SCALINGS

CO — CREATING EUROPEAN FUTURES

INNOVATION
PARTICIPATION
CO—CREATION

EUROPE
2030

CONTENTS

Co-creation is a new approach to improving innovation processes and their outcomes. The term "co-creation" broadly denotes the collaboration of diverse actors, such as companies, universities, policymakers and members of the public, in innovation processes. Co-creation is often understood as a way of sparking new ideas for innovation processes and making innovations more user-friendly and hence more successful in the market. However, at the same time, co-creation is also heralded as an opportunity for making innovation processes more socially inclusive and responsible because it allows innovators to integrate diverse actors into the innovation process. It is the latter perspective that we foreground in this roadmap, as it resonates with hopes expressed in many European innovation policy documents.

The purpose of this roadmap is to guide co-creation actors towards designing and implementing socially inclusive and responsible co-creation activities. To this end, we consider co-creation in the context of some of the key challenges Europe is facing today, such as growing social inequality and questions of how to ensure the equal participation of diverse members of the public in key social and political processes in European societies. We start from the assumption that social and technological innovation activities are such key processes: Innovations shape our lives on an everyday basis. Depending on how they are designed and implemented, they can create opportunities for some and challenges for others. It is therefore important to include a diverse range of perspectives in innovation activities to avoid unjust biases and an unequal distribution of risks and benefits. In this roadmap, we provide guidance on how to design and implement co-creation activities in socially inclusive and responsible ways.

For the design of this roadmap, we draw on empirical material from the EU Horizon 2020 project "Scaling up Co-creation: Avenues and Limits for Integrating Society in Science and Innovation (SCALINGS)". Over the course of three years (2018-2021), SCALINGS investigated the implementation, uptake and outcomes of co-creation activities across Europe. The project included studies of three different co-creation instruments (public procurement of innovation, co-creation facilities and living labs) in three technological domains (robotics, urban energy and autonomous driving) across eleven European countries: Austria, Belgium, Denmark, France, Germany, Italy, Poland, Spain, Switzerland, The Netherlands and the United Kingdom.
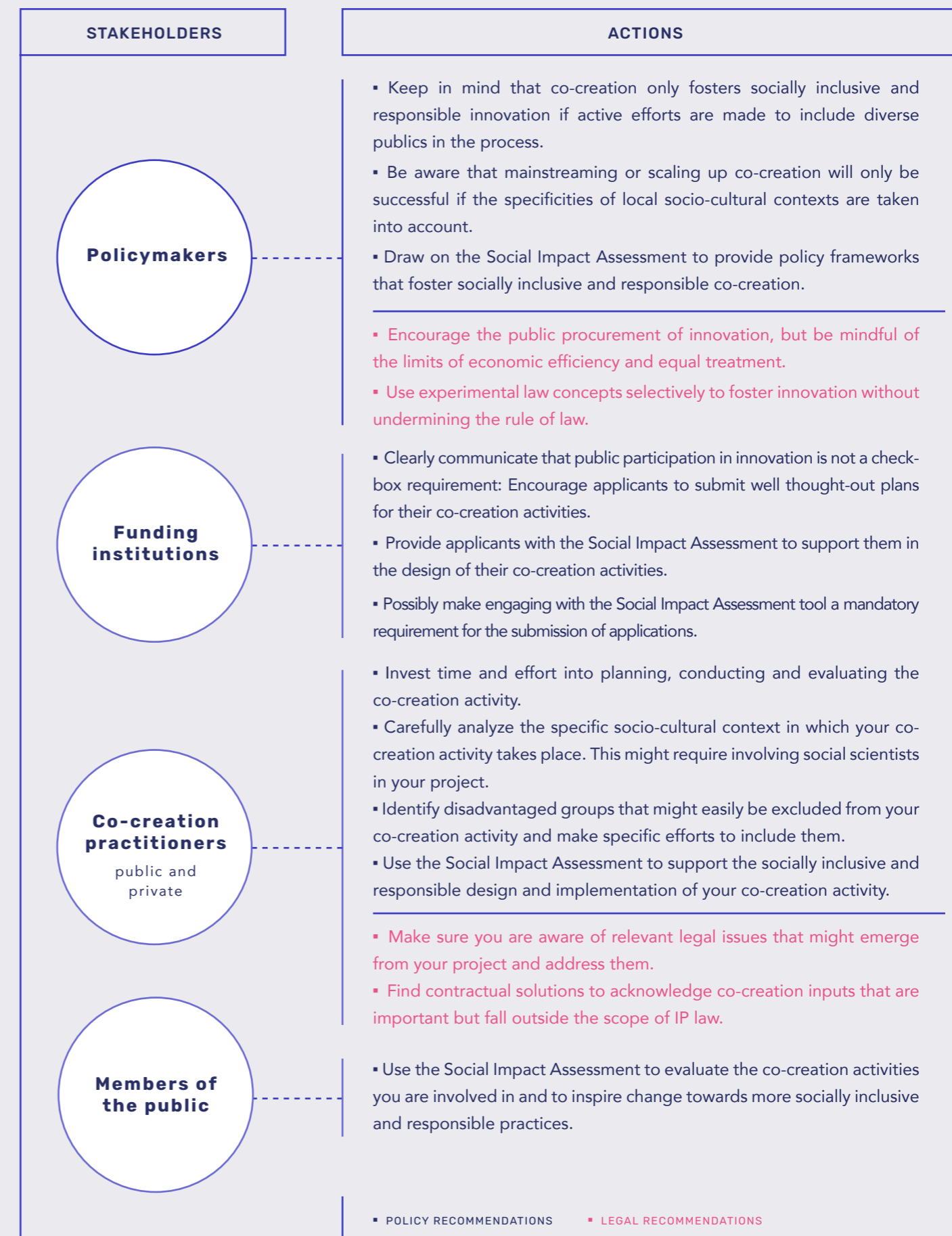
Based on this in-depth empirical research, we analyzed the strengths, weaknesses, opportunities of and threats to co-creation as a novel form of innovation in Europe (SWOT analysis). Focusing on questions of social justice, equity and inclusion, our research has shown that policy issues regarding co-creation cluster around five thematic areas: recruitment of participants, distribution of decision-making power, technological vs. social innovation, co-creation as a funding requirement and the possibility of scaling-up co-creation across different sites.

Building on our SWOT analysis, we developed a "Social Impact Assessment for Socially Inclusive and Responsible Co-Creation" to help orient co-creation actors towards more responsible, socially just and inclusive forms of innovation. This assessment tool provides a set of

key questions that co-creation actors can use to provide policy frameworks for socially inclusive and responsible co-creation (policymakers), to support and evaluate applicants in the design of co-creation activities (funders), to guide the design and implementation of co-creation activities (practitioners) and to evaluate their own participation in innovation processes (members of the public). The Social Impact Assessment tool addresses vital issues to ensure the socially inclusive and responsible design of co-creation activities, such as recruitment, engagement methods, agency, benefits, risks, outcomes and scaling-up. We hope that this tool will be taken up by different stakeholders to help to realize the potential of co-creation for more socially inclusive and responsible innovation activities across Europe.

In this roadmap, we further identified key legal challenges for co-creation. These challenges pertain particularly to the domains of public procurement law, intellectual property law and experimental law. Where the law complicates co-creation or conflicts with it, we have formulated concrete recommendations for different stakeholders in co-creation processes in Europe.

Bringing together our policy and legal analysis, we arrive at a set of key recommendations for policymakers, funders, co-creation practitioners and members of the public in Europe:

STAKEHOLDERS	ACTIONS
Policymakers	▪ Keep in mind that co-creation only fosters socially inclusive and responsible innovation if active efforts are made to include diverse publics in the process. ▪ Be aware that mainstreaming or scaling up co-creation will only be successful if the specificities of local socio-cultural contexts are taken into account. ▪ Draw on the Social Impact Assessment to provide policy frameworks that foster socially inclusive and responsible co-creation. ▪ Encourage the public procurement of innovation, but be mindful of the limits of economic efficiency and equal treatment. ▪ Use experimental law concepts selectively to foster innovation without undermining the rule of law.
Funding institutions	▪ Clearly communicate that public participation in innovation is not a check-box requirement: Encourage applicants to submit well thought-out plans for their co-creation activities. ▪ Provide applicants with the Social Impact Assessment to support them in the design of their co-creation activities. ▪ Possibly make engaging with the Social Impact Assessment tool a mandatory requirement for the submission of applications.
Co-creation practitioners public and private	▪ Invest time and effort into planning, conducting and evaluating the co-creation activity. ▪ Carefully analyze the specific socio-cultural context in which your co-creation activity takes place. This might require involving social scientists in your project. ▪ Identify disadvantaged groups that might easily be excluded from your co-creation activity and make specific efforts to include them. ▪ Use the Social Impact Assessment to support the socially inclusive and responsible design and implementation of your co-creation activity. ▪ Make sure you are aware of relevant legal issues that might emerge from your project and address them. ▪ Find contractual solutions to acknowledge co-creation inputs that are important but fall outside the scope of IP law.
Members of the public	▪ Use the Social Impact Assessment to evaluate the co-creation activities you are involved in and to inspire change towards more socially inclusive and responsible practices.

▪ POLICY RECOMMENDATIONS   ▪ LEGAL RECOMMENDATIONS

For more information on SCALINGS, please visit:
www.scalings.eu or www.scalings.eu/roadmap

THE SCALINGS PROJECT

RESEARCHING CO-CREATION IN EUROPE

This roadmap is based on the EU Horizon 2020 project, "Scaling up Co-creation: Avenues and Limits for Integrating Society in Science an Innovation", or "SCALINGS" for short. SCALINGS is based on the assumption that co-creation practices – and co-creation research – are at a crossroads: More than ever, initiatives to boost innovation through collaboration among diverse actors are flourishing across Europe. Yet, this mainstreaming poses new challenges to better understanding "co-creation processes and outcomes under various cultural, societal and regulatory backgrounds to allow better-targeted policy support" (SwafS-13-17). Pertinent questions include:

What is co-creative innovation in theory and what is it in practice?

How can co-creation be practiced in a socially responsible and inclusive way in different European contexts?

What can policymakers do to promote and scale-up co-creation in Europe responsibly?

Over the course of three years (2018-2021), SCALINGS addressed these questions in different European settings. In the first ever rigorous comparative study, the SCALINGS team investigated the implementation, uptake and outcomes of three co-creation instruments (public procurement of innovation, co-creation facilities and living labs) in three technological domains (robotics, urban energy and autonomous driving) across eleven countries. Using comparative case studies and coordinated cross-country experiments, the project members explored if and how these instruments can be generalized, transferred or scaled up to other socio-cultural, economic or institutional conditions.

To support ongoing EU innovation policy efforts and to highlight the specific opportunities and challenges for socially responsible and just co-creation practices, we have synthesized our findings into the SCALINGS Policy Roadmap "Co-creating European Futures: Innovation, Participation and Co-creation in Europe 2030".

When diverse actors such as companies, universities, policymakers and members of the public collaborate in mutually enabled or supported innovation processes, they engage in co-creation practices. Co-creation takes many shapes, which is why SCALINGS employed different disciplinary angles to better identify and understand its characteristics and outcomes. To build its analytical framework, the project drew on critical perspectives stemming from Science and Technology Studies (STS).

STS is an interdisciplinary research field that focuses on the relationship between science, technology and society. STS scholars study the means, conditions and processes under which scientific knowledge as well as technological and social innovations are produced, including the specific contexts (e.g. social, political, economic and historical) of research and innovation. For instance, STS explores how innovations such as self-driving cars create new social and political opportunities and challenges for society, examines whose needs and perspectives are included or excluded in the development of these innovations and how both of these issues might vary across different local, national and cultural contexts.

This STS approach to co-creation is complemented by insights from other disciplines such as Innovation Studies, Public Policy and Law, Management and Economics as well as Philosophy and Ethics.

> To capture the diverse realities of co-creative innovation practices, SCALINGS studied the implementation, uptake and outcomes of co-creation using a series of comparative case studies. SCALINGS has accompanied more than 20 projects as they engage in different kinds of co-creative innovation practices in different technological domains and European countries.

CO-CREATION INSTRUMENTS

SCALINGS studied three co-creation instruments:

LIVING LABS

Living Labs promise to overcome the confines of traditional innovation settings by piloting – or "testing" – novel technologies under "real-world conditions". For example, a city district might be declared a living lab for self-driving vehicles, where these new transportation devices come to interact with other traffic participants. Often, living labs invite members of the public to actively provide feedback for and contribute to the innovation process.

PUBLIC PROCUREMENT OF INNOVATION

Public Procurement of Innovation procedures utilize the public sector's purchasing power to adopt innovative solutions that address public needs. Public end users become co-creators by identifying collective needs and collaborating with solution providers. For example, a city government might partner with robotics researchers and companies to develop technologies for sewer inspection that aim to reduce labor risks, improve precision of inspections or optimize the city's sewer cleaning resources.

CO-CREATION FACILITIES

Co-creation Facilities are physical or virtual spaces that a range of different actors can use to engage in shared innovation activities. For example, universities might provide laboratory space or testing environments as well as expertise to enable external users (e.g. industry partners, start-ups, members of the public) to engage in co-creation activities.

TECHNOLOGICAL DOMAINS

SCALINGS studied these co-creation instruments in three technological domains:

ROBOTICS

Robotics is increasingly finding its way into our everyday lives. Collaborative robots ("co-bots") are designed to work closely together with and for humans in a variety of application areas, ranging from education to healthcare to manufacturing. However, their use in social settings is often accompanied by multiple concerns. How can they operate safely in delicate environments such as hospitals or schools? How can we protect them from being hacked or manipulated? Answering these questions greatly depends on co-creation efforts among co-bot developers, operators, end users and affected members of the public.
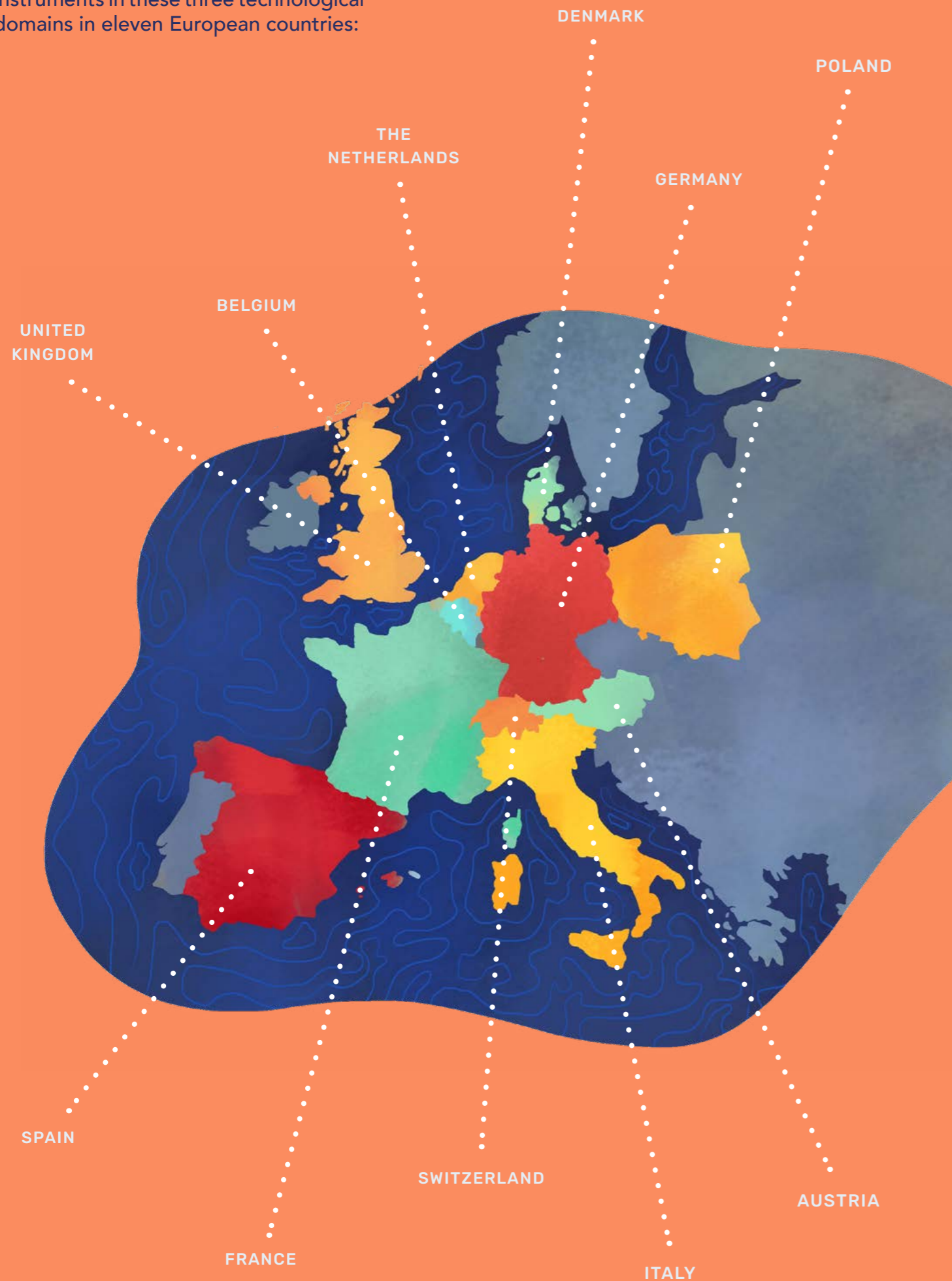
URBAN ENERGY

Urban Energy concepts are implemented to increase the sustainability of energy production and consumption. For example, families install photovoltaic systems on their roofs, home owners introduce smart metering systems to their buildings and communities invest in small local energy production. However, these transformations raise a number of questions. Who is able to participate in these new energy systems? How should these new energy systems be monitored and governed? How do different socio-technological scenarios tie into the sustainable energy transition? How can personal data be protected in increasingly digitalized energy infrastructures? Co-creation activities can help to shape energy transitions in more socially inclusive and responsible ways.

AUTONOMOUS DRIVING

Autonomous Driving is central to smart city discourses. Regardless of the potential benefits, the transition to new modes of transport often raises complex ethical, social and legal questions. Who is accountable in case of an accident? Who has access to this form of transport and when? Who is affected by large-scale infrastructure changes to make roads suitable for autonomous vehicles? Engaging in co-creation practices enables municipalities to consider these questions together with researchers, manufacturers and members of the public.

SCALINGS studied these co-creation instruments in these three technological domains in eleven European countries:

DENMARK

POLAND

THE NETHERLANDS

GERMANY

BELGIUM

UNITED KINGDOM

SPAIN

SWITZERLAND

AUSTRIA

FRANCE

ITALY

BEYOND COPY & PASTE:

TOWARDS A MAP OF MULTIPLE ROADS

As part of SCALINGS, we have conducted research about co-creative innovation practices across countries, instruments and technological domains, with the explicit aim to create a policy roadmap for co-creation in Europe. In this roadmap, we consider co-creation in the context of some of the key challenges Europe is facing today, such as growing social inequality and questions of how to ensure the social and political participation of members of the public regardless of their socio-economic position. We thus ask: how can co-creation help to address these challenges by increasing public participation in the development of social and technological innovations for the future of European society? And how can co-creation help to ensure that the benefits of new social and technological innovations serve Europeans equally, no matter their age, ethnicity, socio-economic status, dis/ability, gender or sexual orientation?

To answer these questions, we have drawn on the diversity of case studies that the SCALINGS project offered. These case studies showed how differently co-creation can look when it follows different goals and approaches and involves different stakeholders. Some of these co-creation practices realized the promise of increasing public participation in the development of social and technological innovations - others not so much. We analyzed these case studies in their specific situated contexts and defined dimensions that seemed essential for their success or failure. We operationalized these dimensions through a SWOT analysis that identified important strengths, weaknesses and opportunities of, as well as threats to, the co-creation approach to innovation. Based on this analysis, we arrived at a crucial insight: The specific social context is decisive for how a co-creation activity must be designed in order to achieve successful and diverse participation in innovation activities. This insight was essential to how we designed this roadmap. Instead of prescribing what co-creation must look like in order to achieve successful and diverse participation in innovation activities, we offer a set of criteria formulated as assessment questions that empower co-creation actors to design co-creation activities that will work in their specific context. These criteria are the basis of the Social Impact Assessment that is the core of this policy roadmap.

We complement the Social Impact Assessment with an explorative analysis of key legal aspects that practitioners of co-creation must consider. Co-creation challenges existing legal frameworks in multiple ways by inviting the public into innovation activities that usually happen behind closed doors. Our legal experts have identified three domains of the law that are of particular importance: public procurement law, intellectual property law and experimental law. Where the law complicates co-creation or even conflicts with it, we have formulated concrete recommendations to different stakeholders in the EU.

The SCALINGS roadmap emerged from an intensive iterative process, including continuous dialogue with the SCALINGS researchers and case study partners, as well as multiple feedback loops within the SCALINGS consortium. The last feedback loop opened up the conversation beyond the consortium by including input from a multinational expert panel and a diverse general audience of researchers, practitioners and policymakers.

Co-creation activities are not only able to provide new ideas for innovation, they can also enable meaningful public participation in innovation processes. If these forms of participation are intended to further social inclusion and reflect the diversity of contemporary European societies, it is essential to closely monitor who participates in co-creation activities.

Why is it an important goal to create socially inclusive innovations?

Social and technological innovations shape our lives on an everyday basis. For example, transport infrastructures in urban and rural areas significantly shape who can participate how in social life. If transport infrastructures are highly individualized, for example if they are largely based on individually owned cars, this excludes members of the public who cannot afford to own a car from a range of activities. Particularly if we are designing new technological innovations, for example new transport infrastructures, it is thus important to include a range of voices from the public to avoid introducing unjust biases. Co-creation activities can serve this goal if they are designed to encourage the participation of diverse members of the public. In this roadmap, we want to provide guidance on how to achieve this goal.

CO-CREATION:

STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS

Co-creation practices can take many shapes. Hence, there are examples of co-creation which indeed pave the way for more inclusive forms of innovation, while in other cases, co-creation might have just the opposite effect.
The reasons for such disparities are not always obvious and not always intentional.

Based on our empirical research, we have systematized the various potential effects of co-creation in a SWOT matrix, including strategies for the future of co-creation in Europe. The SWOT analysis served as the basis for the Social Impact Assessment we propose as a targeted, flexible and situated set of guidelines for achieving more responsible and inclusive co-creation.

While we have utilized the traditional, often business-oriented tool of a SWOT analysis in terms of format, the content of our analysis focuses on questions of social justice, equity and inclusion. Our research has shown that policy issues regarding co-creation cluster specifically around five thematic areas:

1. RECRUITMENT
2. DECISION-MAKING POWER
3. TECHNOLOGICAL VS. SOCIAL INNOVATION
4. CO-CREATION AS A FUNDING REQUIREMENT
5. SCALING-UP

We will therefore elaborate, for each of these areas, the strengths, weaknesses and opportunities of, threats to as well as potential strategies for the future of co-creation in Europe. Additionally, for each section we provide a composite case study vignette to illustrate the tensions that emerge from our empirical cases. While the vignettes are entirely based on our SCALINGS fieldwork, they may combine elements from different case studies and therefore do not represent identifiable singular cases.

OVERVIEW

		STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	STRATEGIES FOR THE FUTURE OF CO-CREATION IN EUROPE
1	RECRUITMENT	The opportunity to participate in innovation processes as a member of the public	Opportunities for participation are socially stratified and often exclude socially, economically or politically disadvantaged members of society	Inclusive innovation processes and outcomes	Participation may be limited to socially, economically or politically privileged members of society	Projects must develop socially inclusive recruitment strategies
2	DECISION-MAKING POWER	A multi-stakeholder approach to innovation design	Often, there are stark power differentials between stakeholders	A plurality of perspectives and interests shape innovation design	Participation without decision-making power inhibits inclusive innovation design	Decision-making power must be shared between different actors
3	TECHNOLOGICAL VS. SOCIAL INNOVATION	Innovation aims to address societal challenges	Often, non-technological solutions are excluded from the start	Tackling societal challenges through the most suitable innovations	Choosing second-best innovations because of an exclusive focus on technological solutions	Social and technological solutions must be equally considered, no pre-commitments to technological solutions
4	CO-CREATION AS A FUNDING REQUIREMENT	Increasingly, funding agencies require public participation in innovation processes	Often, projects include public participation only to fulfil funding requirements without adequate planning	Funders can transform innovation practices and build co-creation capacities across Europe by requiring public participation in innovation processes	Without high standards in evaluation, including co-creation in research applications might become a mere check-box without transformative effects	Funders must build capacities to adequately evaluate co-creation activities with regard to their role in and impact on a project's research agenda
5	SCALING-UP	As co-creation becomes more common, there is a considerable potential for knowledge transfer between different co-creation projects	Unfortunately, knowledge transfer is often imagined as a mere copy-paste that does not take the specific situated contexts of the co-creation activity into account	Projects can learn from each other and adapt methods and approaches to their situated contexts	Projects and methods can fail if situated contexts are not taken into account	Projects need to engage in a detailed context analysis to successfully transfer co-creation practices between different local settings; this will often require the inclusion of social scientists as part of the project team

Many co-creation initiatives provide opportunities for lay people to participate in innovation processes. They advance the traditional notion of public engagement (engagement with innovations that already exist) by designing active roles for future users in the innovation process itself.

A

Recruitment

WEAKNESSES

However, these opportunities for participation are often socially stratified. The lay participants in co-creation thus tend to represent only fragments of society (e.g. higher income, higher education, no recent migration experiences), although the exclusion mechanisms at play are often unintentional.

OPPORTUNITIES

Co-creation can create opportunities for socially inclusive innovation processes and innovation outcomes that meet the needs of diverse publics.

THREATS

If social, political and economic barriers to participating in co-creation activities are not adequately addressed and overcome, participation might become limited to socially, economically or politically privileged members of society.

Strategies for the future of co-creation in Europe

Co-creation projects must be encouraged to develop detailed recruitment strategies that aim at social inclusion across social strata and groups, paying particular attention to ensure the participation of marginalized groups.

RECRUITMENT:
FROM DIVERSE EXPECTATIONS TO NON-DIVERSE REALITIES

PROJECT A explores opportunities for people across social strata to participate in a sustainable energy transition. The project is initiated by an NGO with a focus on sustainable development and green technologies. Together with members of the public, the NGO intends to co-create new applications for photovoltaic modules that do not require property ownership, for example modules that do not need to be permanently installed in a building, but which can be set up on a balcony. As a first step, the NGO conducts an open co-creation workshop to align existing solar photovoltaic technology with the needs of diverse publics. In a second step, two buildings and twelve individual households are selected to further develop and implement these new applications. To approach the public, the NGO selects as their test site a residential area with 1,000 inhabitants, including tenants with diverse social and educational backgrounds.

Planning the co-creation workshop, the NGO opts for an open invitation approach, advertising the event in the local newspaper, on the municipal social media channel and via posters and flyers spread out across the neighborhood. However, instead of the 50-100 participants they expect, only 20 individual residents and two representatives of a local housing company join the workshop. While the NGO is content that all of the participants exhibit a strong interest in the project, they realize that the participants do not at all reflect the diversity of inhabitants of the residential area. Rather, they all appear to be of retirement age, mostly male, well-educated and without recent migration experiences.

Even though they don't know how they could have proceeded differently, the members of the NGO sense that they have missed parts of the publics they wanted to include. Yet, given the time and resource constraints of the project, the NGO doesn't have the opportunity to thoroughly reflect upon its approach or try to reach out to all of the inhabitants again. Instead, they move ahead with the participants who attended the co-creation workshop, having to abandon their initial aim of including a diverse group of participants.

Co-creation gathers different actors in a joint innovation activity that aims to create mutually beneficial outcomes. Such a multi-stakeholder approach can enrich the innovation process through the different perspectives and knowledges that contribute to it.

Decision-making Power

WEAKNESSES

While many co-creation initiatives include a variety of actors, power differentials between stakeholders are common. This may take the form of formalized decision power and/or more informally assigned roles (e.g. experts vs. lay people) or pertain to who is involved in decision-making at which stage of the process.

OPPORTUNITIES

Bringing together a multiplicity of stakeholders and perspectives, co-creation can pave the way for a plurality of interests to be represented in innovation practices and their outcomes.

THREATS

However, if substantial power differentials between stakeholders persist, this inhibits socially inclusive innovation design and leads to innovation outcomes that only suit the needs of some actors in the innovation process.

Strategies for the future of co-creation in Europe

In order to benefit from the diverse perspectives that co-creation activities bring into conversation with each other, decision power must be shared between different actors.

DECISION-MAKING:
DIFFERENT ROLES, UNEQUAL POWER DISTRIBUTION AND THE "SPOKESPERSON"

PROJECT B is a public end-user driven initiative that aims to develop a robotic solution for comprehensive geriatric assessment, i.e. a set of standardized tests to evaluate the health and general living condition of elderly patients. A comprehensive geriatric assessment is time-consuming. A robotic solution would enable the elderly to conduct the assessment themselves and thus allow health professionals to spend more time on individual care plans. The project involves a consortium of engineers, companies and universities as well as a hospital including geriatric physicians, other health care professionals (nurses, doctors, social workers, etc.) and elderly people. The project consortium considers all potential end users to be important sources of knowledge and, as such, central to better aligning robotic solutions with the needs of health care professionals and patients. Simultaneously, the consortium only designates some of these envisioned users as being capable of fully taking part in the development process, including important design choices. Only the geriatric physician, who the consortium deems to have the required expertise, gets to represent geriatric practice throughout the project. The physician participates in shaping the initial problem definition and the use cases and scenarios that guide the engineers in the development process. Everyone else involved in the daily operations of the geriatric clinic, e.g. other health care professionals, elderly patients and their relatives, are excluded from both the problem definition phase and the development process. Instead, the consortium asks for their feedback only towards the end of the project, when the prototype already exists and only a few changes are still possible. Foregrounding the geriatric physician, who is traditionally perceived as an "expert", in the decision-making process also foregrounds their specific ideas of a good outcome, while other experiences, insights and types of expertise, despite being formally part of the co-creation activity, are neglected.

Many co-creation initiatives aim to address societal challenges and the everyday life problems of European publics.

C

Technological vs. Social Innovation

WEAKNESSES

However, social innovations (i.e. non-technological solutions) are often excluded from the start. This can occur explicitly, e.g. through funding requirements, or implicitly, e.g. through the dominance of business or research stakeholders in the process.

OPPORTUNITIES

By including diverse publics in the process of defining and addressing these challenges, co-creation projects can arrive at the most suitable innovation solutions to tackle societal problems.

THREATS

However, if social innovations are excluded, co-creation projects might promote second-best innovations and might not live up to their full potential for problem solving.

Strategies for the future of co-creation in Europe

In order to benefit from co-creation as a problem-based approach to innovation, social and technological solutions must be given equal consideration. Pre-commitments to technological solutions limit the innovation potential of co-creation.

TECHNOLOGICAL VS. SOCIAL INNOVATION:
PREMADE COMMITMENTS

PROJECT C is a municipal initiative that wants to approach challenges people encounter in their daily lives from a problem-based angle. The municipality does not want to pre-determine any specific kind of technology. Instead, it focuses on co-defining problems and challenges together with members of the public. At the same time, the initiative is partly funded by a regional digitalization initiative, which requires the development of potential prototypes to be part of the project, specifically smart technologies that connect to a data platform. The municipality organizes an open co-creation workshop for the members of the public to share their everyday challenges and discuss how the municipality could help to address these challenges. The workshop is well-attended and members of the public contribute a number of challenges across thematic areas. One particularly fruitful discussion is sparked by reports of inefficient waste collection and overflowing public waste containers. The members of the public not only describe this issue, but also discuss potential solutions. At this point, the municipal officials see an opportunity to connect the problem of overflowing public waste bins to a digital solution, as required

by their funders: they propose using sensor technology to measure the fill level of waste containers and automatically notify the utility provider whenever maximum capacity is reached. The members of the public, however, object strongly to the sensor-based solution and instead suggest "publics as sensors" by extending the use of an existing municipal platform for voicing complaints. Concretely, they propose that members of the public notify the officials via a phone call or online form if a bin needs to be emptied.

The municipality discusses the results of the workshop and identifies a conflict between the technological, i.e. sensor-based, solution they had in mind and the solution suggested by the members of the public, which draws on an already-existing platform and would not require piloting a new product. With the funding coming from a digitalization initiative and the local sensor company being strong supporters of the project, the public's suggestion does not seem as attractive or as publicity-effective as the technological alternative. Therefore, they decide to pilot a sensor-based solution, despite the public's preference for a different solution.

Increasingly, funding agencies ask for public participation to be part of applications for innovation projects.

Co-creation as a Funding Requirement

D

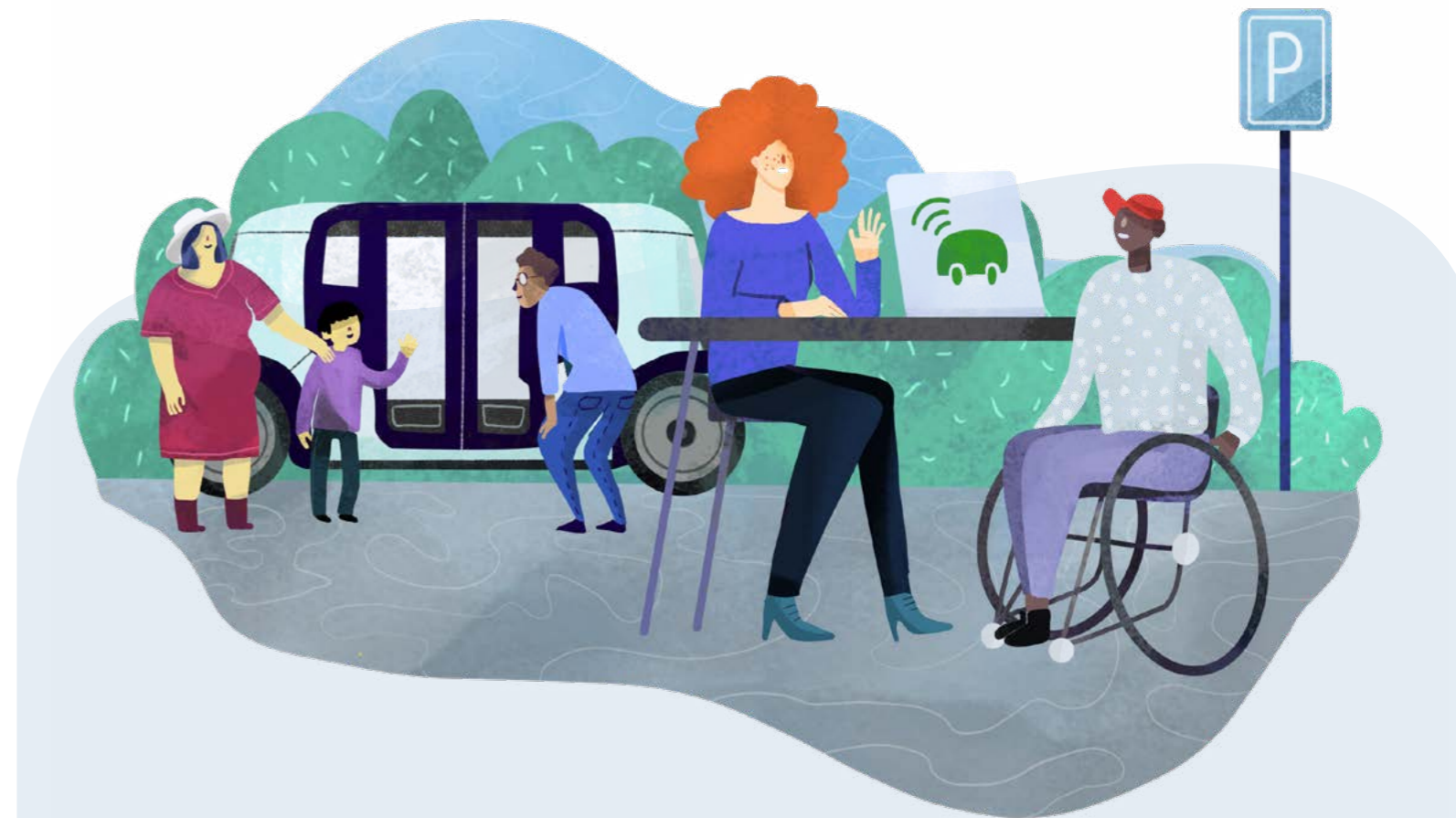## FUNDING:
PARTICIPATION AS A CHECK-BOX?

WEAKNESSES

At the same time, public participation is often only included in projects to fulfil the respective funding requirements. Such an approach neglects sincere considerations about how meaningful participation should be designed and implemented in a case-specific way.

OPPORTUNITIES

By making public participation a requirement for funding, funders can transform innovation practices and build co-creation capacities across Europe.

THREATS

However, without high standards in evaluation that take into account the state-of-the-art in co-creation research, the inclusion of co-creation in research applications might become a mere check-box without transformative effects on the research and development agendas of projects.

Strategies for the future of co-creation in Europe

To ensure that requiring public participation as part of research projects has a transformative effect on research and development in Europe, funders must build capacities to adequately evaluate co-creation activities with regard to their role in and impact on a project's research agenda.

PROJECT D aims to develop a pilot scheme for the use of autonomous vehicles in pedestrian and road areas. The project is coordinated by a consortium of technological stakeholders (a university, an independent research institute and a group of manufacturers) and intends to hold two field trials in a public space as major milestones. For this, the consortium seeks funding from a public institution. Knowing that the funding institution requires a co-creative element in all innovation projects, the consortium decides to include a co-creation component in their field trials. The project receives funding and is excited to test and refine the properties of autonomous vehicles in what the consortium hopes to be real-life settings.

To achieve this, the consortium decides to conduct two field trials in the carpark of a local shopping mall on regular weekdays. Planning these trials, they invest most of their resources and effort into the technological setup as well as in meeting the legal conditions. They also put up a small information desk where interested members of the public can inquire about the project. However, the consortium does not reflect upon what co-creation could mean beyond setting up an information desk, such as how they could approach members of the public and how they could incorporate public feedback in the further course of the project in meaningful ways. Instead, they report those who happen to be present at the carpark as the engaged public participating in their trials.

While the funding institution attaches great importance to co-creation, Project D approaches it as a necessity that needs to be fulfilled, but which does not require sincere consideration. As a result, engagement remains a mere buzzword that is not translated into effective practice and fails to have transformative effects on the project's agenda.

As co-creation becomes more common in research and development projects across Europe, there is a considerable potential for knowledge transfer between different co-creation projects.

E

Scaling-up

WEAKNESSES

However, many co-creation projects imagine knowledge transfer as a simple copy and paste activity that does not take the specific situated socio-cultural contexts of their projects into account.

OPPORTUNITIES

Projects across Europe can learn from each other and adapt methods and approaches to their specific situated contexts.

THREATS

However, if local socio-cultural contexts are not taken into account, both individual co-creation projects and co-creation as a novel mode of knowledge production in Europe could fail.

Strategies for the future of co-creation in Europe

Projects need to engage in a detailed context analysis to successfully transfer co-creation practices between different local settings. Transfer always requires adjustments to match the co-creation approach to the specific context. Adequately understanding local socio-cultural contexts often requires the inclusion of social scientists as part of the project team.

SCALING-UP:
CONTEXT MATTERS

PROJECT E wants to test ambient-assisted living technologies in a living lab setting that is connected to a residential care home for the elderly. As such, the project is part of a larger robotics consortium that gathers knowledge created at a number of different robotics living labs across Europe.

Unlike most of these living labs, the roboticists from Project E do not consider technology the ultimate solution to the challenges in assisted living and elderly care. Therefore, they decide to involve social scientists and psychologists to accompany the project and provide a critical perspective on the social shaping of robotics. The social scientists also influence the extent of participation in the co-creation process. For instance, they arrange a collaboration with several local civil society organizations, specifically to invite people into the lab who would otherwise have been excluded.

Project E not only advances assisted living together with the local public, but also generates a repository of knowledge about interdisciplinary and participatory approaches towards new socio-technological arrangements. While this is unique compared to the other living labs existing under the same umbrella, the European consortium starts to acknowledge the experiences Project E is making with their inclusive take on co-creation. For the next large-scale robotics initiative, the consortium requires living labs to map the local landscape of stakeholders, including civil society organizations and the relevant social scientists, and mandates involving them throughout the project.

Despite starting out as the odd exception among the consortium partners, Project E emerges as a role model for inclusive collaboration with a transdisciplinary group of local stakeholders. Here, the European consortium considers scaling-up to be based on the adequate analysis and understanding of local contexts, instead of trying to transfer entire project plans or technologies. This allows future living labs to share knowledge and experience without losing sight of the local particularities their projects are embedded in.

INTRODUCING THE SOCIAL IMPACT ASSESSMENT FOR SOCIALLY INCLUSIVE AND RESPONSIBLE CO-CREATION

Based on our analysis of the strengths, weaknesses and opportunities of, as well as threats to, co-creation as a novel approach to innovation in Europe, we have developed a "Social Impact Assessment for Socially Inclusive and Responsible Co-creation". This assessment tool aims to guide co-creation actors towards designing and implementing socially inclusive and responsible co-creation activities. We recommend that:

Policymakers draw on the Social Impact Assessment to provide policy frameworks that foster socially inclusive and responsible co-creation.

Funders provide the Social Impact Assessment to potential applicants to support them in the design of their co-creation activities.

Individuals or institutions who aim to engage in co-creation use the questions of the Social Impact Assessment to guide the design and implementation of their co-creation activities.

Members of the public use the Social Impact Assessment to evaluate their participation in co-creation activities and potentially suggest improvements to their co-creation partners.

Our SWOT analysis has shown that five categories (recruitment, decision-making power, technological vs. social innovation, co-creation as a funding requirement, scaling-up) emerge as being particularly relevant. To assess how a project performs with regard to these five categories, we have developed the following sets of questions that address essential aspects of the design and implementation of a co-creation project.

SOCIAL IMPACT ASSESSMENT FOR SOCIALLY INCLUSIVE AND RESPONSIBLE CO-CREATION

1 RECRUITMENT

- Who do you see as relevant stakeholders for your project? Who do you aim to involve?

- Who will be affected by the processes and outcomes of your project?

- Is there a mismatch between affected and relevant stakeholders? If so, why?

- Does your project involve the participation of members of the public?
If so, how will you select the participants?

- Are there certain members of the public that you consider more attractive as participants than others?

- Are there explicit or implicit barriers that could exclude certain members of the public from participating? If so, how will you lower these barriers?

- How will your project ensure the participation of disadvantaged groups, taking into account gender, ethnicity, socio-economic status, age and sexual orientation?

2 ENGAGEMENT METHODS

- What kinds of engagement methods does your project involve? At which stages?

- Does your project team have the adequate expertise to work with these methods?

- How do these methods correspond with the aims of your project?

- How will you record the results of the engagement activities?

- How will you take into account these results in the further course of your project?

- How will the results influence the process and outcomes of your project?

3 AGENCY

- What are the different kinds of agency that the project actors hold?

- Who has what kind of power over what/whom in the process of co-creation?

- Are power relations informal or formalized?

- Are there power differentials between actors? If so, are they intended? If yes, why? If they are not intended, how will you resolve them?

- How will you resolve potential conflicts?

4 BENEFITS

- Who do you see benefitting from your project, now or in the future?

- Which concrete benefits (e.g. financial, social, political, etc.) might occur for whom?

5 RISKS

- Do you foresee any risks or negative effects? If so, please describe them.

- Who would be affected by risks and negative effects?

- How will you monitor potential risks and negative effects throughout the project?

- How will you mitigate risks and negative effects?

6 OUTCOMES

- What would you describe as a successful outcome of your co-creation activity?

- What are the evaluation criteria you apply to determine this success?

- Who defines these criteria? Will you involve project participants in this definition?

- Does your project consider social or technological solutions to the problems it addresses, or both?

7 SCALING-UP

- Does your project aim to implement knowledge or approaches from any previous or existing projects in other contexts?

- If so, how does the context of your project differ from the previous or existing projects?

- Which challenges for socially responsible co-creation might your specific context pose?

- How are you going to meet these challenges and adjust your approach?

Co-creation, if taken seriously, requires time, space and continuous effort throughout the innovation process. The Social Impact Assessment provides those who want to co-create with practical guidelines for designing and implementing socially inclusive and responsible co-creation activities. Importantly, these co-creation activities will aim to include diverse publics and will be tailored to their specific local contexts and take into account their socio-cultural specificities. As a result, co-creation may indeed contribute to more inclusive and socially responsible forms of innovation in Europe that will help address the multiple challenges today's societies face as well as create new opportunities.

ADDRESSING LEGAL ASPECTS OF CO-CREATION

Introduction:
Co-creation and the Law

Many factors contribute to how co-creation practices are situated in particular socio-political contexts. One of these factors is the applicable legal framework. The law does not just foster or hinder co-creation but allows, enables, complicates or prohibits specific elements of it. Successfully scaling up co-creation practices depends on many legal factors. For policymakers at the European and the national level, three areas are particularly relevant:

PUBLIC PROCUREMENT
LAW

INTELLECTUAL PROPERTY
LAW

EXPERIMENTAL
LAW

PUBLIC PROCUREMENT LAW

PUBLIC PROCUREMENT LAW — Fostering Innovation through Public Purchases

RELEVANCE

The primary objectives of public procurement law are to guarantee that the public sector, when acting as a purchaser on the market, spends public money **efficiently and fairly**. Open procurement procedures achieve these aims through **transparency and rigidity.** For example, if the state purchases traffic lights or equipment for public schools, the procurement procedure involves stating the specific product that is required and the selection criteria (e.g. lowest price, best quality/price ratio, etc.).

To stimulate innovation and to create new markets, there are other procurement procedures that are more flexible than open procedures. **Flexible procedures**, in contrast to open procedures, allow for functional definitions, subsequent negotiations and collaborations between the public purchaser and the tenderers during the procedure.

EXAMPLE 1

The state does not purchase a specific software product but a general technological solution for adequately processing social security applications.

EXAMPLE 2

Instead of purchasing new lamps to replace existing streetlamps, the city administration initiates a partnership with a company to implement an innovative, energy-efficient lighting system for the whole city.

EXAMPLE 3

The municipality purchases an innovative solution for rainwater management in the district rather than using existing products, because those are unfit for the municipality's requirements.

LEGAL FRAMEWORK

Innovative **procurement procedures** include:

- **A competitive procedure with negotiation**, where the subject matter of the public procurement contract is clear but technological details can only be described functionally

- **A competitive dialogue**, where the subject-matter is determined in a dialogue between purchasers and tenderers

- **An innovation partnership**, when there is no solution available on the market for the purchaser's needs, making research and development activities a prerequisite for subsequent purchases

The details of these procedures are defined in **Articles 29-31 of the EU Public Procurement Directive.** The member states have transposed these rules into national law.

FINDINGS AND RECOMMENDATIONS

FINDING 1

Procuring a research & development (R&D) activity without a specified outcome falls under public procurement rules only if the public purchaser reserves the results from the R&D services (e.g. intellectual property rights) for itself. If the public purchaser does not reserve the results for itself, state aid law applies.

RECOMMENDATION 1

The public purchaser should organize the process through a public procurement procedure from the beginning if a purchase after the R&D phase is planned. Otherwise, the participants of the R&D phase would have an unfair advantage as tenderers in the subsequent public procurement procedure.

FINDING 2

Flexible procurement procedures conflict with economic efficiency and fair competition. The more flexibility the procedures provide, the more risks for discrimination and arbitrary decisions they entail.

RECOMMENDATION 2

Legislators should clarify which deviations from the principles of economic efficiency and fair competition in innovation partnerships are necessary and therefore acceptable. This can help to minimize the public purchaser's risk of legal challenges against innovation partnerships by unsuccessful tenderers.

FINDING 3

After an innovation has been developed, the market for it tends to close because its developer has a head start in know-how and a potential monopoly on the intellectual property rights. In the procurement context, this is particularly problematic because the development of such closed markets is subsidized with public funds.

RECOMMENDATION 3

Legislators should promote suitable distribution of the intellectual property rights between the public purchaser and the tenderer, which is key to ensuring that the markets created remain open. If included in the purchasing contract, this safeguard can help to counteract lack of competition in innovative procurement procedures.

INTELLECTUAL PROPERTY LAW

Protecting the Results of Co-Creation

RELEVANCE

With innovation generally, it is important to know who owns the intellectual property rights (IP) of the innovation. In co-creation processes, diverse and dynamic circles of people collaborate in makerspaces or innovation hubs at "smart campuses" and have diverse tasks and responsibilities. Here, the clear distribution of IP rights is particularly important.

EXAMPLE 1

A group of students develops a smartphone app for a neighborhood center together with lay people from the community, using resources provided by a university's innovation hub. Who owns the source code of the smartphone app?

EXAMPLE 2

A research consortium uses a third-party provider's test facilities to create a health-care robot prototype for use in nursing homes. Who owns the construction plans? Who owns the non-personal data (e.g. performance records, classification results generated through machine learning processes) generated in the test facility and the nursing home?

EXAMPLE 3

A team of entrepreneurs writes a concept note for a sharing economy business idea. One member of the team contributes the key idea during the discussion process but does not co-author the concept note. Who owns the idea?

LEGAL FRAMEWORK

The most relevant legal frameworks for protecting innovation outcomes are:

COPYRIGHT LAW

protects literary works, artistic works, databases and other types of creative works.

PATENT LAW

protects registered, new inventions that could be used industrially.

TRADE SECRET LAW

protects business information by keeping it secret.

Apart from these core areas, data protection law and general principles of contract law can be relevant.

The legal sources for these frameworks are sometimes spread out over multiple legal acts on the EU and national level. For example, important sources for copyright law in the EU are the **EU Software Directive**, the **EU Database Directive**, the **EU Term Directive** and many more directives, as well as national laws. In other cases, the sources are more centralized. The basic rules of EU Trade Secret Law, for example, are mainly found in the **Trade Secret Directive,** which has led to a high degree of harmonization of national laws on trade secret protection.

Which legal framework applies depends on the type of innovation outcome. Whereas research papers are protected by copyright, mere ideas without a concrete expression are not. Whereas new software for running robotics applications is usually protected by copyright law, new hardware falls under patent law. Non-personal data are not covered by data protection law. But if the data are structured in a certain way, they may be protected as a database under copyright law.

FINDINGS AND RECOMMENDATIONS

FINDING 1

Some co-creators contribute "only" equipment, infrastructure or ideas without actively taking part in research. These inputs are usually not protected by IP law and do not result in a right to (co-)exploit the innovation or claim any revenues.

RECOMMENDATION 1

Co-creators should be encouraged to contractually determine what kinds of contribution they acknowledge or financially compensate, even if the contribution is not protected by IP law.

FINDING 2

If a data set does not contain personal data, it does not fall within the scope of European Data Protection Law. For specific cases, such as machine-generated non-personal data (e.g. performance data of a robotics prototype or unstructured classification results of traffic sign images), database law or trade secret law may apply. However, in the majority of cases, the (co-)ownership of non-personal data is a matter of contract law.

RECOMMENDATION 2

Co-creators should be encouraged to contractually tailor the terms of data ownership to the specific co-creation project.

EXPERIMENTAL LAW   Testing Innovations
and their Regulation

RELEVANCE

In some cases, there are legal obstacles to testing innovations under realistic conditions. Temporarily removing such obstacles may be helpful not only for innovators to learn how the innovation performs, but also for policymakers to optimize future regulation. The Council of the EU has recently published **conclusions** on the usefulness of experimental law instruments.

EXAMPLE 1

Automated cars cannot be tested in public spaces if they are not approved for use on public roads. How traffic participants react to public tests of automated cars could provide insight about if and under what conditions legislators should allow automated cars.

EXAMPLE 2

Healthcare robots cannot be tested in hospitals if the professional obligations of doctors and nurses preclude them from delegating tasks to automated medical devices. Observing specific test situations where healthcare robots are used can inform policymakers if changes in medical device law or professional law are necessary.

EXPERIMENTAL LAW

LEGAL FRAMEWORK

Different legal instruments can be utilized to remove legal obstacles and inform policymakers about ways to regulate innovation in the future:

EXPERIMENTAL STATUTES

are laws adopted in parliament only for a limited period of time. At the end of this period, results are evaluated to indicate whether the rule should be extended indefinitely.

EXPERIMENTAL CLAUSES

are statutory provisions that allow executive authorities to deviate from other specific provisions for the purposes of experimentation.

REGULATORY SANDBOXES

are administrative experimentation concepts in areas where a license is necessary to participate in the market. The competent supervisory authority may issue individualized authorizations for experiments to sandbox members.

FINDINGS AND RECOMMENDATIONS

FINDING 1

In specific situations, where the purpose of the law and the purpose of the innovation are diametrically opposed, experimental law instruments can help to offer a nuanced regulatory response.

RECOMMENDATION 1

Define the problem that the experimental law instrument ought to solve and find the most suitable approach for each individual situation. For example, experimental clauses and regulatory sandboxes allow more variation in experiments; experimental statutes allow for more transparency and broader public participation.

FINDING 2

Every experimental law instrument requires a statutory basis and can only be adopted on the EU level in areas where EU legislators have the competence to do so.

RECOMMENDATION 2

Policymakers need to determine who is competent to provide the legal basis of an experimental law instrument. Legislators need to make sure that the requirements of the rule of law are met when delegating experimental discretion to the executive branch.

FINDING 3

Generating knowledge is key. This may involve knowledge about the technology to be tested, its impact on society, the applicable law and necessary legislative changes.

RECOMMENDATION 3

Make access to and public participation in the co-creation process as easy as possible but as individualized as necessary. Create effective evaluation and reporting mechanisms.

Co-creation practices have many different legal implications. Depending on the role of actors and the state in the co-creation process, different legal areas are relevant:

Public procurement law is relevant to the relationship **between co-creators and the state as public purchaser.** The state can foster innovation by procuring it, but only within the limits of economic efficiency and equal treatment.

Intellectual property law is relevant to the relationship **among co-creators**. Default rules on co-ownership of intellectual property will not always yield results that represent the importance of each individual contribution. Only individual contractual solutions can mitigate this.

Experimental law is relevant to the relationship **between co-creators and the state as regulator**. Differentiated use of experimental statutes, experimental clauses and regulatory sandboxes can temporarily remove legal obstacles and contribute to optimized regulation in the future.

CONCLUDING RECOMENDATIONS FOR STAKEHOLDERS

This roadmap has elaborated important social, political and legal opportunities for and challenges to co-creation as a new mode of innovation in Europe. Below we have summarized key recommendations for different stakeholders who might be involved in co-creation activities. This overview indicates different access points for different stakeholders to engage with the SCALINGS Roadmap.

STAKEHOLDERS	ACTIONS
Policymakers	▪ Keep in mind that co-creation only fosters socially inclusive and responsible innovation if active efforts are made to include diverse publics in the process. ▪ Be aware that mainstreaming or scaling up co-creation will only be successful if the specificities of local socio-cultural contexts are taken into account. ▪ Draw on the Social Impact Assessment to provide policy frameworks that foster socially inclusive and responsible co-creation. ▪ Encourage the public procurement of innovation, but be mindful of the limits of economic efficiency and equal treatment. ▪ Use experimental law concepts selectively to foster innovation without undermining the rule of law.
Funding institutions	▪ Clearly communicate that public participation in innovation is not a check-box requirement: Encourage applicants to submit well thought-out plans for their co-creation activities. ▪ Provide applicants with the Social Impact Assessment to support them in the design of their co-creation activities. ▪ Possibly make engaging with the Social Impact Assessment tool a mandatory requirement for the submission of applications.
Co-creation practitioners public and private	▪ Invest time and effort into planning, conducting and evaluating the co-creation activity. ▪ Carefully analyze the specific socio-cultural context in which your co-creation activity takes place. This might require involving social scientists in your project. ▪ Identify disadvantaged groups that might easily be excluded from your co-creation activity and make specific efforts to include them. ▪ Use the Social Impact Assessment to support the socially inclusive and responsible design and implementation of your co-creation activity. ▪ Make sure you are aware of relevant legal issues that might emerge from your project and address them. ▪ Find contractual solutions to acknowledge co-creation inputs that are important but fall outside the scope of IP law.
Members of the public	▪ Use the Social Impact Assessment to evaluate the co-creation activities you are involved in and to inspire change towards more socially inclusive and responsible practices.

▪ POLICY RECOMMENDATIONS   ▪ LEGAL RECOMMENDATIONS

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