while the green and red radars focus on green and horizontal technologies, respectively. For each radar plot, the central circle represents the average technological capabilities of the region, which means the radar is underlying the relative technological capabilities, rather than the absolute ones. The radars can be used to evaluate the relative strengths and weaknesses of the region. This is aimed to inform policy makers, but it does not provide directly industrial strategies: it is up to the policymaker, for instance, to decide whether to focus investment in technologies where the region is strong or weak. We observe that in general Andalusian comparative advantage in advanced products is lagging behind, but they have an advantage in Primary Metal and Transportation. Andalusia holds relative strength in all green technologies except for Green ICT, while – for key enabling technologies – it is relatively well positioned in Nanotechnologies.

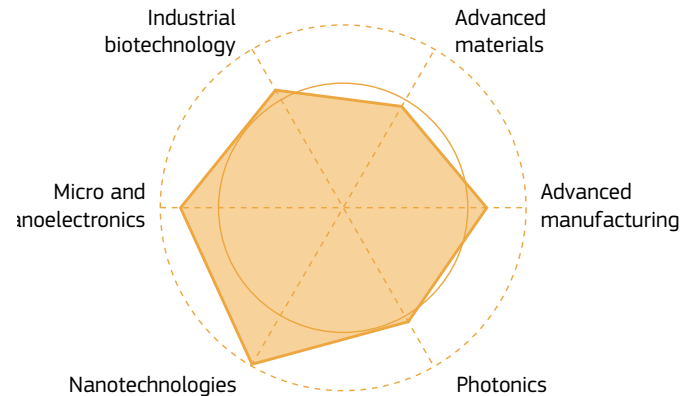
SECTORAL OPPORTUNITIES



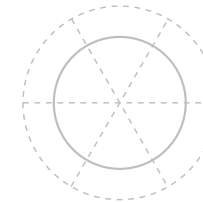
TECHNOLOGIES FOR SUSTAINABILITY



KEY ENABLING TECHNOLOGIES



The central circle represents the average technological capabilities of the region.



Compasses for Andalusia region, Spain.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Promoting multiple-value creation and co-benefits

PURPOSE Engaging different groups in innovation for multiple value creation

USE Explaining practical processes of creating multiple value creation and co-benefits

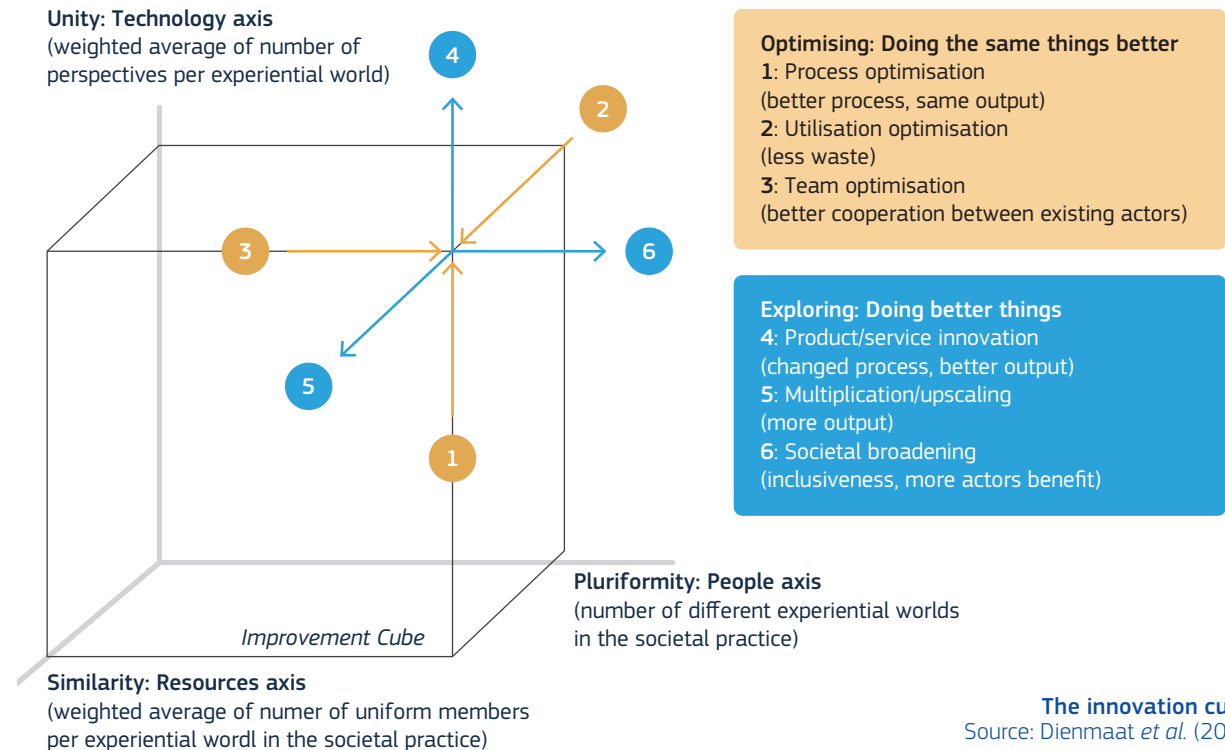
ACTIONBOOK ACTIVITIES Continuously engaging with stakeholders
Diagnosing and developing a vision
Developing transition pathways and roadmaps
Developing a strategy
Designing local missions

AUTHORS Dimitrios Pontikakis
(JRC-PRI-PILOT@ec.europa.eu)

MORE → [Vanguard Initiative](#)
→ [Why sustainable development requires societal innovation and cannot be achieved without this](#)
→ [Sustainable business model innovation: The role of boundary work for multi-stakeholder alignment](#)

Collaborative working is key in the recovery process of the pandemic and in the generation of resilient value chains. This approach offers new innovation opportunities which would not be achieved through change-makers working in isolation. This also provides stimulus to explore new commercial openings. An innovation framework of value orientations and player-based improvement perspectives leads to societal innovation which serves multiple needs and functions in a novel manner. It targets society in a broad sense more than a particular sector. Transition policy mixes include elements of creative destruction, involving policies for the creation of the new and for destabilising the old. Societal innovation involves different stakeholder groups bringing in different perspectives with the aim of creating value and avoiding negative costs to society. It works as a

multi-player innovation challenge leading to co-benefits. Turning our current production-consumption systems into sustainable systems while maintaining their societal benefits requires the involvement of consumers, governments, companies, knowledge institutes and intermediaries. Respecting differences by considering them as flexible components of a process is key in intentional multi-player networks. Innovators need to acknowledge that they require each other in fulfilling their own needs. Take for example the Innovation Cube as a guide with its six value orientations. Ask yourself whether your goal is to improve current practices (incremental innovation) or if you want to explore new avenues (radical innovation). This collective system building can lead to faster diffusion and adoption of the new practices.



The innovation cube.
Source: Dienmaat *et al.* (2020)

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Promoting public sector innovation

PURPOSE Promoting innovation for societal goals

USE Developing faster, more efficient solution to public policy challenges

ACTIONBOOK ACTIVITIES Setting up a network governance
Setting milestones and targets
Managing and transforming knowledge

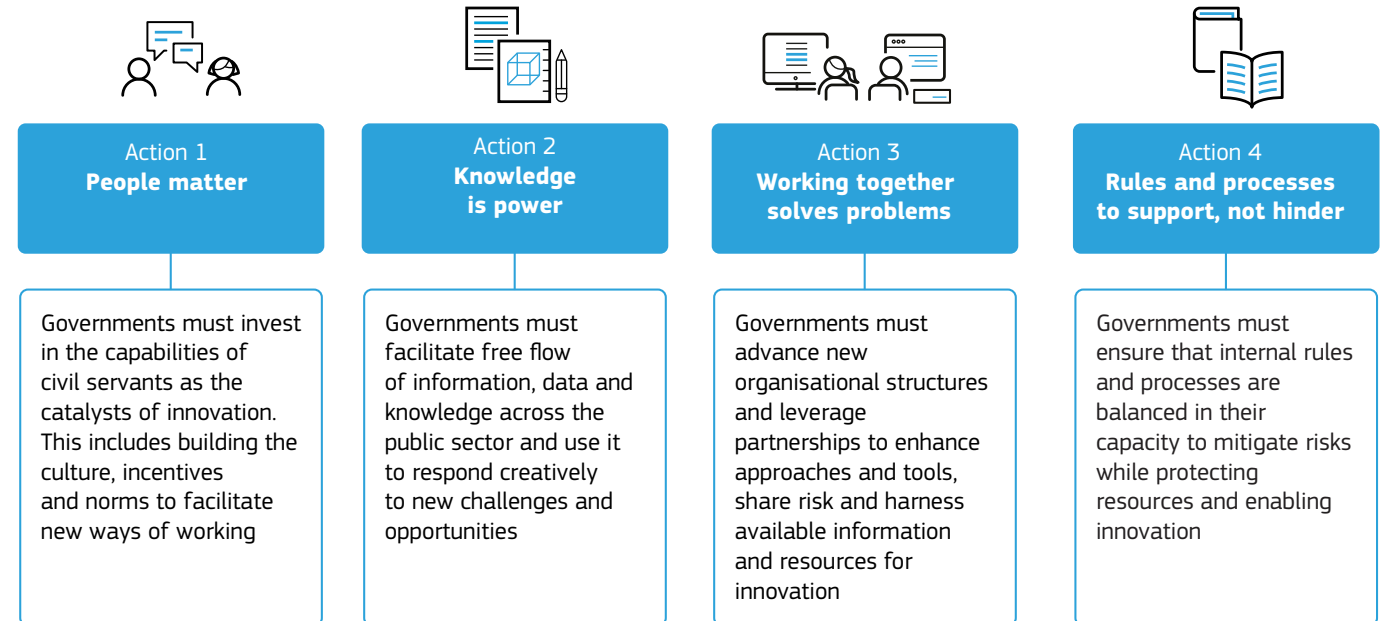
AUTHORS Dimitrios Pontikakis
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MORE → [OPSI Publications - Observatory of Public Sector Innovation](#)
→ [Innovations in public governance](#)

In both business and the public sector, innovation can be key to fostering prosperity, to reducing costs and improving services. Public sector innovation is defined by the European Commission as the process of generating new ideas, and implementing them to create value for society. Each public innovation addresses a public policy challenge, and a successful public innovation is one that achieves the desired public outcome. Fostering innovation in public organisations requires changes that encourage organisations and the people that work for them to come up with new ideas, try new approaches and work in new ways.

There are two main categories of public sector innovation: innovation in and innovation through the public

sector. While the first mostly describes the modernisation of public services to render them more citizen- and business-friendly, the latter focuses on large-scale high-cost and high-risk innovations where the business sector was initially reluctant to invest, such as space technology or nanotechnology, transport (e.g. high-speed trains), or digital infrastructure (e.g. the internet). People are at the heart of both types of public sector innovation. Be supportive of your colleagues and employees – that is, make sure they have the competences, motivation and opportunity to come up with new approaches (see T13 Empowering civil servants to create sustainable prosperity).



Four action areas to promote public sector innovation:

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Public-private partnerships for skills development

PURPOSE Developing the skills that individuals need in a greener and digital society

USE Connecting public and private stakeholders for effective implementation of skills-related policies

ACTIONBOOK ACTIVITIES [Designing ecosystem support](#)
[Coordinating the policy and action mix](#)
Mobilising competences

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MORE → [Public-private partnerships for skills development. Vol. I](#)
→ [Public-private partnerships for skills development. Vol. II](#)
→ [Youth guarantee implementation](#)

To ensure that young people and adults are employable, systems of vocational education and training (VET) around the world build various forms of collaboration between the public and private sectors. Public-private partnerships (PPPs) that focus on skills development are one form of collaboration found in any VET system. Player cooperation and public and private investments are important factors to make lifelong learning a reality for all.

PPPs in the field of skills can be useful instruments of skills policies and programmes, to attain positive outcomes for learners. These PPPs are a space where public and private stakeholders come together with their respective competence, innovation capacity, human and material resources to enable what none of them could achieve alone (see box below).

PPPs for skills development feature 3 dimensions, namely function, scope and membership. In terms of function, we find:

- PPPs that focus on knowledge, for example skills intelligence and data analysis, context and demand analysis, and foresight;
- PPPs that focus on resources, for example learning equipment, laboratories, dormitories;

- PPPs that focus on VET provision are the most frequent, for example: various forms of work-based learning programmes, joint curriculum and programme design and delivery, joint management of training centres, innovation of learning environments, transition from school to work, up-skilling and re-skilling.

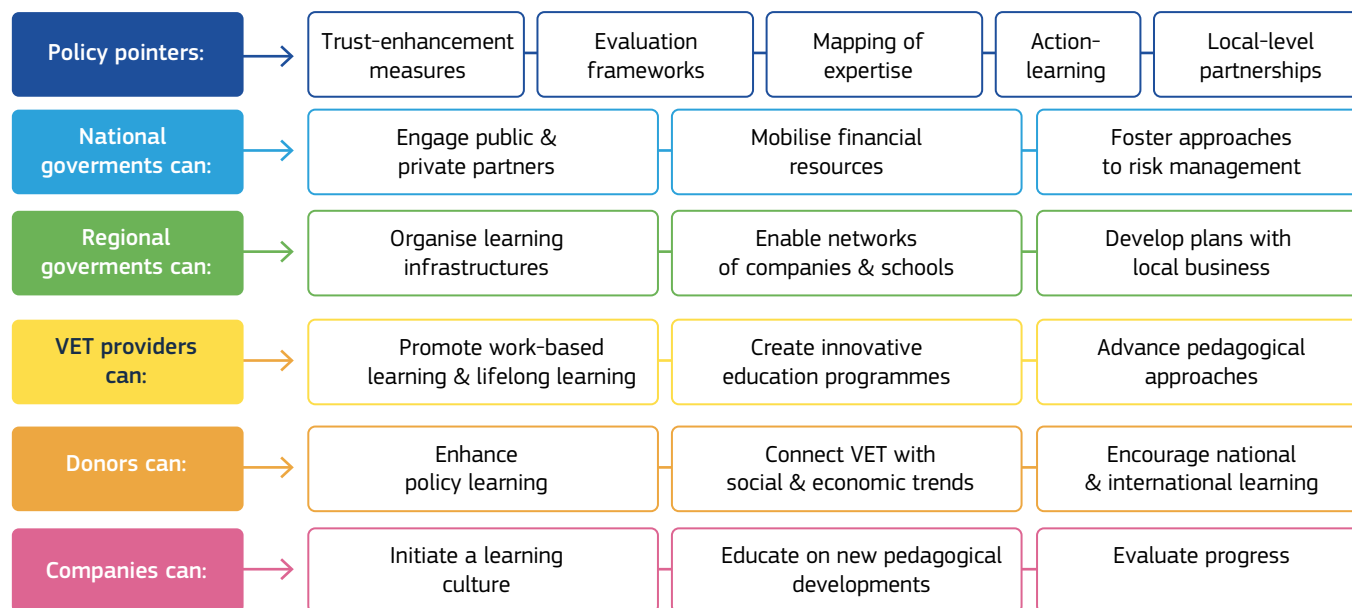
In terms of scope, the PPP types range from ‘fully integrated in the VET system’ to ‘ad hoc pilot initiative’ depending on the extent of diffusion of the practice within the VET system.

Finally, in terms of membership the PPP types depend on the openness to new partners joining, which can vary from ‘open’ or ‘semi-open’ to ‘closed’ PPPs.

You can find evidence from 23 case studies in a report by the European Training Foundation. It analyses the purpose of the partnerships, their scope and membership, governance, financing and risk management arrangements, as well as the motivation, role and capacities of the partners. This ETF report shows that PPPs for skills development do not exist in a vacuum but build on conditions and are influenced by contextual factors. The following graph summarises what public institutions, companies, schools and training centres as well as donors can do to sustain PPPs that serve skills development purposes.

What are public-private partnerships for skills development?

PPPs for skills development are mechanisms for coordinating action and sharing responsibility between public and private stakeholders in VET. They jointly formulate, design, finance, manage and/or sustain engagements that produce good quality skills and employability for the learners. Stakeholders in PPPs may include public institutions or semi-public organisations, such as schools, agencies and state enterprises, and individual businesses, associations, chambers of commerce and civil society organisations. PPPs on skills development may unfold at the school/company level, within or across sectors, at the national or sub-national scale.



Public-private partnerships for skills development.

Source: European Training Foundation

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Regional exports: value added and employment content

PURPOSE Providing a useful analytical tool to understand the economic potential of EU regions

USE Monitoring and analysing value added and employment content by industries in the regions

ACTIONBOOK ACTIVITIES Managing and transforming knowledge
Continuous monitoring
Evaluating impact

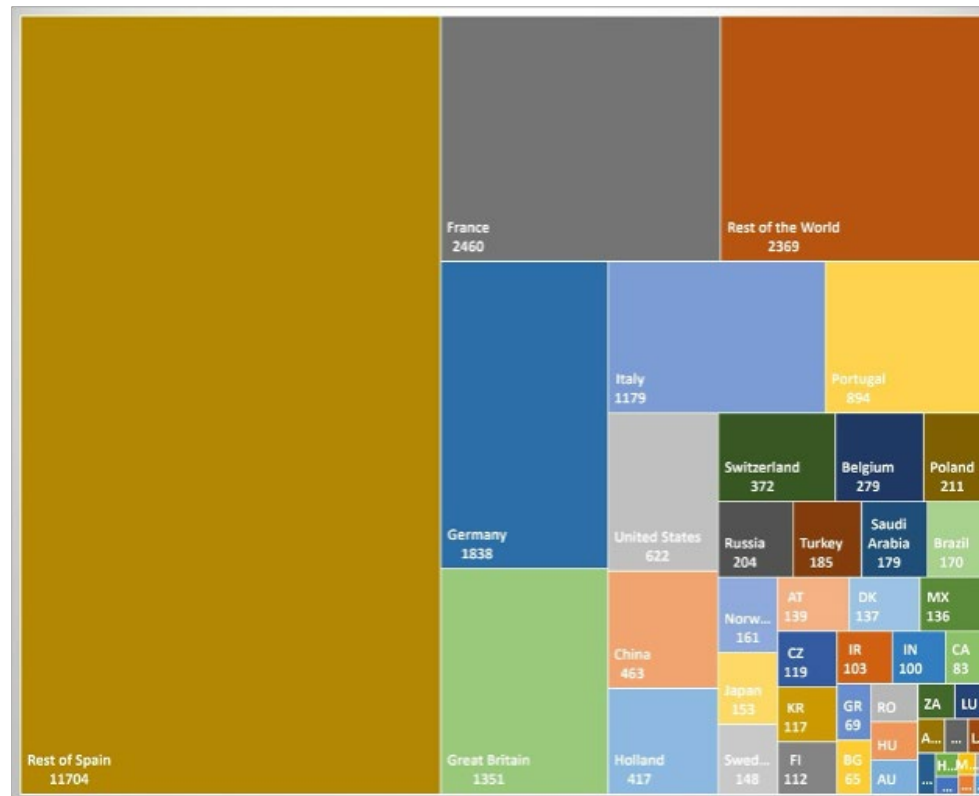
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MORE → [European Union inter-country supply, use and input-output tables — Full international and global accounts for research in input-output analysis \(FIGARO\)](#)
→ [New Indicators on Integration of Global Value Chains in Employment and the Economy of Andalusia](#)

The volume and complexity of the (regional, national and international) trade of goods and services has recently increased on a global scale. When looking into territorial economies, it is necessary to know to what extent each territory participates in the processes, and their impacts (environmental, social and economic), of different value chains. The traditional indicators, based on gross imports and exports, are insufficient for this purpose. First, they do not include net inputs in terms of value added or employment. Second, they do not account for more than the direct effect of trading links in the economy without singling out the indirect effects on other upstream supplying industries in regions. Therefore, we need the use of Input-Output analysis and multi-regional input-output tables, to estimate the value added and employment content of regional exports and

the final demand of regions. With FIGARO Input-Output tables, together with regional accounts data from the corresponding regional statistical office, it is possible to estimate by detailed industry granularity the value added content of regional exports (by trading partner) and the final demand of regions. If data on regional employment and emissions were also available, this methodology could also estimate the employment and environmental content of regional exports and final demand of regions. In this example for Andalusia (Spain), it is possible to disaggregate the indicators separating their trading links respect the rest of Spain, the EU or the rest of the world, using official regional statistical information while other countries remained unchanged. By doing so, standard input-output analysis can be done in order to quantify how much Andalusian value added

content there were in the Andalusian exports (e.g. of food products) to the rest of Spain, China or other EU country. This case study can be extrapolated to any particular regional analysis within the EU provided the appropriate support from the regional government and, in particular, its statistical office. The knowledge of these indicators can add additional information for the regions about the employment, environmental or capital resources contained in exports distinguishing by countries or regions and the value of imports within exports, shedding light to the weaknesses and strengths of one region in the global value changes.



Andalusian value added in exports by country of destination (Mill. Euro)

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Regional Innovation Valleys

PURPOSE Bridging the innovation divide and spreading Europe's leadership in innovation

USE Strengthening and advancing European innovation ecosystems, connecting all EU territories to respond to societal challenges and fostering stronger cohesion

ACTIONBOOK ACTIVITIES **Setting milestones and targets**
Enabling multilevel cooperation
Collaborating across departments
Collaborating across territories
Developing a strategy

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Magdalena Cymerys

MORE → [Regional Innovation Valley - Matchmaking map](#)



EU regions, irrelevant of their innovator-performance level, need to invest collectively with other regions during the next wave of innovation in a highly competitive, volatile and ever-changing geopolitical context. The Regional Innovation Valleys (RIVs) initiative aims to create clusters of regions with different levels of innovation to support the development of a strong and diversified European ecosystem by creating interregional innovation projects including in deep tech innovation, linked to key EU priorities such as food security, energy, health, circular economy, and digitalization as defined in the New European Innovation Agenda (NEIA). RIVs have an ambition to secure the EU leadership in the innovation trend by financing and broadening of the value chain in specific domains. Matchmaking with different partners will benefit access to new talent, knowledge and networks that are fundamental to create a robust innovation ecosystem. RIV is a bottom-up instrument bringing together cohesion and innovation policies, and the lessons to be learnt in this current pilot will be crucial for further design of upcoming calls. This initiative was de-

signed as part of Flagship 3 of NEIA on Accelerating and strengthening innovation in European Innovation Ecosystems across the EU and addressing the innovation divide. RIVs aim to create connections that involve regions with lower innovation performances by building on strategic areas of regional strength and specialisation as indicated in their respective smart specialisation strategies. Until now, the European Commission has launched a Call for expression of interest enabling regions to express their interest to become RIV and work together. In addition, two complementary calls have been launched where the European Commission dedicated EUR 122 million under Horizon Europe (European Innovation Ecosystems) and under the European Regional Development Fund (Interregional Innovation Investments (I3) Instrument). To facilitate matchmaking and interconnections, the European Commission created a Matchmaking Map displaying regional authorities committed to tackle the most burning social challenges, as defined in NEIA.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Regulatory sandboxes

PURPOSE Allowing experimentation of new innovative developments in a controlled-risk environment with relaxed regulations

USE Creating cutting-edge products and services and maintaining competitive advantage

ACTIONBOOK ACTIVITIES [Deploying a strategy](#)
[Experimenting and demonstrating](#)
Learning from experimentation

AUTHORS Solange Mifsud
(JRC-PRI-PILOT@ec.europa.eu)
Andrea Renda

MORE → [European blockchain regulatory sandbox for Distributed Ledger Technologies](#)
→ [European regulatory sandbox for blockchain](#)
→ [Regulatory sandboxes in artificial intelligence](#)
→ [Supporting FinTech innovation in the Czech Republic](#)

Regulatory sandboxes are real-world testing environments where conditional exemptions from regulations currently in force allow rapid experimentation, learning and innovation. Lessons from these “structured contexts for experimentation”¹ may then provide the basis for informed adjustments of laws and rules. Sandbox experiments are typically not about the demonstration of one innovation, but rather involve bringing together various stakeholders in the development and testing of in-

terrelated innovations. Regulatory sandboxes require the introduction of a compatible legal framework and a regulatory authority (e.g. an independent energy regulator, or a telecommunications, transport, food safety or data protection oversight body) to approve exemptions from prevalent rules for a limited time and for well-defined purposes, providing safeguards and oversight to minimize risks.

Potential benefits of Regulatory sandboxes

To regulators	To innovators	To consumers
Inform long-term policy making through learning and experimentation	Reduce time to market by streamlining the authorisation process	Accelerate the introduction of new and potentially safer products
Signal commitment to innovation and learning	Reduce regulatory uncertainty	Enlarge the pool of consumers who can access improved products and services
Promote communication and engagement with market participants	Gather feedback on regulatory requirements and risks	
Update regulations that may prohibit beneficial innovation	Improve access to capital and remove market-entry barriers for businesses (SMEs and start-ups)	

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Developments at EU regulatory level

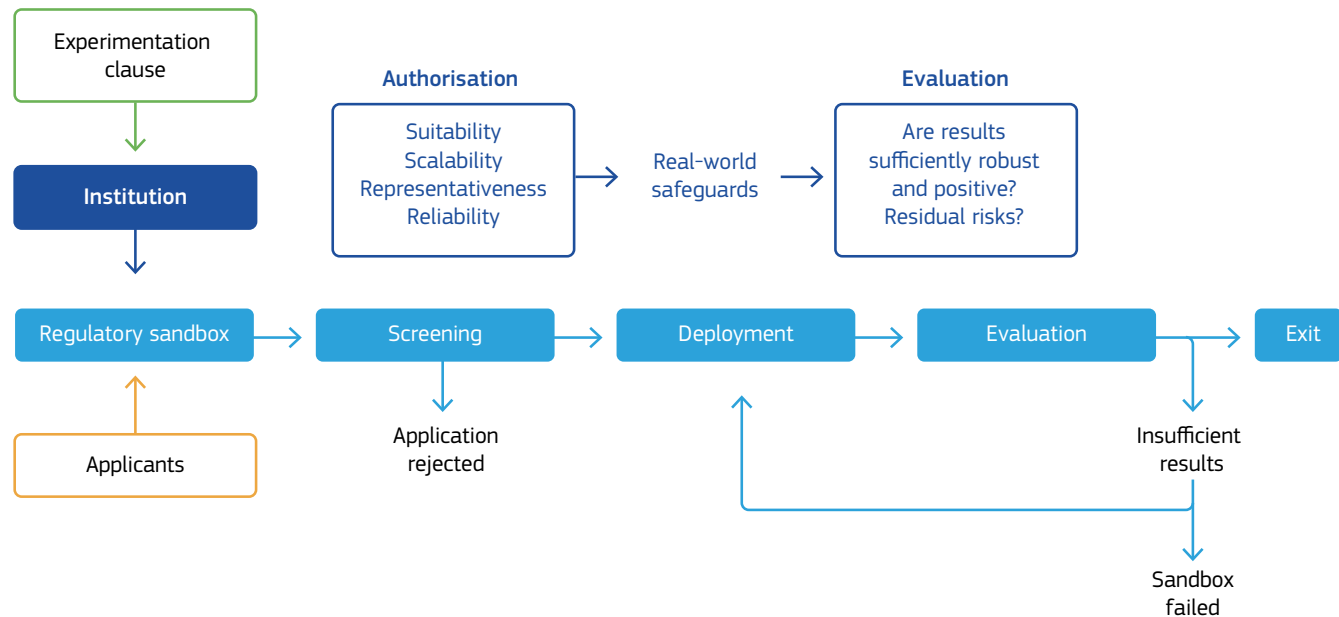
In February 2023 the European Commission launched the European Regulatory Sandbox for Blockchain which is supported by the Digital Europe Programme and delivers on the SME Strategy². It will run from 2023 to 2026 and aims to be a pan-European framework for regulatory dialogues in developing innovative cases in any blockchain infrastructure. It provides legal certainty for decentralised technology solutions and allow regulators and supervisors to ameliorate their knowledge on

cutting-edge blockchain technology. Every year of this initiative, the most innovative regulator participating in the regulatory sandbox will also be awarded a prize. The European Blockchain Regulatory Sandbox cooperates with other relevant sandbox frameworks, particularly with the EU Digital Finance Platform³ and the Artificial Intelligence Sandbox once this will be established under the AI Act⁴.

Guidance for sandbox design and implementation

The figure below shows a possible step-by-step guidance to designing and executing a regulatory sandbox. First, regulatory sandboxes require that an experimentation clause is included in legislation, allowing public institutions to design and implement experimental policymaking in a controlled environment. A given institution then opens up the possibility for businesses aiming at a change in legislation to apply to enter a regulatory sandbox environment. This is typically the case of highly regulated sectors including financial services, energy, transport and health., and which makes it difficult for an applicant to fully meet the legislative

requirements with the adoption of a new innovative business model. Applications have to be assessed based on the potential benefit of allowing the innovative solution, the scalability of potential positive results, the representativeness of the sample of consumers/users chosen, and the reliability of the experimental design. Once the application is authorised, the deployment phase begins, possibly requiring several iterations before results are considered to be robust enough to allow for admission of the innovative solution to the market.



Designing and implementing a regulatory sandbox. Source: elaborated by Andrea Renda.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

S3 for SDGs: How to embed sustainability and the SDGs in S3

PURPOSE Strengthening sustainability dimension and integrating SDGs in S3

USE Assisting policy practitioners in designing and implementing sustainability-oriented S3

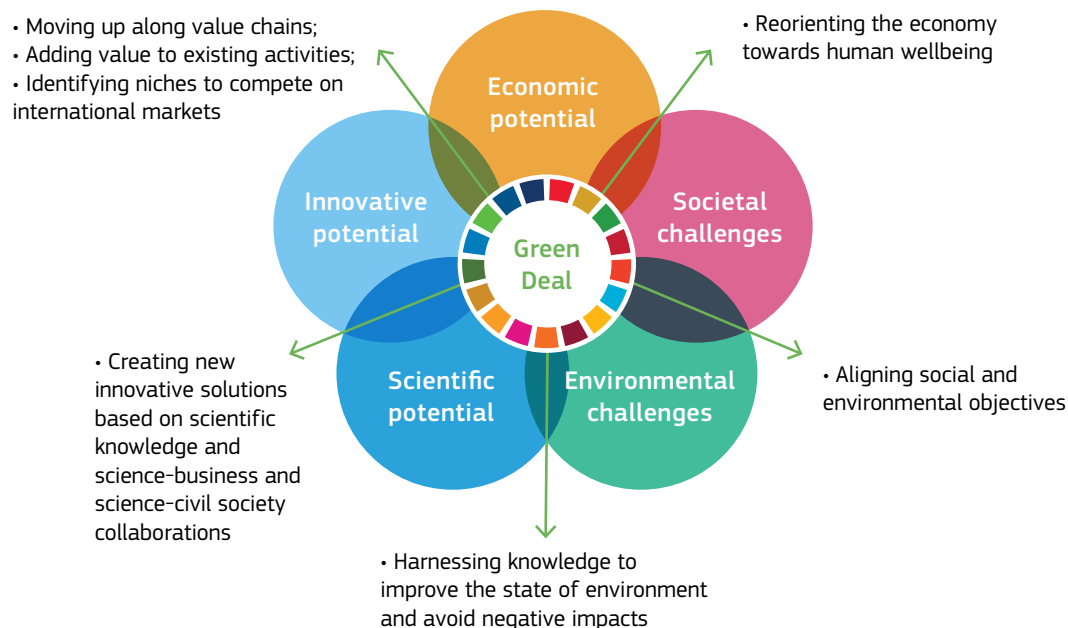
ACTIONBOOK ACTIVITIES Agenda setting and sharing
Developing a strategy
Deploying a strategy

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Angela Sarcina

MORE → [Reflection framework](#)
→ [S3 and environmental commons](#)
→ [Theoretical and conceptual background](#)

Smart Specialisation for Sustainable Development Goals (S3 for SDGs) is a concept and a methodological approach embedding sustainable development and the Sustainable Development Goals (SDGs) in the whole policy cycle of smart specialisation strategies, from design to monitoring and evaluation. The rationale of S3 for SDGs is that research and innovation can foster economic development whilst addressing wider social and environmental sustainability challenges faced by territories. The approach illustrates how S3 can evolve to focus on supporting transformative innovation and sustainable development. S3 for SDGs proposes to localise global challenges to make them understandable and meaningful for different territorial contexts and local communities. The approach helps to mobilise new stakeholders and build new partnerships to support

challenge-oriented experimentation and innovation. Together with experts and S3 practitioners, the JRC developed a reflection framework to help policymakers integrate sustainability challenges and goals in S3 at regional and national levels. The framework is designed to guide a reflection on the implications and challenges of integrating sustainability challenges and the SDGs in each step of S3. The tool is based on an extensive literature review and a co-creation process that engaged more than 30 policy practitioners from 11 regions and countries from the EU and beyond. The framework builds on diverse experiences of the territories invited to participate in the co-creation exercise. New dimensions of S3 for SDGs call for broader engagement of stakeholders and systemic consideration of synergies and trade-offs of research and innovation.



New dimensions of Smart specialisation for SDGs call for broader and more systematic considerations of synergies, trade-offs and relevant stakeholders. Source: Nakicenovic et al. (2021)

S3 components and questions to guide reflection

DIAGNOSIS: ANALYSING THE INNOVATION POTENTIAL	GOVERNANCE: SETTING OUT THE S3 PROCESS AND GOVERNANCE	VISION: DEVELOPING A SHARED VISION AND SCENARIOS	PRIORITIES: TOWARDS CHALLENGE-LED EDP AND S3 PRIORITY AREAS	DEFINING AN ACTION PLAN WITH A COHERENT POLICY MIX	MONITORING AND EVALUATION (M&E)
<p>Does the diagnosis include evidence on current and potential future impacts and risks for your region or country associated with global environmental and societal challenges for the economy, society and natural environment?</p> <p>Does the analysis of the existing specialisations and competitive assets of your region or country include evidence and reflection on the strengths and weakness of actors, institutions and infrastructures to adapt and innovate to address sustainability challenges and the SDGs?</p> <p>How are various types of scientific evidence, qualitative and quantitative research methods and sources of expertise on sustainability challenges and opportunities collected and interpreted to support the design and implementation of Smart Specialisation?</p> <p>Does the diagnosis consider diverse perspectives on the societal challenges, including from previously not involved or marginalised groups?</p>	<p>Do the design, implementation and monitoring of S3 ensure a broad, inclusive and continuous participation of stakeholders relevant to the sustainability transformation of your territory?</p> <p>What are the specific arrangements for identifying and addressing the risk of capture of the process by dominant incumbents who impose their perspectives on sustainability transition or are less concerned with sustainability objectives?</p> <p>Are there governance mechanisms within and across public and private sectors that allow the identification and generation of inter-institutional synergies between policies, instruments and budgets?</p>	<p>What is the importance of sustainability challenges and the SDGs in the S3 vision and visions underpinning other relevant development strategies of your region or country?</p> <p>How is desirable future portrayed in the S3 vision? What is the relative importance of economic, social and environmental dimensions in the vision?</p> <p>Is the vision known and shared by the key stakeholders?</p> <p>Does S3 include a reflection on alternative development scenarios and transition pathways to explore the role of research and innovation in achieving sustainability goals? Does the reflection on alternative pathways consider their potential economic, social and environmental impacts?</p>	<p>Were societal challenges taken into account in the definition of your S3 priority domains? If yes, how do they address sustainability challenges and the SDGs?</p> <p>What are the incentives, drivers and barriers for including sustainability-related specialisation areas and objectives, including the SDGs, in the S3 priorities?</p> <p>How do you balance top-down goals and bottom-up perspectives in selecting and shaping your priority domains? What is the role of EDP in this context?</p> <p>Do any of the selected S3 priorities focus on existing or emerging niches with a potential to experiment, demonstrate or scale transformative innovation with an ambition to address sustainability challenges and the SDGs in your region or country?</p>	<p>Would you describe your S3 as challenge-led or mission-oriented? Has the inclusion of sustainability challenges in S3 resulted in specific objectives and led to changes in the selection and design of instruments and supported activities?</p> <p>Does the action plan include instruments designed to support experimental and transformative innovation focused on sustainability challenges?</p> <p>What are the barriers and drivers to developing and implementing instruments supporting sustainable innovation in your region and country? How can you introduce them without disrupting parts of the innovation eco-system that have proven to work well?</p> <p>Does the S3 action plan include coordination mechanisms to ensure internal coherence of S3 and external synergies between S3 and other relevant policy areas? Is there a wider framework in your region or country to support policy coherence and directionality towards sustainability?</p> <p>Are the action plan designed to ensure corrective measures are taken to adjust the plan and instrument design based on the continuous process of entrepreneurial discovery and insights from M&E?</p>	<p>Does the S3 monitoring and evaluation (M&E) system allow you to identify and analyse sustainability outcomes and impacts of research and innovation instruments? Have you considered how such outcomes can be measured?</p> <p>Is there evidence of innovation and experimentation supported by S3 in your region or country that created considerable sustainability benefits or unintentionally generated negative social or environmental impacts? What are these impacts and has corrective action been taken?</p> <p>Do the M&E include methods, indicators and processes designed to capture transformative outcomes of supported projects such as social learning, behavioural change, or technology substitution?</p> <p>Do M&E processes encourage continuous learning from S3 experiments and implementation? How are lessons from evaluation communicated to and between departments?</p> <p>Does the M&E system ensure continuous participation and feedback from and between key stakeholder groups and civil society? What are the links between M&E and the EDP?</p>

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
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european

S3: Smart specialisation strategies

PURPOSE Providing an outline of the s3 concept and its perspective

USE Developing smart specialisation strategies

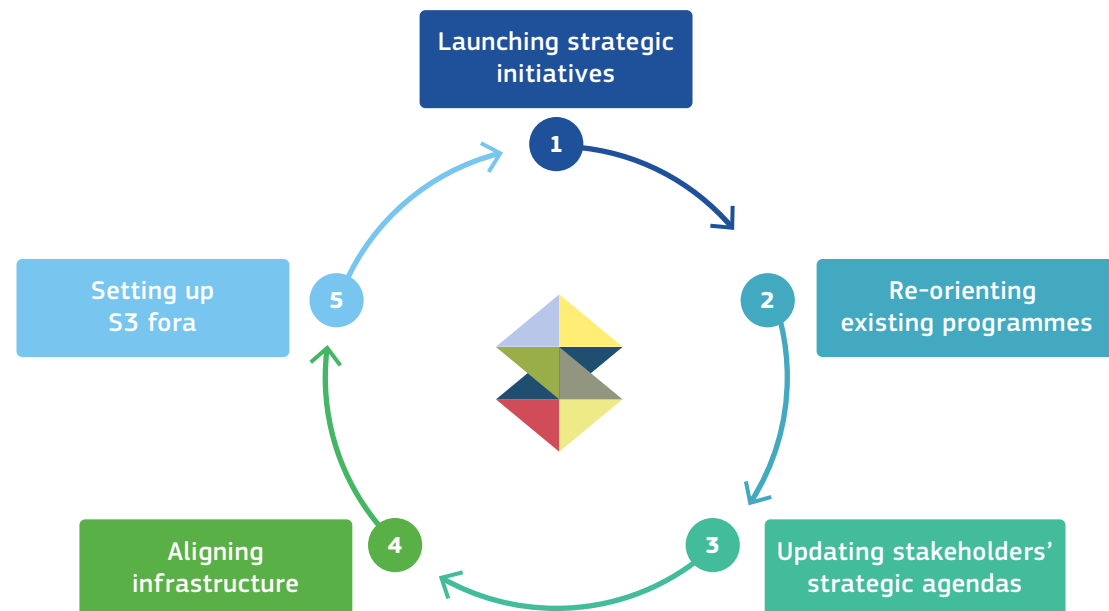
ACTIONBOOK ACTIVITIES Continuously engaging with stakeholders
Diagnosing and developing a vision
Developing a strategy
Deploying a strategy

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Carmen Sillero Illanes
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MORE → [S3 Community of Practice](#)
→ [Smart Specialisation Platform](#)
→ [European Regional Development Fund](#)
→ [Smart Specialisation Strategies and Regional Productivity](#)

Smart Specialisation Strategies (S3) are regional innovation strategies established for a more effective use of Cohesion Funds in the 2014-2020 programming period. They became an ex-ante conditionality whereby the design of a smart specialisation strategy (S3) was a prerequisite to access the European Structural and Investment Funds devoted to research, technological development and innovation, and maintained for the 2021-2027 period as a so-called enabling condition. They aim at focusing R&I efforts on a limited number of priorities based on an assessment of opportunities of the regions and full involvement of local stakeholders (mainly business, research organisations and the public sector) via an entrepreneurial discovery process. The S3

experience reshaped the innovation policy process as illustrated below. S3 has promoted a methodical approach to regional economic development. Furthermore, S3 has enhanced participatory governance in the identification of priorities and the overall design, as well as in the implementation of the strategy, leading to a more open, market-oriented and inclusive decision-making process. S3 has led to a cultural change in many regions, territories and Member States. The Smart Specialisation Community of Practice (S3 CoP) is the central node on guidance, networking, support and peer-learning on S3, covering its conceptual development and its implementation in the EU. The S3 Platform (S3P) covers implementation of smart specialisation outside the EU.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
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european

Science, Technology and Innovation for the SDGs roadmaps

PURPOSE Mobilising the innovation potential to address localised sustainability challenges

USE Providing tailor-made guidance for the design of STI for SDGs roadmaps

ACTIONBOOK ACTIVITIES [Diagnosing and developing a vision](#)
[Developing transition pathways and roadmaps](#)
[Developing a strategy](#)
Learning from experimentation

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Michal Miedzinski, Pierre Rialland

MORE Background on STI for SDGs roadmaps
→ [Guidebook for the Preparation of STI for SDGs Roadmaps](#)
→ [Overview of the existing STI for SDGs roadmapping methodologies](#)
Examples of STI for SDGs roadmaps
→ [Progress Report of the Global Pilot Programme on STI for SDGs Roadmaps](#)
→ [Pilot methodology for mapping SDGs in the context of Smart Specialisation Strategies](#)

Science, technology and innovation (STI) can accelerate progress to address sustainability challenges underpinning the SDGs and the European Green Deal. STI for SDGs Roadmaps are conceived as strategic policy frameworks for action that can mobilise STI to achieve place-based sustainability challenges. Roadmaps are an interface aligning key national strategies and policies, including national development plans and STI policies, with the SDGs priorities. They focus on the identification of the STI priorities to address key societal, environmental and economic challenges in line with the SDGs.

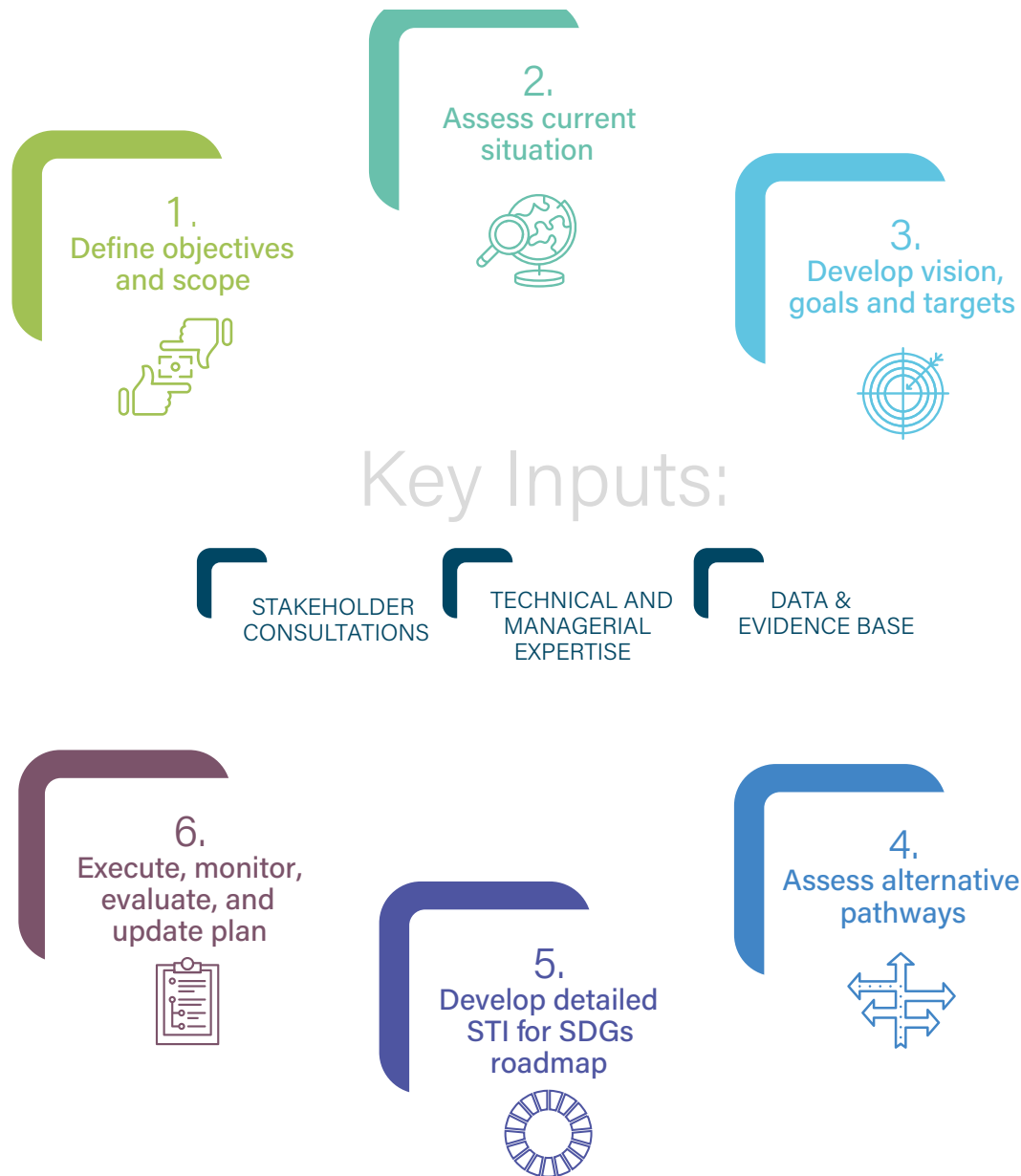
The JRC approach builds on the experience on S3, and supports the design of roadmaps based on extensive quantitative and qualitative analysis. The analysis identifies local sustainability challenges and assesses the potential of the STI system to address them. It relies on foresight activities by considering different pathways to tackle a given sustainability challenge, and makes use of participative processes and co-creation principles to strengthen ownership and fostering capacities of local stakeholders. As an outcome, the approach aims to embed a stronger directionality of STI policies by focusing on sustainability-oriented goals that can guide future investments in research and innovation.

The JRC provides methodological guidance for the development of STI for SDGs roadmaps. This guidance is modular and tailor-made to fit the country's context and needs. It is based on the six steps to develop STI for SDGs roadmaps as defined by international experts contributing to the work of the United Nations Inter-Agency Task Team on STI for SDGs (figure in the next page).

• Step 1: Define objectives and scope – JRC provides

guidance through brainstorming and understanding of the need for STI for SDGs Roadmaps, capacity assessment and capacity building. In this phase, JRC also supports policy makers in understanding the roadmap's placement within the broader national policy context.

- Step 2: Assess the current situation – JRC support includes, among others, the identification of synergies with other policies, analysis of statistical indicators to identify the existing STI potential and identify pressing sustainability challenges.
- Step 3: Develop vision, goals and targets – JRC facilitates the achievement of consensus on goals and targets through stakeholders' validation of STI priority domains.
- Step 4: Assess alternative pathways – JRC helps to consider various transition pathways through analytical and participatory foresight approaches, including horizon scanning and scenario analysis.
- Step 5: Develop detailed STI for SDGs roadmap – JRC assists in the definition of the policy mix providing guidance to strengthen the directionality and consistency of STI policy with the SDGs and ensuring the mise-en-place of coordination mechanisms to ensure policy integration.
- Step 6: Execute, monitor, evaluate, and update plan – JRC support includes the definition of sound M&E mechanisms that take into account direct and indirect socio-economic and environmental outcomes of STI roadmap, while ensuring iterative monitoring aimed at learning and continuous adjustment processes.



Flowchart of six key steps in developing STI for SDGs roadmaps

Source: United Nations Inter-Agency Task Team on STI for SDGs and European Commission, JRC, 2021.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Small-scale experimentation for transitions

PURPOSE Nurturing and experimenting with co-evolution of technology, user practices, and regulation

USE Creating protected niches to address a societal challenge

ACTIONBOOK ACTIVITIES

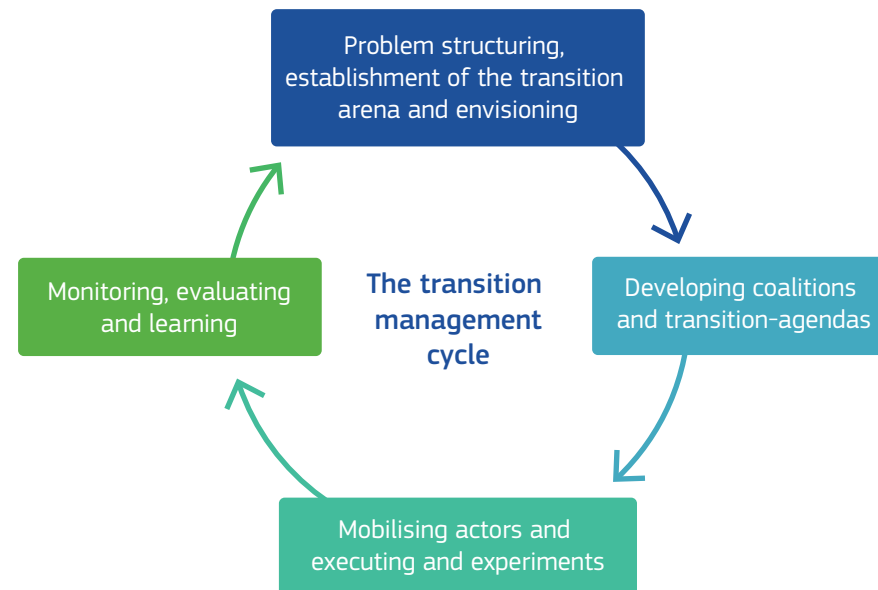
- Diagnosing and developing a vision
- Developing transition pathways and roadmaps
- Experimenting and demonstrating
- Learning from experimentation

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MORE → [Deepening, Broadening and Scaling up - A Framework for Steering Transition Experiments](#)

Creating modular protected spaces, or niches, for experimentation can facilitate sustainable transitions as they are guided by broad societal needs. Such spaces recognise that technological and social change are interrelated. They thus allow to experiment the co-evolution and alignment of new technology together with user interactions, new social practices, financial and regulatory structures, and sustainability goals. Some examples include experimentation to address water management, mobility in urban areas, and access to food. You should use niche for transition experiment together with other concepts and tools, such as directionality complex sys-

tems analysis, transition pathways, shared agendas, monitoring and evaluation, WoG approach and stakeholder engagement. To create transition experiment niches, you can focus on identifying and framing local problems for your region and create shared visions by being flexible yet ambitious. If short term goals are not met, the plan(s) should change rather than goals. You can promote shared agendas and work with stakeholders to create networks and coalitions to act upon shared strategies. Failure is part of the process and is needed to learn. You should also make sure to monitor and evaluate progress towards a shared vision.



Distinctive characteristics of transition experiments.

Source: Loorbach and Rotmans (2006)

	Classical Innovation Experiment	Transition Experiment
Starting point	Possible solution (to make innovation ready for market)	Societal challenge (to solve persistent societal problem)
Nature of problem	A priori defined and well-structured	Uncertain and complex
Objective	Identifying satisfactory solution (innovation)	Contributing to societal change (transition)
Perspective	Short and medium term	Medium and long term
Method	Testing and demonstration	Exploring, searching and learning
Learning	1st order, single domain and individual	2nd order (reflexive), multiple domains (broad) and collective (social learning)
Actors	Specialised staff (researchers, engineers, professionals, etc.)	Multi-actor alliance (across society)
Experiment context	(Partly) controlled context	Real-life societal context
Management context	Classical project management (focused on projects goals)	Transition management (focused on societal 'transition' goals)

A transition experiment is an innovation project with a societal challenge as a starting point for learning aimed at contributing to a transition.

Transition niche can become established once the problem is addressed in a fair and responsible manner, and design and demands have stabilised. Governments can favour niche creation for example through subsidies. Yet it is a broader community made of engineers, scientists, policy-makers, citizens, users and other interested groups that should engage in a bottom-up approach. Should you need any benefits of transition experiments, take a look at left Panel above.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Strategic intervention logic

PURPOSE Aligning strategic aims to stakeholder capabilities, resource allocation and expected results

USE Ensuring that each decision is taken on evidence-based information

ACTIONBOOK ACTIVITIES
[Diagnosing and developing a vision](#)
[Setting milestones and targets](#)
[Developing a strategy](#)
[Evaluating impact](#)

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MORE → [An intervention-logic approach for the design and implementation of S3 strategies](#)

A strategic intervention-logic approach is a six-step cascade process to identify solutions to territorial challenges by involving all stakeholders when making decisions over strategy adoption. This approach relies on the following: (1) all stakeholders share their data, ideas, expertise and expectations; (2) a documented assessment of the ecosystem can lead to a better selection of the next generation of activities and investments; (3) the proof of the available capabilities is used to demonstrate that stakeholders are able to deliver what they promised, (4) the expected results are taken into consideration to adopt a distribution grid for allocating financial and human resources (reverse action plan); (5) a clear description of what is expected from policy makers and stakeholders at each step reinforces the governance value chain, and (6) a permanent feedback system regarding the achievements and changes in the ecosystem is put in place to ensure constant monitoring and continuous improvement. With such approach, stakeholders are able to define their role in strategy implementation and hence, effectively deliver what they promised to achieve.

The concept of Smart Specialisation is rooted in the utilisation of the assets and resources that a territory can mobilise to address socio-economic challenges. The assessment of territorial capacities and capabilities is a precondition for any strategy design. An analysis of the territorial research and innovation capacities, existing infrastructures and equipment, and human capital is crucial to establishing the framework conditions. This assessment of the place-based assets aims to ensure that regional stakeholders involved in the S3 Entrepreneurial Discovery Process (EDP) and regional intermediary bodies will implement or fully benefit from the Strategy.

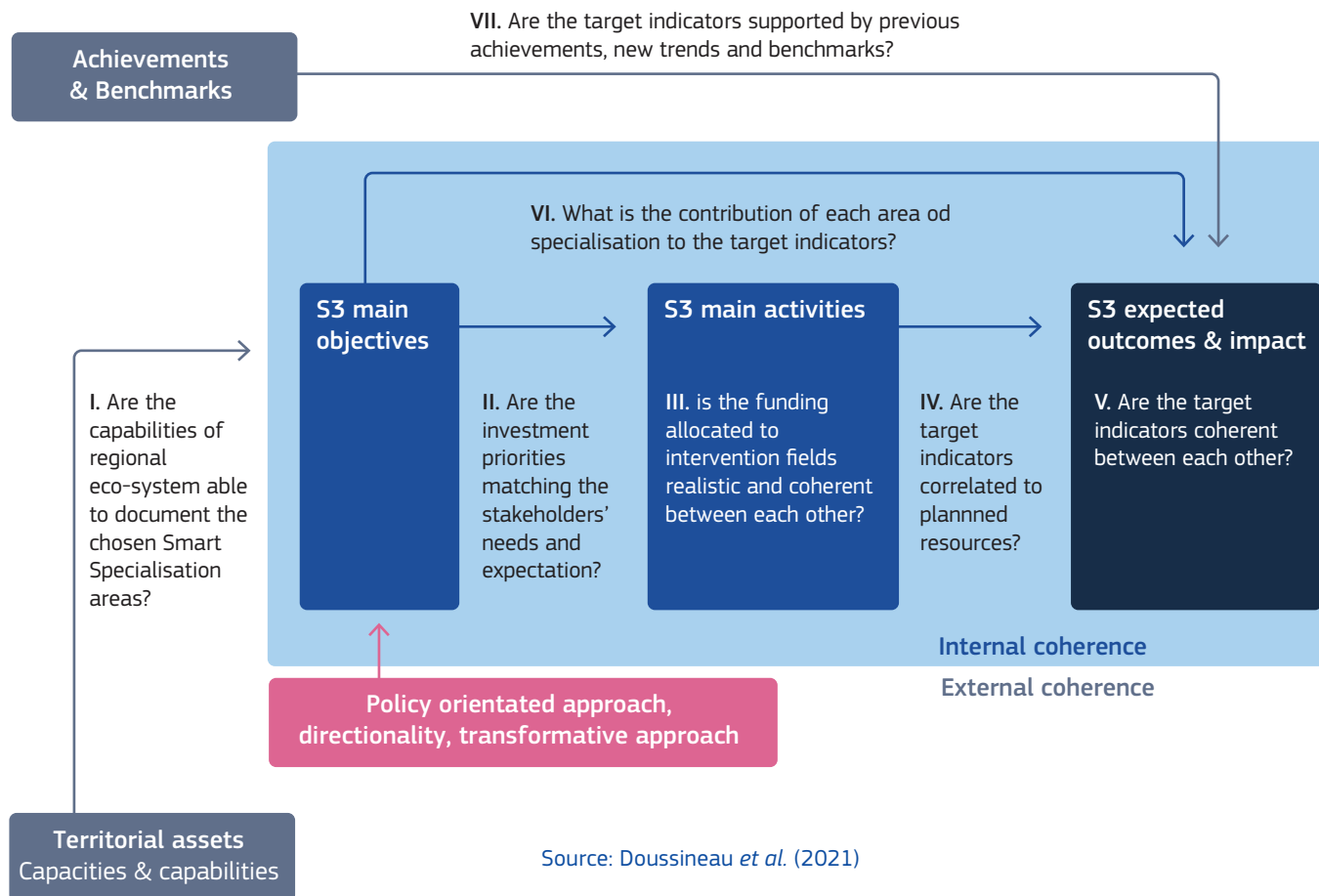
Any public policy intervention is designed through vari-

ous actions such as assigning a budget, deciding on priorities, funding sources, and support measures. In public policy evaluation theory, the coherence of a public intervention involves looking at how well or not different actions work together. It may highlight components where synergies improve the overall performance or, conversely, point out tensions between objectives and associated activities, which are potentially incoherent or inefficient. One can then further differentiate between the internal and external coherence of the logic of intervention. Assessing “internal” coherence requires considering how the various components of the same intervention operate together to achieve its objectives. Coherence is also necessary for other “external” components such as previous achievements or international benchmarking, or between interventions within the same policy area. The following questions should be addressed to appreciate the strengths of the intervention logic:

1. Are the chosen Smart Specialisation areas related to the existing capabilities of the regional ecosystem (external coherence)?
2. Do the investment priorities match stakeholders’ needs and expectations (relevance)?
3. Is the funding allocated to intervention fields realistic and coherent between each other (internal coherence)?
4. Are the target indicators coherent with the planned resources (internal coherence)?
5. Are the target indicators coherent between each other (internal coherence)?
6. What is the contribution of each area of specialisation to the target indicators (impact)?
7. Are the target indicators supported by previous achievements, new trends, and benchmarking (external coherence)?

As shown in the figure below, all decisions taken to design the Strategy and its implementation modalities should be well documented and coherent with other choices. The operational capacity of smart specialisation requires human resources, management accountability skills and implementation budget. The administration should be able to respond to questions such as “Are the necessary human resources available?”, “Are the implementation costs suitably taken into consideration?”, “Who will be accountable for the management and implementation of the different parts of the strategy?” The department responsible for implementing the

strategy must have the capabilities and skills needed. The regional administration must identify who will lead the implementation process and correctly quantify the implementation costs. The operationalisation of smart specialisation strategies must be performed across departments, avoiding the JIMA (“Just In My Administration” silo syndrome). The governance matrix must include an overview of the management activities, budget and accountability activities, implementation bodies and the accountability of the key stakeholders. The administration must realistically forecast the implementation costs.



Source: Doussineau *et al.* (2021)

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Supporting firm growth

PURPOSE Building knowledge and a sustainable capacity base to navigate transitions

USE Strengthening human capital to be equipped in advanced working environments

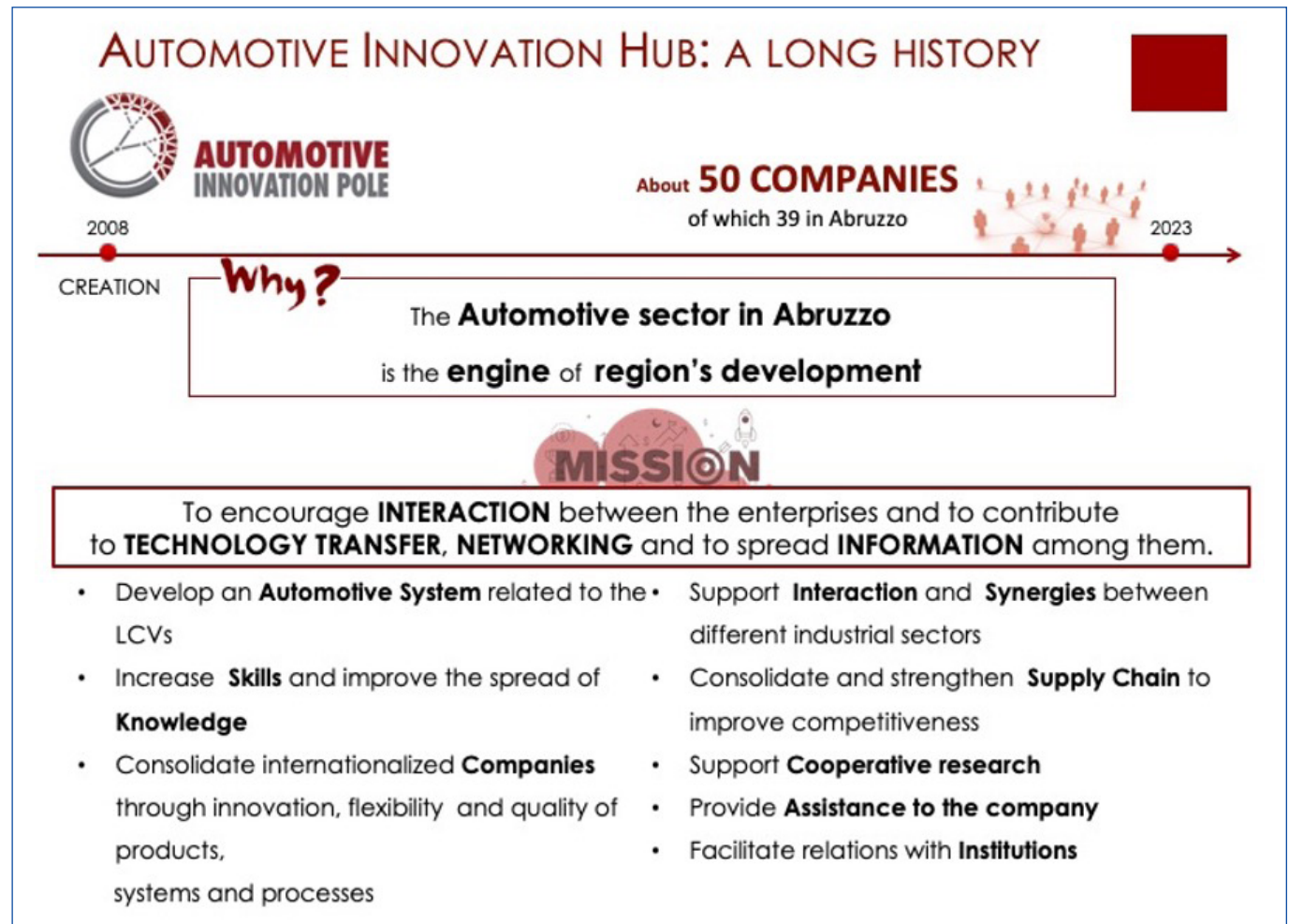
ACTIONBOOK ACTIVITIES
Mobilising resources
Designing ecosystem support
Deploying a strategy

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MORE
→ [Policy brief: Clusters. Driving the green and digital twin transitions](#)
→ [Abruzzo, a dynamic automotive ecosystem](#)

In designing the future of the automotive sector, regional governments may prioritise the ambition to incentivise and support regional firms to invest in skills in order to improve their management innovation and transformative capability, especially in response to major green transition in the automotive sector. Looking at the case of Abruzzo region in Italy, a new technical body was introduced by the regional government to strengthen the governance system and address challenges in the delivery of the Smart Specialisation Strategy. This

included the exploration of possible synergies between the different domains of specialization, such as within the context of the 'green-digital twin'. In its endeavour to support firms in the region, Abruzzo also focused on enhancing the cooperation between stakeholders of similar ecosystems. This action focused on identifying similar challenges, such as exchange of staff, collaboration either between firms and R&D centres or only between firms, and collaboration in and between supply/value chain.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Sustainable development as a transition

PURPOSE Embracing socio-technical systems change

USE Thinking of transitions as complex multilevel processes

ACTIONBOOK ACTIVITIES

- Identifying stakeholders for given societal goals
- Diagnosing and developing a vision
- Developing transition pathways and roadmaps
- Scaling and mainstreaming

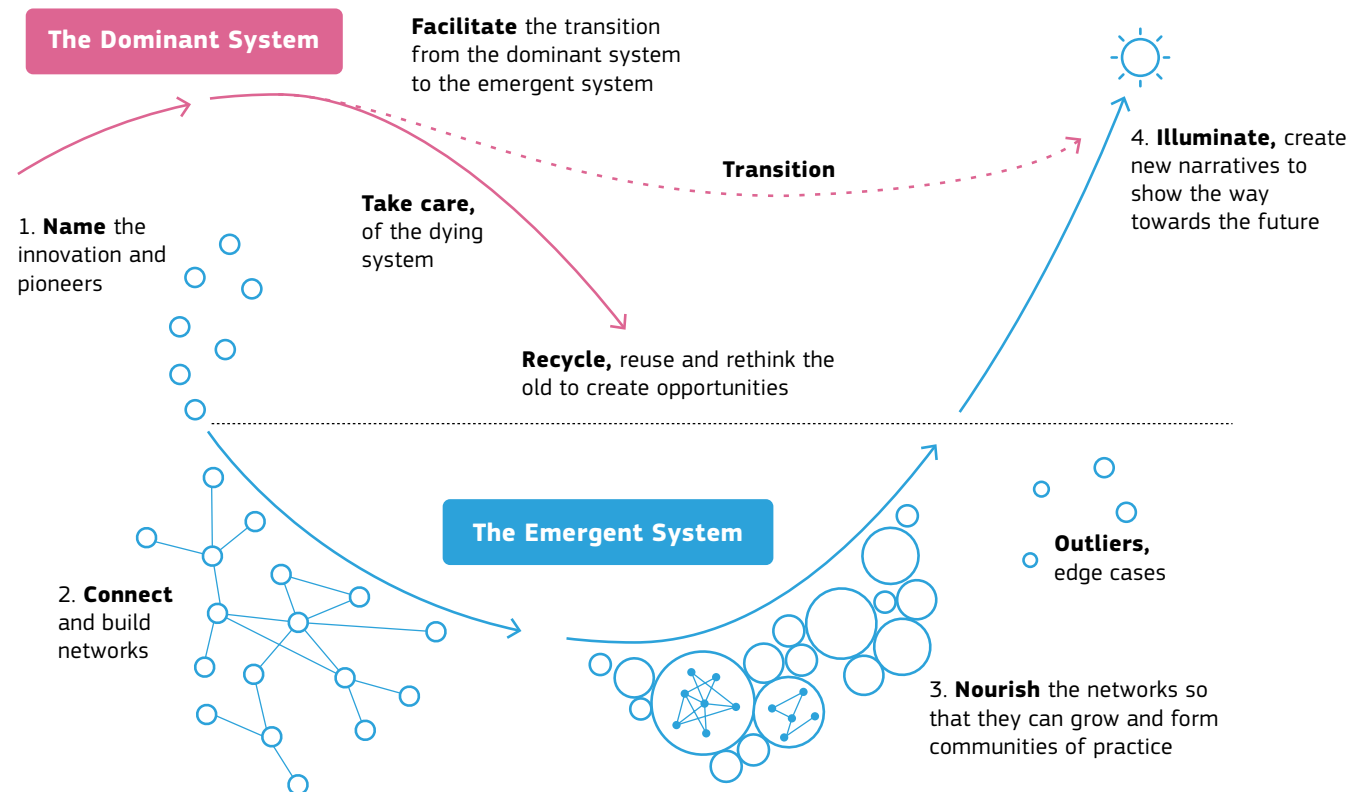
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MORE

- [Two loops model](#)
- [Pioneering a new paradigm](#)

Dominant socio-technical systems are characterised by individuals, norms, institutions, infrastructures and technologies, which are intertwined and reinforce each other. This leads to lock-ins, path dependency and resistance to change in current systems. Technological green fixes can hide the urgent need for transitioning from current business models to socio-technical systems in line to achieve the SDGs. To this aim, transformations (or transitions) that are more ambitious are needed. For example, new socio-technical systems should enable citizens to engage and contribute to the SDGs beyond their buying choices. A socio-technical system transition involves social, behavioural and technological change in an interrelated way, so that the end

result is change in all elements of the old production and consumption configurations. Can you think about socio-technical systems that require urgent transitioning for sustainability? [hint: energy, mobility, food, water, healthcare and communication]. The two loops model highlights transitions as a non-linear process, without predefined steps for change. It describes two systems: the dominant system, with its growth and subsequent decline; and an emerging system formed by alternative niches arising in the landscape. Given the coexistence of the two systems, when designing and implementing policies, we need to ensure a fair transition from the old system, but also support the emergence and viability of alternatives that can contribute to the SDGs.



Two loops model. Source: adapted from Berkana Institute

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Technological infrastructures for energy transition

PURPOSE Co-developing technological infrastructures in support of energy transition

USE Initiating a process that identifies and co-creates suitable technological infrastructures

ACTIONBOOK ACTIVITIES **Designing local missions**
Deploying a strategy
Experimenting and demonstrating

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MORE → [Centro Ibérico de Investigación en Almacenamiento Energético](#)

Strategic research infrastructure investments on energy efficiency and renewables are powerful tools to reduce energy dependency, however their large investment requirements, their complex setting and mostly their maintenance costs, make these assets a challenging resource whose localisation can be controversial. However when territories cooperate and involve public and private groups as well as users, these projects entail systemic transformative potential. Key infrastructures are vital prerequisites for innovation activities, as they facilitate the organisation and diffusion of innovations. The

complexity for policy makers is to avoid “supply-side” competition, which can result in duplication of services, equipment and infrastructures. Hence the importance of finding complementarities between infrastructures. Public-Private cooperation offers an integral mode of conceiving these facilities by providing the organizational frame for enhancing complementarities, generating knowledge conducing to ‘producing’ innovations and bringing new products or processes to society. Collaboration could take place, among others, in the following phases of the infrastructure development.

Building blocks for Technological Infrastructures on Energy transition and diffusion of sustainability solutions

Co design	Green Public Procurement	New governance and public accountability	Open data Open science	Open innovation	Monitoring and Evaluation	Funding
A sound Open Discovery Process, allowing stakeholders engagement for identification of needs and challenges, definition of capacities, life cycle awareness, business model design.	All along the different phases of the facility development. GPP can be a driver for innovation, engaging multiple actors, providing industry with incentives for developing new solutions, environmental friendly works products and services.	Public private governance allowing for multilevel cooperation. Transparency and public accountability.	When researchers share knowledge and data as early as possible in the research process with all relevant actors it helps diffuse the latest knowledge.	User-centric environments characterised by early and continuous involvement of users and by user-driven rapid prototyping cycles. Establishing sustainable partnerships.	New measurements of performance, based on cooperation intensity and contribution to territorial wellbeing, connectiveness and fairness. Stakeholders and impact evaluation.	Multilevel and territorial cooperation allow synergies between private and private funds, always in compliance with State Aid regulations.

An example of energy infrastructure: Iberian Energy Storage Research Center – CIIAE

To be located in Extremadura (Spain), with a budget of €53m, CIIAE is an example of funding synergy between Recovery and Resilience Plans and ERDF, with the support of regional and national research centers, aiming at the full cycle of capacity building and implementation of technologies for the production, storage and distribution of green energy, covering the challenges related to

energy manageability. Technology diffusion is foreseen through collaboration between the public and private sector at national and international (Spain & Portugal) level. CIIAE covers competing energy storage solutions in the electricity sector, hydrogen, power-to-x, and thermal energy storage.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Territorial Economic Data viewer (TEDv)

PURPOSE Supporting policy monitoring

USE Comparing regional performance

ACTIONBOOK ACTIVITIES

- Building legitimacy
- Developing a strategy
- Developing the policy and action mix
- Prioritising funds

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MORE

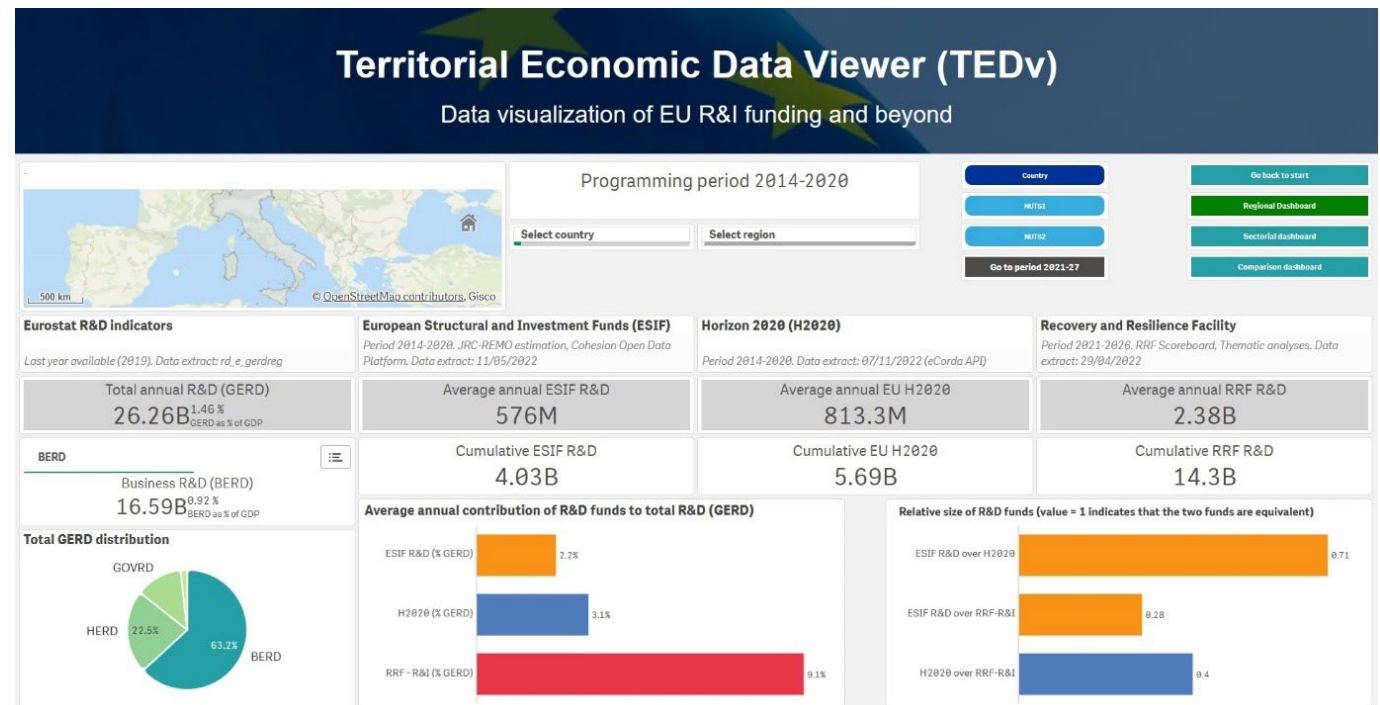
- [Territorial Economic Data viewer](#)
- [TEDv Working Paper_JRC133404](#)

The Territorial Economic Data viewer (TEDv) is a data visualization tool to monitor the use of different Research and Innovation (R&I) funding programs and the socio-economic regional performance.

- Users can compare the concentration of different EU funds in a particular territory and their contribution to the total Research and Development expenditure of a territory.
- TEDv displays the sectorial/thematic concentration of different R&I funding programs, showing the territorial

funding specialisation pattern.

- It allows comparing territories in terms of the allocation of different Research and Innovation funding programs. For instance, users can see how much competitive R&I funds (e.g. through H2020 of Horizon Europe) the region has managed to attract compared to regions with similar characteristics.
- Users can also compare the socio-economic performance of a region over time with the country and EU average.



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Universities and transformative innovation

PURPOSE Understanding how universities can contribute to systems change through innovation

USE Considering alternative pathways for change depending on the specific territorial context

ACTIONBOOK ACTIVITIES Collaborating across territories
Experimenting and demonstrating
Managing and transforming knowledge
Mobilising competences

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MORE → [Governance and systems innovation](#)
→ [Collaboration between universities](#)
→ [Innovation pathways](#)
→ [Tools from EU](#)
→ [Tools from US](#)

The table below identifies potential avenues for universities to reinforce their capacity to deliver on transformative innovation, both in the territory they are located and beyond. Depending on the local context, different pathways can be selected or combined. Pathways are

suggested in relation to education, research and business. However, overall, a more systemic governance and stakeholder engagement approach would be required for universities to better integrate societal transformation in universities' DNA.

Dimension	Pathways
Education	<ul style="list-style-type: none"> Widen the focus from research and start-ups to people as drivers of innovation, and build alliances across tertiary education (with polytechnics, universities of applied sciences, VET schools); Organise transformative education and programmes: mission-oriented teaching with student engagement in developing tomorrow's solutions, reinforcing transdisciplinary and transsectoral capacities for creating systemic change and understanding complexity; Upskilling and reskilling of those already at work (lifelong learning), rethinking vocational training.
Research	<ul style="list-style-type: none"> Multidisciplinarity for both agenda setting and development of solutions; Create opportunities for interaction and stakeholder engagement for a holistic view of territorial challenges.
Business	<ul style="list-style-type: none"> Importance of industrial doctorates as a bridge between firms and university; Mapping of required competences in the specific fields and alignment with skills offer; Strengthening the role of technology, e.g. high-tech platforms and technology centres for business support; digital innovation hubs; research, training and services related to digital, blockchain, AI.
Engagement	<ul style="list-style-type: none"> Widen stakeholder and citizen engagement in line with an Open Discovery Process; Join forces with other universities and connect them with local stakeholder; Engage with system actors representing value chains (such as (Euro)clusters, university contributions to Transition Pathways of European industrial ecosystems); Partner with public administrations; Optimise internal whole-of-governance (external engagement depends on good internal connectivity); Build trust for long-term place-based partnerships. If needed, introduce new, soft institutions like additional platforms, working groups or discussion circles.
Governance	<ul style="list-style-type: none"> Consider a more systemic and holistic approach to transformative innovation in universities: consider a closer integration between its three missions, promote whole-of government within universities, diversify incentive schemes and evaluation models; Public authorities can consider diversifying financing (ERDF, ESF, RRF,...) based on innovation performance, support strong territorial leadership in universities and public administrations, diversify collaboration instruments; Reinforce links with and support to regional or urban missions; Diversify the toolbox for systems change: regulatory sandboxes, new fiscal models and business models, agenda setting for future pathways, universities as lead users for new market creation.

Avenues for universities to deliver on transformative innovation.

Source: author's elaboration based on inputs from Trippel et al., 2023; Hazelkorn, E., Kroll, H., Cavicchi, A., and Morgan, K.

TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
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european

Waste management impacts: assessment of eco-innovative strategies

PURPOSE Informing decision-makers on the impacts of alternative strategies

USE Maximising benefits of waste management at local level

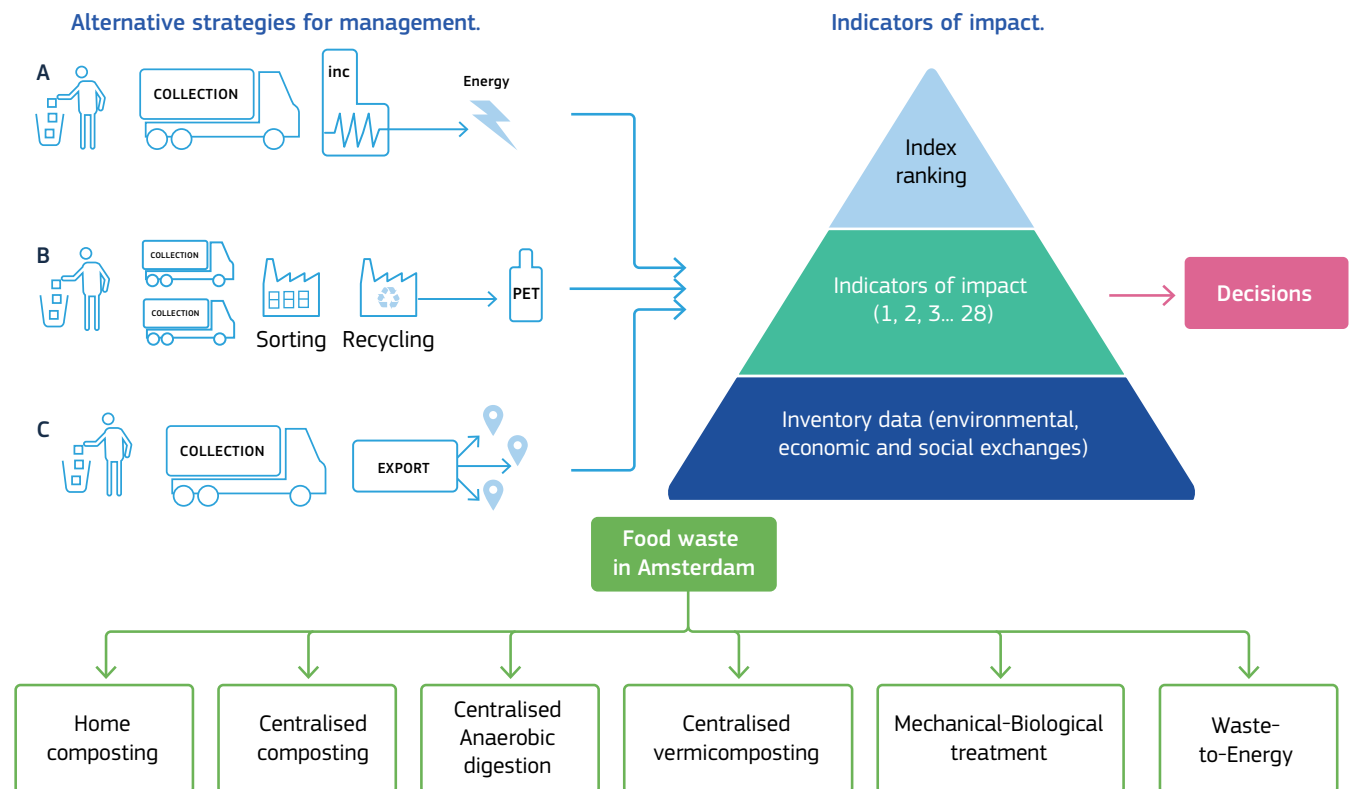
ACTIONBOOK ACTIVITIES Building legitimacy
Continuous monitoring
Evaluating impact

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MORE → [European Platform on LCA](#)
→ [Repair Amsterdam case study](#)
→ [GDSE tool description](#)
→ [New Circular Economy Business Model](#)

While a variety of solutions and technology for waste management exist, optimal eco-innovative management strategies of waste strongly depend upon regional factors such as recycling capacity installed, demand/markets for secondary resources, density and other characteristics or constraints of the region. In this context, sustainability assessment tools can be applied to inform decision-makers on the environmental, economic, and social impacts of eco-innovative waste management strategies. These tools are mainly quantitative, based on life cycle thinking and allow modelling local innovative strategies providing a quantification of the environmental, economic, and social impacts across sustainability dimensions (e.g. climate change, smog, total employment in the waste sector, capital and operational costs). The indicators should be decided by con-

sulting local stakeholders (authorities, citizens, industry, operators, NGOs, etc.) and experts. Additional techniques may then be used to aggregate the different indicators of impact in order to obtain a more easy-to-communicate ranking of the strategies studied or even a single-score final indicator. For example, the H2020 REPAiR project developed an operational framework to quantify the impacts of regional/municipal waste management strategies, and identify and rank the best ones using MCDA (Taelman et al., 2020). This was applied to various cities in the EU, to feed local circular economy strategies. The framework included life cycle (and material flow) analyses of waste management systems. There are also more specific and quick calculators, e.g. the tool developed by the JRC to estimate the impacts of pre-selected food waste prevention strategies.



TYPE

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LEVEL

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Waste management in a circular economy– innovation and regulation

PURPOSE Promoting the implementation of initiatives to reuse and recycle waste

USE Managing waste according to the EU waste hierarchy in ways that create multiple value

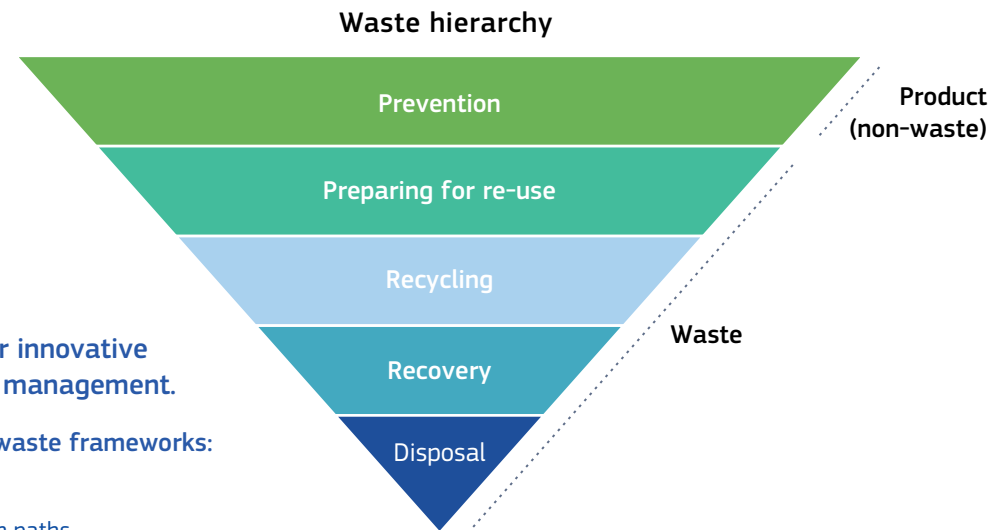
ACTIONBOOK ACTIVITIES
Building legitimacy
Collaborating across territories
Coordinating the policy and action mix

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MORE
→ [EU Waste legislation](#)
→ [The EU's circular action plan](#)

Waste management services provide collection, transportation, processing, recycling, and disposal of materials that have been discarded. The foundation of EU waste management is the “waste hierarchy”, launched in the Waste Framework Directive. It establishes an order of preference for managing and disposing waste. Waste prevention is the desired option in a circular economy, but waste generation is still growing because of increasing material use. Sound waste management helps protect human health, reduces environmental impacts, and alleviates import dependency of primary resources from other states. Management options are strongly constrained by local conditions like for example urban density, geography, or climate, and hence mostly organised at municipal level. Technologies may vary in their performance, therefore technical guidance and measures that form part of EU and national legislation are essential. To increase flexibility and account for regional and local specificities, waste legislation at EU level

often involves performance-oriented requirements that are technology neutral and promote innovation by increasing the attractiveness of engaging in R&D and avoiding lock-in into suboptimal standards. Examples of such legislation include preparing for re-using and recycling targets for certain waste streams (e.g. paper, metal, plastic waste, or end-of-life vehicles), the ban of pollution-causing practices without prescribing fixed alternatives (e.g. the phasing out of landfilling biodegradable waste), or minimum quality standards to ensure that recycled waste can be placed on the internal market as a standardised product. Ex-ante impact assessments that compare policy options as well as stakeholder inputs ensure that tangible social, economic and environmental benefits are generated by new EU legislation. The regulatory EU framework on waste aims to foster new opportunities for private companies, national authorities and citizens throughout the EU to turn waste into a valuable resource.



Five elements to consider for innovative regulation on circular waste management.

Innovation-friendly regulation waste frameworks:

- Bear in mind the waste hierarchy
- Consider different implementation paths
- Minimise prescriptive actions
- Contemplate the local context
- Build on stakeholder inputs

Whole-of-government approach: options to implement it

PURPOSE Defining options for putting in place a whole-of-government approach

USE Improving collaboration and coordination among government departments and governance levels

ACTIONBOOK ACTIVITIES Enabling multilevel cooperation
Collaborating across departments

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MORE → [Investments across governance levels](#)
→ [Governance of Innovation Systems, Vol. 1: Synthesis Report - OECD](#)
→ [The Future of Regional Development and Public Investment in Wales, United Kingdom \(gov.wales\)](#)

Implementing a whole-of-government (WoG) approach can be a complex exercise that requires a careful balancing act between existing features of the governance system and new features aimed at improving collabora-

tion, coordination and effectiveness across government departments and agencies. Based on earlier experiences with WoG, the following principles could guide the implementation.

General purpose	Options
Identification of all relevant policies, departments and agencies in your territory	<ul style="list-style-type: none"> Using systems mapping approaches to better understand the role of different policies; Using power maps to better understand the potential role of different policies and the division of responsibilities in different departments, managing authorities and agencies in the territory as well as at lower and higher governance levels; Reviewing the identification over time with an evolving transformation agenda;
Increasing the problem awareness and ownership among decision-makers, as well as the capacity to act upon it	<ul style="list-style-type: none"> Using digital visualisations on the potential impact of climate change in the territory, organising (temporary) staff exchanges between departments; Calculating future impact on each sector and the related cost of inaction; Analysing necessary capacities and seek internal and external support for training needs; Setting up joint stakeholder consultations between departments; Applying horizon scanning and other foresight approaches involving relevant departments; Developing strong political leadership; Creating small wins to build trust; Procuring early involvement of all departments to increase ownership; Assessing obstacles to cooperation and the identification of possible solutions; Considering a variety of policy tools (including new business models, living labs, demonstrators,...) and using the whole territory as a living lab;
Setting up a tailored governance structure for implementing the transformation agenda	<ul style="list-style-type: none"> Setting up tailored governance structures, e.g. interdepartmental working group(s), possibly with rotating presidency to increase ownership, or involving a coordinating department (e.g. the president's office), developing guidelines on decision-making and attendance; Involving a third party (e.g. a subcontractor) for collecting data, making proposals and mediating joint solutions. Considering the cost of not coordinating and diversifying between more and less relevant departments (e.g. a core group and a wider group); Organising stakeholder engagements across policies and set up relevant governance structures for a shared stakeholder governance; Finding the right balance between top-down and bottom-up steering; Connecting planning, implementation, monitoring and evaluation;
Organise involvement of lower and higher governance levels	<ul style="list-style-type: none"> Negotiating involvement in policy design and implementation at higher governance level, possibly through collaboration with other territories to increase impact; Communicating impacts of higher level policies and funding programmes on lower levels (planning level versus solutions level); Creating a sharing and learning culture for co-design; offering guidance, support and expertise and platforms for collaboration to lower level territories where needed;

TYPE

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LEVEL

local
regional
national
european

Whole-of-government approach: power maps

PURPOSE Identifying relevant actors towards a whole-of-government approach

USE Setting the ground for customised governance

ACTIONBOOK ACTIVITIES Agenda setting and sharing
Enabling multilevel cooperation
Collaborating across departments

AUTHORS Karel Herman Haegeman
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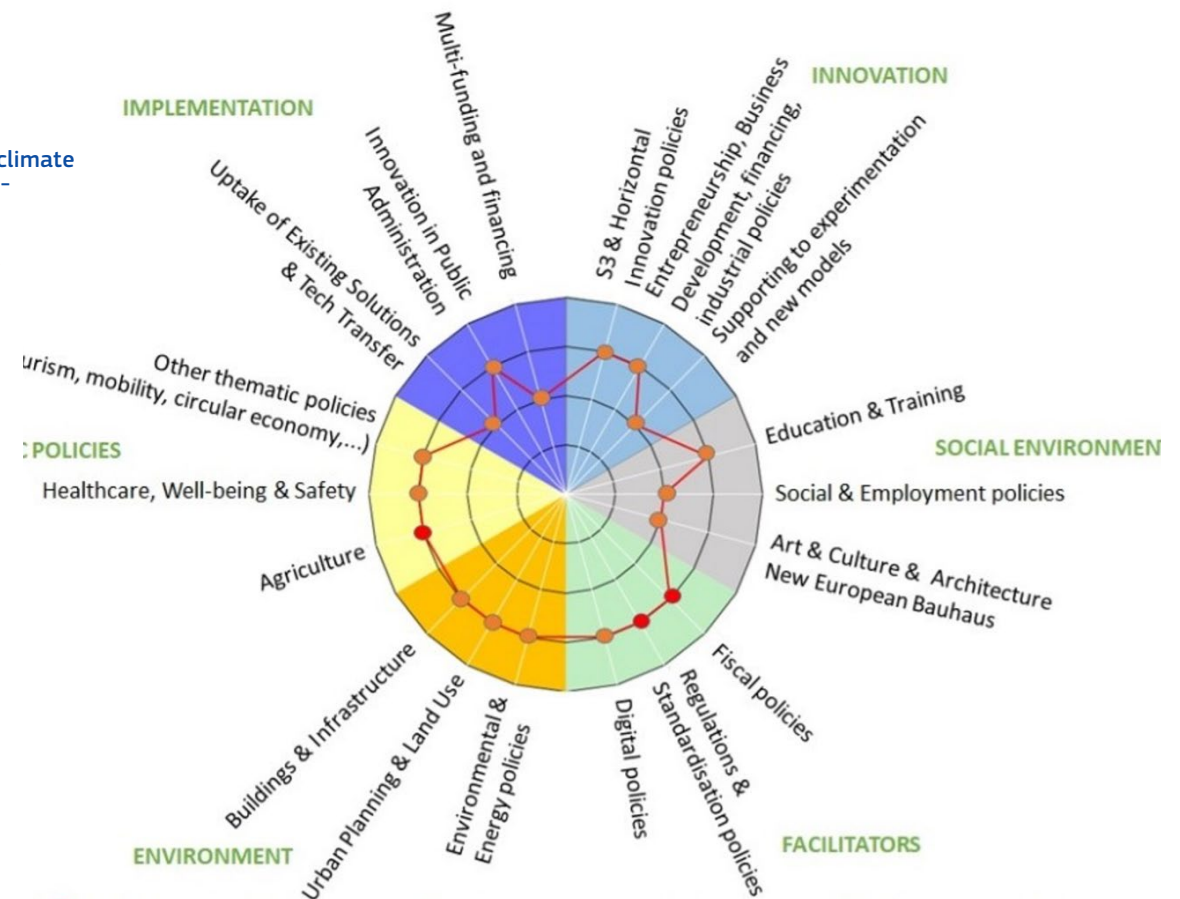
MORE → Governance of innovation pathways for climate resilience (Forthcoming)
→ [Coordination challenges in interterritorial cooperation](#)

Setting up tailored whole-of-government structures, that can adequately develop and implement a territorial transformation agenda, requires a good understanding of the relevant policies, of their potential concrete contribution to shaping and implementing the agenda, as well as where the responsibilities are located (inside or outside the territory, at what level, and whether it is a shared responsibility). Additionally, understanding the relative importance of each policy allows to prioritise the most relevant one (and therefore optimise the cost of coordination) and develop more optimal governance solutions. By using a quantification of the relevance and degree of ownership (green – orange - red) of each policy for a given territory, powers maps can be designed for a given territorial transformation agenda. Power

maps illustrates the horizontal and vertical governance challenges related to the transformation envisaged. The chart illustrates the governance coordination challenges for the climate adaptation agenda of Gorenjska region, where, for no single policy measure, the region has full responsibility, requiring a multilevel governance approach in all policy areas. Power maps can complement or be combined with systems mapping. They can also be developed for different governance levels in the same territory, as a basis for optimising collaboration and developing a well-functioning governance model. It may also support interterritorial collaboration, e.g. as territories may look for collaboration with similar counterparts in terms of relevant policy areas and degree of ownership.

Power map for the climate adaptation agenda - Gorenjska region.

Full responsibility
Partial responsibility
No responsibility



TYPE

concept
methodology
eu policy initiative
example

LEVEL

local
regional
national
european

Working backwards to create multiple value: the case of NutriAlth3D

PURPOSE Developing innovation to solve local problems collaboratively

USE Linking local strengths with the global opportunities for policy and projects

ACTIONBOOK ACTIVITIES Identifying stakeholders for given societal goals
Continuously engaging with stakeholders
Diagnosing and developing a vision
Agenda setting and sharing

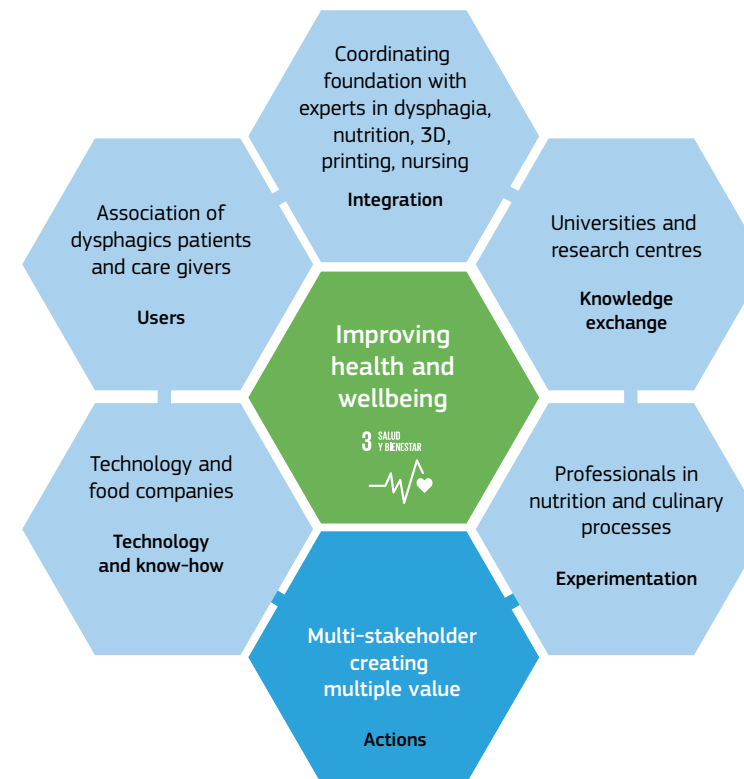
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MORE → [NutriAlth3D](#)

Over a population of 46.8 million people, in Spain two million people are affected by the inability to swallow food or drinks (oropharyngeal dysphagia). People suffering from this swallowing disorder eat mashed food, which causes them to lose interest in eating and can lead them to dehydration and malnutrition. This affects also their health and social life and that of their families, as they may feel uncomfortable eating in public. Yet, early detection and multidisciplinary intervention

can help them achieve a healthier life. For this, stakeholders from various sectors and fields joined forces to tackle this problem and find a multidisciplinary solution to create social and economic value (see T07 Challenge-oriented innovation).

With this goal in mind, stakeholders adapted existing technology to deliver 3D printing food that is easier to swallow, while maintaining quality and taste.



Multi-stakeholder collaboration to achieve common goal and create multiple value.

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