SOCIETAL ENGAGEMENT
WITH KEY ENABLING TECHNOLOGIES

Deliverable D2.1

Concept and guidelines for co-designing case studies and testing tools for industry

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Abbreviations

AI: Artificial Intelligence
CSO: Civil Society Organizations
ICF: Informed Consent Form
KET: Key Enabling Technology
RRI: Responsible Research and Innovation
R&D: Research and Development
R&I: Research and Innovation
SE: Societal Engagement
SL: Social Lab
STI: Science, Technology and Innovation
WP: Work Package

1. Introduction

The preparation of this manual is the starting point of WP2 which will kick off the action-research component of the SocKETs EU Horizon 2020 funded project. In this WP, exploration, experimentation and co-creation will be stimulated and encouraged between the stakeholders that will be invited to take part into the SocKETs Labs. The purpose of this manual is to provide a field guide that can help the SocKETs project team members when setting up the labs and promoting their development during its different stages.

To achieve this goal, the manual pays special attention to what constitutes societal engagement (SE) processes entail and the challenges associated with it. It also defines what SocKETs Labs are and describes the main components, features and stages of the process. It pays specific attention to the roles, tasks and workflow that happen into a lab, trying to present what are the main "momentums" that will occur during the lifespan of a lab.

Co-creation activities taking place in the labs will allow us to test tools and practices to promote citizen engagement in Key Enabling Technologies (KETs) research and development (R&D) processes, taking into account the findings of WP1 (innovation ecosystems particularities, cultural conditions, indicators and narratives) in three main areas where the SocKETs project is acting: circular economy, eHealth and industrial automation.

We hope that this manual will be useful for the SocKETs Lab team members for organizing the WP2 activities, but there are also limitations as it is only a compilation of guidelines, resources, tips and tools. We also encourage to reflect on the different stages of the process and to reflect on the different sections of the manual to extend its impact and improve its usefulness.

The structure of the document starts by framing the scope of the manual. The third section provides an explanation of critical elements of SE. The fourth section describes the key elements of the SocKETs Lab. The fifth section provides the description of the different stages of the process (diagnosis, setting up, implementation and evaluation) and the sixth section incorporates the main tasks, roles and tools needed in the lab. Last, some templates that will be needed during the "labbing" process are incorporated in the annexes.

1.1. The purpose of the SocKETs labs

The purpose of the labs is bringing stakeholders from different sectors and with different perspectives together to 1) discuss societal challenges and how KETs contribute to solving these and 2) engage in collaborate activities and experiments that address societal challenges in the field of the lab participants. We do this with co-creation tools. The purpose and the expectations to the lab participants are further described in Annex 8.2.

Most elaborated in this manual, is the aspects of social engagement. Promoting of social engagement and co-creation can be seen as a meta-purpose that the SocKETs partners keep in mind in their methodological approach. Whereas the dialogue on technology and societal challenges is the primary purpose of the lab in our communication with and recruitment of lab partners.

2. Scope of the manual

This manual aims to guide SocKETs Lab managers, assistants, facilitators, and the rest of the SocKETs project team members to setting up, development and evaluation of the six SocKETs Labs during Sep 2021-July 2022. It is also a document that can help towards the use of co-creation tools and its testing in the six SocKETs Lab across Europe.

This manual is not a strict guide to be followed step-by-step. It aims to provide a theoretical framework, some tools, resources and past lessons for envisioning some of the major challenges, problems and barriers that will be faced by SocKETs Lab team members. The manual does not entail a fixed or a comprehensive process. It only describes the main stages and workflows that can occur at the six SocKET Labs, trying to provide some insights, key principles, and a variety of practical tips that can inspire the six SocKETs Labs members throughout the development of the SE activities.

2.1. Training of SocKETs lab leaders

This manual and associated materials will be presented and discussed in several online training sessions for SocKETs partners that will take place before starting the SocKETs Labs.

The manual is envisioned as a basic document and will be supplemented or revisited according to the Labs' needs and inputs expressed during those trainings. The manual will also be supplemented by lab leaders developing and sharing their workshop agendas, process plans and recruitment strategies.

On the first two training sessions, as a minimum the following elements will be presented and discussed:

- Social Lab method
- Purpose and flow of the three workshops
- Timeline for the process
- Strategy for recruitment of lab participants

3. Aspects to be considered in SocKETs societal engagement process

3.1. What is a societal engagement process?

Societal engagement (SE) means engaging societal actors and citizens in research and innovation (R&I) activities at different levels of R&I processes to better address the challenges society faces today and by developing new forms of governance in the field of science, innovation and technology (STI). The level of engagement can vary from informing the citizens to giving them the entire control of the process. In the SocKETs Labs, engagement processes will have a variety of different stakeholders coming from an innovation ecosystem connected to the technologies addressed: citizens as well as representatives of different perspectives of the ecosystem. As defined in Deliverable D1.3 Report on framework for organising the SocKETs toolbox, SE is seen as a way to keep science and innovation open to continuous social monitoring taking the priorities, expectations, and concerns of citizens into account, making it more 'socially robust' (Nowotny, 2003). Reliable knowledge is not only created by the scientific method but is highly dependent on their 'reliability' in their societal context. Therefore, to navigate the complexities between knowledge, decision-making, expertise and action in science and innovation, it is of importance to not only consider knowledge required through the scientific method, but also experiences, attitudes, perceptions and vulnerabilities of participants and stakeholders in order to steer innovation trajectories towards desirable and acceptable ends (Nowotny, 2003)

3.2. Co-creation in SocKETs

Co-creation is one of the tools we intend to use for societal engagement. Co-creation is a concept that has been widely used across many contexts. One of the earliest descriptions of co-creation comes from work on (lead) user innovation by Von Hippel, where co-creation implies participation of end-users in a development trajectory into a firm (von Hippel, 1998). The involvement of various actors in innovation processes is an issue that has been popularized by previous paradigms, such as open innovation, to develop competitive advantages. The previous literature has scrutinized the phenomena in terms of user innovation, open source innovation, household sector innovation, crowdsourcing, or free innovation among others (Chesbrough, 2003; Surowiecki, 2005; von Hippel, 2005, 2017). What is common to all these concepts, is the involvement of user or consumers in innovation activities in various degrees and manners.

Furthermore, it is important to distinguish co-creation as understood and used in a business context, and co-creation or co-production as used (interchangeably) and developed in the context of public sector (De Koning, Crul, & Wever, 2016; Voorberg, Bekkers, & Tummers, 2015).

In a business context, co-creation encourages end-users to add value to product development by sharing their experiences with the use of products and services, and thereby provide competitive advantage to a firm.

In the public sector co-creation has been advanced as a concept for involving citizens (end-users) in social innovation processes. Our starting point is this public sector notion of co-creation, in which participation is understood as active involvement in the development of an innovation trajectory. A notion we during the project experiments with, aiming at breaking down barriers and evolving synergies between this and the traditional business notion of co-creation. Participation therefore implies citizens as active co-developers of priorities, expectations and concerns in an innovation trajectory.

3.3. Reasons to select the Social Lab approach

KETs will allow European industries to retain competitiveness and capitalise on new markets by transforming existing modes of production: advanced manufacturing, advanced materials, life-science technologies, artificial intelligence (AI), micro/nano technologies, photonics, security and connectivity. In this sense, KETs will leverage innovations that will contribute to the progress of society. In order to facilitate a conversation between technologies and society, societal actors have to be involved as they are a valuable source of knowledge about societal needs and values, and about what practically works in other contexts.

The strength of the Social Lab (SL) approach consists in its ability to bring together different actors, their knowledge, and expertise and apply it to solve complex problems. This method allows understanding societal needs through dialogue, different solutions to be tested, with results shared and discussed in such a way that barriers and problems can be overcome collectively.

3.4. Some challenges of implementing societal engagement tools for industry

We have considered the challenges and potential risks in implementing SE activities in the different SocKETs Labs. From the SocKETs Consortium experience and from the results of WP1 we have gathered the main difficulties (general ones can be found in Deliverable 1.3) and challenges specific to each region.

- The established silos in R&I between technological sciences, engineering, and social sciences/humanities.
- Create common grounds to establish a dialogue between the business world (technology developers, companies, start-ups, venture capital, etc.) and society (civil organizations, citizens, etc.), and work together to achieve aligned goals.
- The inclusion of societal concerns in the design of the innovation trajectories and its outcomes (such as AI, nuclear waste, genetic modification, cyber security etc.) because of the

gap that exists between R&I communities and society in general (and in particular some specific collectives).

Consequently, the potential of SE in KETs developments today is far from being fully realized, utilized, and consolidated. SocKETs will provide opportunities to overcome these different kinds of separation: SocKETs Labs will apply collaborative as well as participatory and interactive approaches to generate exchange, engagement, and commitment to KETs development. As an example, one of the aims of the SocKETs Lab based in the Basque Country and tackling industrial automation is to set up a forum with a diverse range of stakeholders affected by and interested in the increasing and ongoing introduction of AI technologies into manufacturing. This will entail fostering a dialogue throughout the different workshops and activities that will be held into the SL among very different stakeholders, such as KETs developers (research, industry, clusters), trade unions, CSOs, innovation agencies, public administration, etc.

Previous experiences such as in the GoNano[1] project provide these overall recommendations for mainstreaming and implementing a co-creation process:

- Identify needs and entry points for co-creation
- Map the innovation context
- Showcase the benefits of co-creation
- Implement a structured methodology
- Balance co-creation and R&I objectives in scheduling
- Ensure understanding between perspectives of researchers, stakeholders and society
- Restructure the environment: Create a culture of co-creation

3.5. Cultural conditions in each lab

Another important aspect to pay attention is the kind of cultural conditions that will shape the development of each of the labs. These cultural particularities have been the subject of an investigation carried out in Work Package (WP) 1 in a dedicated deliverable (Augustijn, Willems, Nabuurs, & Kupper, 2021). In this sense, it is important to stress the differences that can be found in the six regional ecosystems, but also to build on the synergies that have been identified among them.

Italy

[1] http://gonano-project.eu/d5-3-collection-of-the-gonano-white-papers/

In Italy, there are strong regional differences concerning regulatory framework, presence of industries, economic conditions, but also cultural conditions, so it will be crucial to take regional characteristics into account when designing and conducting the SocKETs Lab. At the same time, a strong cultural tradition in deliberation and participation is missing. In many sectors, including building and construction as well as waste management. Therefore, transparency and intentions need to be communicated clearly.
However, the general public perceives technology as a way to move out of a competitive lag in comparison to Europe. This could be a relevant entry point to approach citizens for engagement activities.
Finally, specific characteristics (e.g., high business fragmentation, prevalence of artisan approaches mainly based on unskilled manual labour) and attitudes (e.g., hesitancy to use recycled materials, scarce attitude to cooperate between stakeholders and with respect to innovation) are relevant and should be taken into account.

Spain

The Industrial Automation SocKETs Lab will be implemented in a cultural environment where some conditions may favour its development while others might pose some challenges. In one hand, the Basque Country is a forerunner in matters of technological innovation and industry which provides a rich regional ecosystem of actors, where AI sector is particularly gaining momentum in the last years. In contrast, the dominant view of science-society relations coexisting in society are characterized by distrust towards national and regional politicians, which could affect the levels of trust of society in industry and technology as well. This distrust, in addition to a moderate public engagement culture in the region, could hinder SE in the Industrial Automation SocKETs Lab. These issues will be considered when designing the Lab, trying to anticipate the potential barriers that might arise and explicitly defining and communicating the benefits and incentives for co-creation.

Estonia

In Estonia, the SocKETs Lab should be welcomed by a generally positive attitude towards science and technology. Most Estonians appear to have a positive attitude and will probably not be averse to taking part in a project about technology, and in a process of collaboration with actors invested in innovating current practices. Nevertheless, this dominant view of science-society relations cultivated by the government, can be seen as a 'double-edged sword' where optimistic attitudes might not be so widely held as presented. Alternative imaginaries co-exist in Estonia. It will probably require tailor-made efforts to motivate people from such groups to participate in events. The engagement process should be carefully designed to give space to discontent without disregarding them as emotional or irrational. The Estonian SocKETs lab should be careful in exclusively using inclusive activities, not only in terms of recruiting a diversity of participants but also in their design.

Serbia

Serbia is a post-socialist country, where many governmental processes are non-transparent and corruption is present. This has influenced the public perception of science and innovation, because of its affiliation with this untrusted government. The Serbian SocKETs lab should develop transparent engagement practices with clear intentions and motives. More especially about eHealth, the field addressed by the Serbian SocKETs lab. The Lab should use tools that emphasize reflexivity and equality to set against the unbalanced doctor-patient relationship in the healthcare hierarchy. The cultural environment in which the Serbian SocKETs lab will occur is also divided between generations: elder Serbs are more concerned about 'falling behind' and experience poverty while younger generations are more optimistic about the future. The Lab should ensure that all generations are sufficiently represented and able to openly talk about the underlying values, needs, and concerns that come with this intergenerational gap.

Bulgaria

The cultural conditions in which the Bulgarian SocKETs lab will occur offer both opportunities and difficulties. First, expectations of economic advantages of STI are large, leaving little room for critical concerns of citizens. It is important in developing engagement events to make space for addressing possible negative impacts. Secondly, eHealth – the topic addressed by the Lab - seems a relevant and urgent topic for Bulgarian citizens. Engagement practices can make use of this 'urgency' in engaging citizens. In contrast, there might be a disbalance between technology owner/developer and citizen that engagement activities must overcome to ensure that everyone is given a voice.

Denmark

The Danish lab study is focused on wearable electronics and health. Here, several outreach activities will be conducted which includes webinars, workshops & seminars etc. These co-creation activities will have a diverse range of stakeholders that are interested in different eHealth monitoring and diagnosis devices. Co-creation is a two-way co-producing activity where innovative alignment of knowledge, needs, concerns and perspectives in KETs is taken into consideration. A co-creation dialogue between the different stakeholders (several Danish companies, working within medical diagnostics and health care as well as several innovation networks such as Danish Healthtech and Danish Manufacturing, the University of Copenhagen, University of Aarhus, the Technical University of Denmark, and Danish Ministry of Science and Education) will be initiated. By involving the broadest possible range of stakeholders in innovation process will of course result it challenges. One of the greatest challenges with eHealth is not whether the technologies will be capable enough to be useful, but rather ensuring their adoption in daily practice both with healthcare professional and citizens. For them to be used, several other values and principals should be considered such as privacy and data protection, data ownership, informed consent, trust, inequality, reliability etc. Especially, trust between the stakeholders involved must be formed from the beginning of the

activity. The eHealth monitoring and diagnosis solutions SocKETS Lab will be initiated in Denmark, who have one of the most advanced uses of eHealth as well as a higher developed innovation healthcare ecosystem in Denmark. The awareness and the cultural approach toward eHealth is high, which is a huge advantage for new eHealth devices. However, both the Danish citizens and healthcare professionals' confidence in actors outside of the Danish healthcare system is low. Another issue is the inequality between education backgrounds and eHealth, which results in some of the uneducated citizens getting lost in the development of new eHealth devices. These issues will be considered in the design of the SocKET Labs, so likely barriers that might occur in the communication will be beneficial for the co-creation process.

4. Key elements of SocKETs Labs

4.1. What is a Social Lab?

The SL term was coined by Zaid Hassan in his book "The Social Labs Revolution: A new approach to solving our most complex challenges" (2014). But this idea is not coming from nowhere and its origins can be traced back to several decades ago, intimately aligned with some pioneering ideas in innovative education (Tabarés Gutiérrez & Bierwirth, 2019). Ideas and approaches such as "Learning by doing" (Dewey, 2009), constructionism (Papert & Harel, 1991), critical pedagogy (Freire, 1974) and communities of practice (Wenger, 1998) are some of the key elements that can be observed in the SL proposition. Moreover, its positioning also comes from a previous further development of "citizen labs", "urban labs" or "media labs" that started during the end of XX century (Romero-Frías & Robinson-García, 2017).

In the last years we have observed how SLs have been extensively developed across the world in different topics. In Horizon 2020, for instance, projects such as New HoRRIzon[2], RI Configure[3] or Co-Change[4] have also employed this methodology for promoting RRI into different EU R&I contexts. The popularization of SLs across multiple contexts responds to the increasing needs of collaboration between different stakeholders that impose societal challenges. That is why these forms of participation have been growing in recent years (Takeuchi et al., 2014). In a context of more complex social challenges the premise is easy to understand: we have scientific and technical labs for solving our most difficult scientific and technical challenges whilst we need SLs to solve our most pressing social challenges. SLs are platforms for addressing complex social challenges that have three core characteristics (Hassan, 2014) :

- **1. They are social.** SLs start by bringing together diverse participants to work in a team that acts collectively. They are ideally drawn from different sectors of society, such as government, civil society, and the business community. The participation of diverse stakeholders beyond consultation, as opposed to teams of experts or technocrats, represents the social nature of SLs.
- **2. They are experimental.** SLs are not one-off experiences. They're ongoing and sustained efforts. The team doing the work takes an iterative approach to the challenges it wants to address, prototyping interventions and managing a portfolio of promising solutions. This

[2] https://newhorrizon.eu/
[3] http://riconfigure.eu/
[4] https://cochangeproject.eu/

reflects the experimental nature of SLs as opposed to the project-based nature of many social interventions.

- **3. They are systemic**. The ideas and initiatives developing in SLs, released as prototypes, aspire to be systemic in nature. This means trying to come up with solutions that go beyond dealing with a part of the whole or symptoms and address the root cause of why things are not working in the first place.

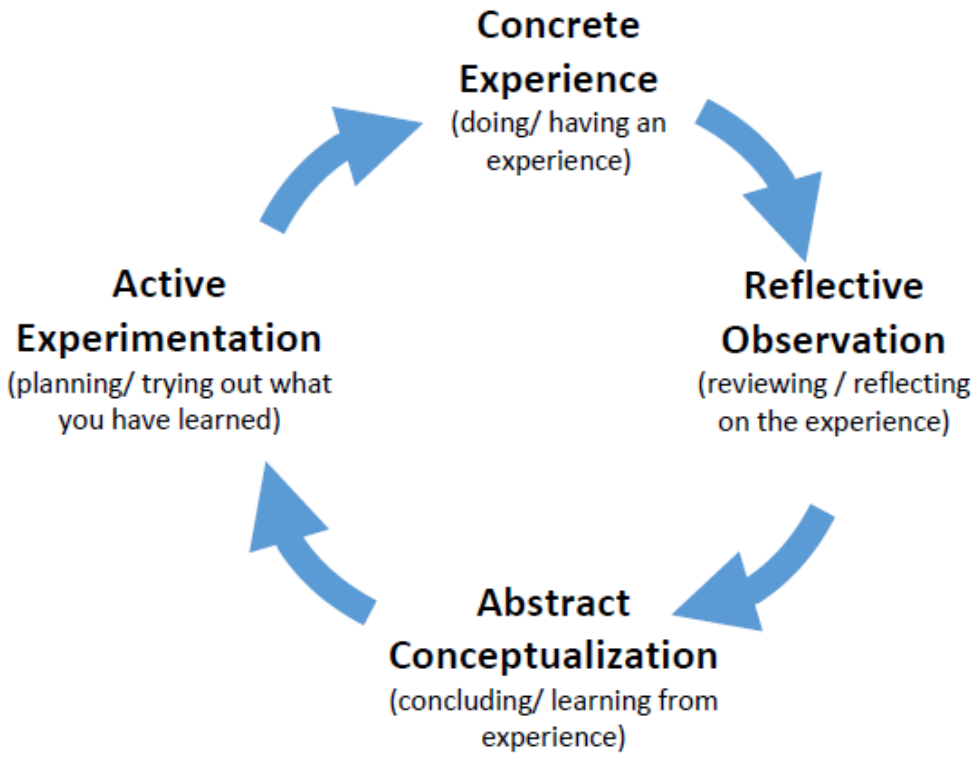

Figure 1 Learning cycle iteration of social labs. Source: (Moon, 2004)

Whilst this is an emergent phenomenon and there is no abundant literature available, a recent paper published last year also recognizes six features that SLs have (Timmermans, Blok, Braun, Wesselink, & Nielsen, 2020):

1. SLs offer a space for experimentation.
2. SLs are not closed off from the outside world, but intently are a part of the real world.
3. SLs require active participation of a wide range of societal stakeholders that are of relevance to or have an interest in the social challenge, such as policymakers, businesses, government, and civil society.
4. SLs are multi and interdisciplinary involving a wide range of expertise and backgrounds as well as approaches.
5. SLs support solutions and prototypes on a systemic level.
6. SLs have an iterative, agile approach.

As we can observe, features and characteristics embedded in SLs favour continuous iteration, flexible processes and adapting to the different needs that can emerge at different stages. At the same time, learning, skilling and empowerment of SLs participants is of critical importance during the multiple iterations and learning cycles enabled by SLs (Hassan, 2014).

4.2. What is a SocKETs Lab?

SocKETs gets inspired by SL methods implementation in previous and current Responsible Research and Innovation (RRI) projects like RRI Tools, NewHoRRIzon, RI Configure or Co-Change and SE through co-creation projects like GoNano. These initiatives have produced several guidelines and manuals that stem from empirical evidence and significant experiences in organizational change, experiential learning and active experimentation (Griessler, Hönigmayer, Braun, & Frankus, 2021; Groves, 2017; Marschalek et al., 2014; Popa, Blok, & Wesselink, 2018; Tabarés et al., 2020).
In SocKETs, we want to build up on these materials and incorporate them to our knowledge portfolio with the idea to valorise them and extending its reach and use to our labs.
We should state that SocKETs labs are inspired by SL methodology, but not limited to it. In SocKETs we will combine the methodology be for instance combining it with the ecosystem approach.
In this sense, SocKETs is creating six Labs across Europe with the aim of establishing the right conditions, resources and tools in each of them to facilitate SE **activities using co-creation tools and other participatory tools**.
The labs will pay attention to the application of a variety of KETs into different innovation ecosystems with the ambition to promote SE in these R&I contexts. These six Labs can be grouped around three specific topics that deal with different innovation domains and societal challenges:

1. **Circular economy** by design processes for the re-use and recycling of materials, toward sustainable consumption and production
2. **Electronic health** applications
3. **Industrial automation systems**, toward decent work and better industry, innovation and infrastructures

The establishment of these six labs in each of the R&I contexts will be deployed in Bulgaria, Denmark, Estonia, Italy, Serbia and Spain. They will set up a series of co-creation activities, experimenting several forms and ways of interaction between R&I stakeholders and citizens to explore priorities, expectations, and concerns on R&I in the related fields of the labs. Together, research and industry representatives and citizens will develop and co-create solutions, prototypes and alternatives that can be responsive towards societal needs and challenges.

4.3. Who are the stakeholders?

Stakeholders are societal actors that have an impact on the R&I process at hand or are impacted by the same process. They are stakeholders in as much as they have a stake in the process: a legitimate

interest, a valuable resource, a risk to tackle or the combination thereof. Stakeholders need to be aware of their stake(s) as well as their (societal) interests stemming from these stakes. During the process, stakes may change as well as their relevance and importance and their "holders". The SocKETs Lab process is also a negotiation and mediation process of such stakes and the claims arising of such stakes and the (constantly changing) hierarchies they may involve.

4.4. What are the incentives for stakeholders?

SocKETs co-creation process will consist of several workshops and further interactions at virtual environments. This will require of the participation of different stakeholders identified during the empirical fieldwork carried out in deliverable 1.1 *Report on innovation ecosystem maps for selected case studies* (Pimponi et al., 2021) as well as others that are yet to be reached during the rest of the lifespan of the project. It is important to stress that with the irruption of COVID-19 significant difficulties have been introduced for gathering physical meetings across Europe and to the date that this is being written (June 2021), there is a high uncertainty about them.

For this reason, it is of high importance to develop a value proposal highly attractive for participants in the SocKETs Labs, not only for engaging participants in physical events (that are foreseeing to be possible in the near future), but also in virtual activities (due to pandemic worsening).

Incentives for stakeholders are understood as motivations and expectations to participate in SocKETs labs activities.

Incentives for participation in participatory and virtual workshops can be grouped into extrinsic motivations and intrinsic motivations (Antikainen & Väätäjä, 2010).These two kind of primary motivations have been widely studied in the literature of user-driven innovation and crowdsourcing (Lakhani & von Hippel, 2003; Surowiecki, 2005; von Hippel, 2005). These extrinsic and intrinsic motivations to participate in open innovation platforms can be summarized in the following:

Extrinsic Motivations

- Payments
- Reputational gains and acknowledgements
- Leveraging capacity

Intrinsic motivations

- Altruism
- Sense of belonging
- Learning, skills development and knowledge exchange
- Intellectual challenges
- Fun, social networking and enjoyment

SocKETs Labs will address extrinsic and intrinsic rewards to participants. The emphasis will be made on intrinsic motivations, but also in some extrinsic motivations such as reputational gains

and leveraging capacity as it will not be possible to reward participants with any kind of payment. To this extent, the benefits associated to the participation in the Lab will be clearly and fully explained in the dedicated promotion materials and communications for potential participants.

4.5. What do societal engagement activities mean?

Participants who will take part into the six different SocKETs Labs will be engaged in SE activities. The terms SE activities, SocKETs Lab experiments or activities are commonly used, and they refer to the same kind of activities spurred by participants' ideas, collaboration and efforts to promote SE around KETs and align industry and society.

These activities will stem directly from the personal motivations, interests and willingness of participants to promote them. These SE activities can take a variety of forms such as dedicated and demanded trainings in socio-ethical aspects of innovation, workshops that promote SE around KETs, events for promoting science-society interactions into particular contexts, development and or adaptation of co-creation tools oriented to KETs development or strategies to promote institutional change in favour of SE. These are some of the examples that can be envisioned at this stage, but the development of the six labs will probably produce completely different impacts in each of the labs.

In each of the six SocKETs labs, we could have different activities and participants, but it will respond to a particular socio-ethical controversy or dilemma at stake that KETs are hinging on particular contexts.

A lab is understood as a container for testing SocKETs societal engagement process and tools around controversy, dilemmas or exploration of KETs' unknown angles. Regardless of the sector and the challenge addressed, a common SocKET engagement process will be followed. Therefore, the Exploration, Prototyping and Testing and Evaluation stages will be put into practice in all labs.

The SE activities or experiments done will help us to learn how to create a dialogue between technology and society around different dilemmas that KETs-based innovations or early developments could produce. It will also enable learning about the leverages and barriers of industry when engaging citizens different from the final users or potential customers but considering the society in a global perspective.

5. Stages of societal engagement process in SocKETs Labs

In this section, the different stages of the process that will promote SE in the different innovation ecosystems will be presented. A more detailed description and further recommendations during the operationalization of the process is available in chapter 6, but this section aims to provide an overview of the whole process. In addition, a set of templates will be initially compiled as annexes (section 8) that can be further extended on the potential needs that can arise during the development of each of the labs. SocKETs partners involved in SocKETs Labs will follow an iterative process composed by three main stages of a typical multi-actor engagement and co-creation processes: Exploration, Prototyping and Testing. Evaluation activity is also incorporated to assess the impact and suitability of the engagement activities.

While we follow these three main stages with participants of the labs to align the development of KETs-based innovations with societal values and needs, the SocKETs consortium will also follow a learning process based in three different stages: Exploration, Prototyping & Testing and Evaluation. Exploration stage has been already started throughout the case studies developed in WP1, observing and identifying opportunities to promote SE around KETs and it will mainly end after workshop 1[5]. Prototyping & Testing will occur after workshop 1 and during workshops 2 and 3 and it will be based on participants ideas for promoting SE activities around KETs. Evaluation stage will be paying attention to the evaluation of the whole process (setting up and development of SocKETs Labs) as well as their different outputs (SE activities spurred by the labs).

The **Exploration** stage consists of a co-design process where participants from industry, research, public administration and society are encouraged to be involved in the SocKETs Lab. This initial stage is aimed to promote the engagement process with selected stakeholders that have been initially identified during the previous fieldwork in WP1 (mainly through interviews), but also engaging others that have been identified as relevant through a variety of means (snowball strategy based on interviewees networks, documental analysis, relevance in social media, partner contacts, institutional references, etc.). In this sense, the mapping of the innovation ecosystem carried out in D1.1 will provide an initial snapshot of stakeholders coming from the innovation ecosystem that will be complemented during this stage. The exploration stage consists of an invitation part (invitation to stakeholders to be part of the lab) and a collective exploration of different socio-ethical issues that can be found on KETs development. Those issues are different for each lab and have been initially

[5] However, some new ideas for SE activities can be brought up by participants at later workshops and SocKETs Lab managers should be able to incorporate them.

spotted during the work carried out in D1.1. Issues such as the lack of co-creation activities or the lack of collaboration between stakeholders into particular sectors should be explored by labs for developing activities that can be later tested in the second stage.

Prototyping and Testing stage is the second step of the iterative process that needs the participants to be actively engaged in the SocKETs Lab. At this stage, participants will be encouraged to propose novel ideas for engaging citizens into KETs technological development, proposing alternative approaches to current R&I roadmaps, enabling collaborations between different stakeholders or soliciting the active collaboration of stakeholders not previously engaged in R&D&I. Workshop contents will focus on identifying barriers for collaboration, techniques to promote SE, dimensions of RRI for favouring KETs acceptance and many others. Mapped stakeholders of innovation ecosystems, as well as others that are yet to be identified, should be encouraged to develop ideas and suggestions on KET-based innovations. By working together in testing tools for engagement and co-creation, industry actors and citizens will achieve a better understanding of each other's perspectives, expectations, priorities and concerns for developing KETs and for contributing to strengthening science-society interactions in their particular contexts.

Evaluation stage will deal with the assessment of the processes enabled by the SocKETs Lab and to capture, monitor and report the different learnings, lessons and recommendations provided by participants in the lab. It will also evaluate the adequacy, suitability and performance of the co-creation tools employed during the development of the six labs. The evaluation will employ mixed methods and it will not rely on a set of particular quantitative indicators as the impact of the project is highly difficult to be measured during the lifespan of the project and with classical indicators. In this sense, a set of qualitative indicators and quantitative indicators will be balanced to monitor participants feedback and labs impact.

Figure 2 represents the stages (explore, prototype & test and evaluate) and their more visible operational aspect, that is, the workshops. During the exploration stage, among other things, a Co-design workshop should be delivered and at the prototyping and testing stage at least two interactive events will be delivered which might be named as Maturation and Celebration workshops. Depending on the circumstances and evolution of each SE activity, other workshops (physical or virtual) may be organised.

In the Maturation workshop the participants have experienced some activities and explored some challenges. Their level of involvement is medium-high and also the understanding of the SE co-creation process.

In the Celebration workshop the participants have got some results that can be evaluated. Somehow, they have gone through the co-creation process of a SE activity and they might have explored new challenges and activities to prototype and test. The participants have a better understanding of SE

activities and have the knowledge and tools to continue the process of incorporating SE in their organizations.

The main protagonists of this process are the different stakeholders of the different ecosystems, represented as the 4-helix approach. Each SE activity, as seen in D1.1, will involve the appropriate stakeholders.

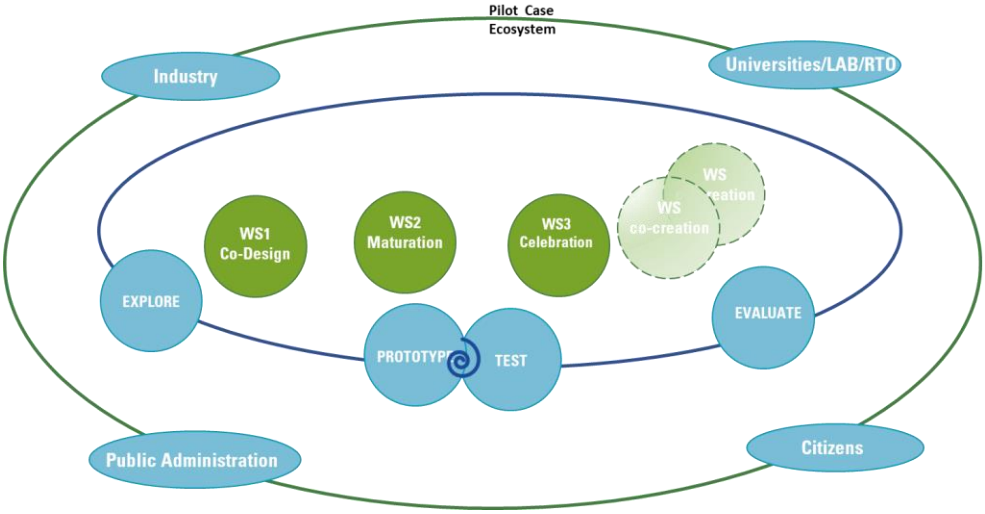

Figure 2 Process stages and workshops

5.1. Exploration: Co-designing the societal engagement process

To facilitate SE during this initial stage and during this initial stage and the lifespan of the project, it is important to understand which are the critical socio-ethical and cultural particularities for innovation that have been observed during the previous fieldwork in WP1. New particularities can also arise during this stage and in later stages (i.e. ethical dilemmas in AI implementation) and it is crucial for the SocKETs Labs' teams to be able to identify these particularities that can provide room for SE during the development of the labs. **These observations, understandings and particularities should provide enough "food for thought" to make room for society to be engaged in these processes.**

At the same time, petitions, dilemmas and controversies brought into the lab by participants should be attended too, only when these are aligned with the objectives of the lab. This is one of the most challenging aspects of the management and facilitation of the lab as this will require to choose and to assess "what is in into the lab" and "what it is out of it" (Bogner, 2012). Collective reflections should be carried out in relation to the role of society for KETs development as well as which parts of current innovation processes can favour the involvement of society and citizens.

Special attention should be also paid to innovation dilemmas and controversies detected in the mapping stage that can contribute to improve current innovation processes developed in each of the contexts where the labs will be embedded. It is also important to build from the very beginning a strategic thinking into the lab, trying to invite representatives of all societal domains that can

contribute to the development of SE activities in SockETs Labs. Anticipation, reflexivity, inclusivity, diversity, responsibility, sustainability and care are not only suitable dimensions of RRI but also aspects that have to be promoted and supported during the development of the lab. That is why it is important to imagine which kind of outputs should be desired from the lab, but also to adapt and to be flexible for helping, supporting and coaching participant´s actions to promote SE around KETs. An initial and guiding list of aspects to be considered for this stage could be:

- Desired outputs to be produced by the lab
- Selection criteria for participants
- Design incentives that can be attractive for participants
- Promoting reflection about already identified KETs-related dilemmas
- Supporting inclusivity of potential stakeholders not currently engaged in R&D
- Ensuring diversity (gender, race, cultural, geographical balance)
- Identify actions that can be continued after the lab development or escalated
- Enable personal connections that can be nurtured after the process

Regarding the temporality of this stage, it is difficult to align stages with workshops due to their radical different natures. While workshops are shaped by linearity (they are included into the workplan and their dates will be appointed into a calendar), stages are prominently defined by circularity. They can occur during workshops, between workshops and they are totally determined by the active involvement, engagement, and willingness of participants for being developed. We can estimate that the exploration stage is mainly located before and during the Design Workshop, but new KETs dilemmas or socio-ethical controversies can also be explored during the Maturation and Celebration Workshops. SocKETs Lab teams should not close the exploration stage in workshops 2 and 3 if there are strong arguments for not doing so. At the same time, it is commonly expected that exploration stage should end in workshop 1 and prototyping and testing should occur after workshop 1 and in workshops 2 and 3.

5.2. Prototyping and testing

Participants that will be engaged into the lab will be encouraged to prototype and test their ideas to promote SE around KETs. Participants at this stage will be invited to take part of the SocKETs Lab and encouraged to co-create, prototype and test ideas for innovation based on KETs, by using and testing tools and methodologies relevant to the needs and challenges previously identified in WP1. Citizens and stakeholders will be engaged to co-create with industry and technology developers throughout a variety of means and tools that will be facilitated on particular demands observed in each of the labs. Participants will promote SE activities around KETs in each of the labs with the help of SocKETs Lab team. They will select and test several co-creation tools and methodologies oriented to facilitate the development of their ideas during the workshops as well as between workshops. These co-creation tools and methodologies will be provided and facilitated by Lab managers and tailored to

participant´s needs and ideas. Several examples of these co-creation tools are listed in section 6.2 but this list will be enlarged and expanded according to participants needs in each of the labs.
In this sense, these interactions will take place during the planned workshops, but it can also happen in other related events such as trainings, events or exhibitions that will be demanded, organized or promoted by participants. Prototyping and testing new solutions to meet societal needs and demands through KETs based innovation will involve industry, research, public administration and citizen representatives whenever possible. This stage will help to crystallize ideas and solutions proposed by participants in the lab and it will help to generate collective feedback from other participants.
SocKETs toolbox will benefit from the active experimentation of participants with different co-creation tools and their performance in the six different contexts where the labs are situated. This feedback will contribute to the later development of the toolbox in WP3. An initial set of aspects to be taken into account during this stage are:

- Promote an active involvement of participants into the labs
- Identify which participants can own a SE activity or promote it
- Try to encourage all participants to contribute to SE activities from their different expertise
- Do not discard any idea at first sight and try to promote a collective assessment of them
- Promote an active follow-up of SE activities between workshops with dedicated actions
- Do not assess ideas from a fail/success perspective. Instead try to collectively envision who can benefit from that SE activity, what can bring to SE and how it can be supported by the lab participants.
- Try to adapt or use the tools that can be beneficial for SE activities
- Do not stitch to particular tools based on your personal experiences.
- Be brave and try to introduce new tools that can spur active participation
- Promote reflexivity between the research team and evaluate the risks of introducing new tools.

The prototyping and testing stage will mainly occur during Maturation and Celebration Workshops, but we cannot discard that it may happen during the Design Workshop (i.e. a participant attends to this workshop with a pre-defined and contested idea of a SE activity that wants to develop into the lab). It is also important to stress that SE activities will have completely different timings depending on the time availability of participants to work on them and the resources that will be mobilized. In this sense, SocKETs Lab team need to be flexible but at the same time, supporting, encouraging and coaching participants of the lab to carry out their ideas on KETs related SE activities.

5.3. Evaluation of the process

SocKETs Lab will monitor participants evolution in relation to their attitudes and values around SE **as well as the impacts of their SE activities.** This evaluation will include mixed methods and it will be based on a particular set of quantitative indicators (number of participants, number of organizations

involved, etc.) as well as qualitative ones. These qualitative indicators will be based on methods such as interviews, discourse analysis or collective interviews that will try to monitor participants change towards SE around KETs. Evaluation stage will pay specific attention to two different levels:

- Evaluation of the whole process (the SocKETs Labs)
- Evaluation of SE activities spurred by the labs

These two levels will comprise the different co-creation tools and methods employed, assessing the results and providing comparability between the labs. At the same time, it will allow to observe and monitor participant's experience and feedback.

Evaluation of SE for KETs

SE in complex problems such as KETs requires a different approach with regards to evaluation. Regular evaluation practices often depart from criteria or procedures determined beforehand that stem from a certain viewpoint or frame, thereby excluding other views present in the complex ecosystem. Due to the wide range of stakeholders taking part in these engagement processes, which all hold their values, views, and solutions to problems, and since different stakeholders only tend to recognize the evaluation outcomes when they sufficiently adhere to their viewpoints, a more inclusive and representative way of evaluation is needed. In addition, regular evaluation practices have the assumption that the system within which evaluation takes place is known and that the goals of engagement are clearly formulated. However, with engagement for complex problems this is often not the case. These complex problems often change and are moulded during the process and it is often not possible to set clear goals beforehand. This makes regular evaluation practices inherently difficult and requires a different approach (Folkert, Verwoerd & Verwest, 2018).
Therefore, to successfully evaluate the engagement practices in WP2, we intend to facilitate a reflexive evaluation process. The reflexive learning approach combines both regular evaluation methods, which evaluate whether procedures have met their intended goals (justification), and responsive evaluation methods, which are rather focussed on facilitating 'learning' (Folkert et al., 2018).

Evaluation stage will monitor participants feedback and labs impact. This stage will take place after the completion of the three workshops and after the whole process ending. However, some participants can leave SocKETs Lab before the third workshop or maybe they cannot attend to the Celebration Workshop due to agenda constraints. It is important to mention that feedback from these participants should also be taken into account despite they won´t be able to reach the formal destination which is the last workshop. More details will be available at D1.4 about the process of evaluation by VU partner. At the time that this text is being written this deliverable is on the making and it will be produced during August 2021 by VU.

6. Considerations for SocKETs Labs Societal Engagement activities

6.1. Roles and tasks

Different roles are needed in a SL to be executed. Taking a look at New HoRRIzon SL manual we find some of these profiles listed as SL managers, SL manager assistants and facilitators among others (Griessler et al., 2021). In this section, the aim is not to be comprehensive but to stress the need of defining from the very beginning who does what in the lab. That is why we focus in four roles that are critical for the development of the lab:

- **SocKETs Lab Manager** leads the lab. He/she invites participants, designs and coordinates activities for the workshops, and/or in between workshops, and is in charge of logistics (rooms, caterings, etc.). He/she has profound RRI knowledge and identifies and stimulates discussion around KETs dilemmas and controversies. The SL Manager is the responsible of the design and content of the lab.
- **SocKETs Lab Manager assistant** provides support to the SL Manager in their duties and tasks. SL assistant can also provide support to facilitators if needed (i.e. diverse or big groups that demand micro-facilitation). Assistants will help to SL managers to design and feed templates and harvesting data through the whole development of the lab.
- **Facilitator** provides facilitation and dynamization into the workshops. The role of the facilitator is critical for the development of the workshops and it demands a lot of energy and planning for successful events. He/she is familiarized with co-creation activities, dynamics and experiential learning and has specific facilitation skills such as listening, positive accepting and/or dealing with resistance. The facilitator is responsible for managing workshops but not for its content, therefore, SL manager and facilitator cannot be the same person.
- **Participants** are invited to be part of the lab on the findings obtained in WP1 as well as during the exploration stage (see section 5.1). "They are the blood of the SL" and they will be the main recipients of workshop contents. They can attend to all workshops (ideal scenario) or to some of them (non-ideal scenario). They will spur SE activities.

Despite some of these roles can be combined into single persons or merged into research team members, it is highly recommended that these roles will be taken up by separate individuals, not overburdening and overloading project team members. These roles will be also illustrated with specific examples of other projects during the case clinics that will be developed before the Design Workshop.

6.2. List of tools and materials

The development of the SocKETs Lab will provide enough room for experimentation and co-creation between different stakeholders that will take part into the lab. It will also provide the opportunity to test and to evaluate different co-creation tools that will also feed the toolbox that will be deployed in WP3. To test particular tools is not the major objective of SocKETs Lab but it will be the main place where different tools will be employed when co-design and co-creation activities take place. These tools will be put into practice by different stakeholders coming from industry, research, public administration and/or citizens organizations. The collaborations between stakeholders coming from different backgrounds will demand particular tools at different stages of these collaborations and it is important to gather a particular portfolio or collection of tools that can be selected upon practical needs. Despite the aim of this section is not to compile an exhaustive list of tools. We list some co-creation tools with a description to provide some examples that can be of help to the SocKETs Lab team members.

Case clinics

Case clinics are used to access the wisdom and experience of peers and to help a member of the group see new ways of responding to a leadership challenge that matters deeply to that person. Case clinics are often used during the prototyping phase of a process. Case Clinics guide a team or a group of peers through a process in which a case presenter presents a case, and a group of 3-4 peers or team members help as consultants. Case Clinics can take place online or in person (where physical distancing measures can be respected) and allow participants to generate new ways to approach a challenge or question.

Uses & Outcomes

- Concrete and innovative ideas for how to respond to a pressing leadership challenge
- High level of trust and positive energy among the peer group
- Use with: Mindfulness and listening practices

For further information see https://www.presencing.org/

Building prototypes

The purpose of building prototypes is to create a microcosm that allows you to explore the future by doing. Prototypes work on the principle of "failing early to learn quickly". Prototyping moves an idea or innovation into a concrete next step. Prototyping translates an idea or a concept into concrete action. Prototypes are an early draft of what the final result might look like which means that they often go through several iterations based on the feedback generated from stakeholders. Prototypes are normally used together with methods for collaborative ideation and for understanding and analysing complex problems in an iterative learning co-creation process, as the Design Thinking methodology developed by IDEO company.

Uses & Outcomes

- Prototypes translate an idea into a concrete first step. This step is not meant to be the final product, but it allows you to generate valuable feedback from stakeholders. This feedback is then the basis for refining the concept and its underlying assumptions.
- A prototype is a practical and tested mini version of what later could become a pilot project that can be shared and eventually scaled.

For further information see https://www.presencing.org/ and https://designthinking.ideo.com/

World Café

The World Café is a powerful social technology for engaging people in conversations that matter, offering an effective antidote to the fast-paced fragmentation and lack of connection in today's world. It can be considered as a method, a process, or technique, based on conversation and dialogue, that facilitates turning individual intelligence into collective one. World Café got its name because it imitates a café setting where small groups (4 or 5 people) are all conversing together around tables. In this case, a cluster of small groups – anywhere from 10 to 1000 – are in conversation about an issue that matters to them or some work they are trying to do together. It is an ideal way to find out what a community is thinking and feeling about a topic. After the first conversation, someone stays at the table as 'host', while the others move to a new table, taking their previous conversations with them. In this way, the threads of the various conversations are woven together and all of us get a sense of what is being discovered and developed between us.

Uses & Outcomes

The World Café process is particularly useful:

- When you want to generate input, share knowledge, stimulate innovative thinking, and explore action possibilities around real life issues and questions
- To engage people--whether they are meeting for the first time or they are in established relationships--in authentic conversation. An authentic conversation is one in which a person has a simple, honest and real conversation.
- To conduct in-depth exploration of key strategic challenges or opportunities
- To deepen relationships and mutual ownership of outcomes in an existing group

For further information see http://www.theworldcafe.com/

Pro Action Cafe

The Pro Action Cafe is a space for creative and action-oriented conversation where participants are invited to bring their call - project - ideas - questions or whatever they feel called by and need help to manifest in the world. The concept of Pro Action Cafe is a blend of "world cafe" and "open space" technologies. It was first conceived by Rainer von Leoprechting and Ria Baeck in Brussels, Belgium. As a conversational process, the Pro Action Cafe is a collective, innovative methodology for hosting conversations about calls, questions, and projects that matter to the people that attend. These

conversations link and build on each other as people move between cafe tables, cross-pollinate ideas and offer each other new insights into the questions or issues that are most important in their life, work, organization, or community. As in Open Space Technology, topics are brought forward by participants themselves. There is no set agenda, only overall guiding questions, with the intention of deepening the learning process of all participants. As in a World Café, it can evoke and make visible the collective intelligence of any group, thus increasing people's capacity for effective action in pursuit of common aims. This means that during this event we participate in different topics of conversation.

Uses & Outcomes

Pro Action Café can be used with an open invitation to a broad number of people and/or as a methodology for a specific group, organization, or community to engage in creative and inspirational conversation. In this way it is a good tool for convergence and getting into actions.

For further information see https://www.artofhosting.org/

Other tools to be considered

As the purpose of this section is not compiling an extensive list of resources, other resources that can be interesting for SocKET Labs team members:

- Designing for Values Tool https://www.rri-prisma.eu/rri-tool/designing-for-values/
- New HoRRIzon Societal Readiness Level Thinking Tool https://newhorrizon.eu/societal-readiness-level-thinking-tool/
- COMPASS Self-Check Tool https://innovation-compass.eu/self-check/
- SDG Impact Assessment Tool https://sdgimpactassessmenttool.org/
- Embedded ethicist https://www.rri-prisma.eu/rri-tool/embedded-ethicist/
- RRI Tools Self-Reflection Tool: https://rri-tools.eu/self-reflection-tool
- Action Catalogue: http://actioncatalogue.eu/search

For providing a categorization of tools we also compile several tools into a table that includes a short description, expected outcomes and the level of engagement promoted by these tools. These are only suggestion of tools and depending on the needs of the lab, different tools that are possibly not included here can also be used.

METHODS	LEVEL OF ENGAGEMENT	DESCRIPTION	EXPECTED OUTCOMES
Conferences and presentations with selected stakeholders	Inform Involve	A formal meeting of people with a shared interest in which experts provide information to a specific target (even large) audience	Stimulate dialogue
Focus groups	Consult Involve	Discussion in a small (4–12 members) group of stakeholders facilitated by a skilled moderator	Obtain a range of insights (people's attitudes, beliefs, desires, reactions) in a relaxed, non-threatening environment

Workshops	Consult Involve Collaborate	Single, short event designned to introduce or teach participants practical skills, techniques, or ideas that they can then use in their work or their daily lives. Generally small groups, allowing everyone some personal attention and the chance to be heard	Obtain feedback from participants Collect opinions, values, needs, concerns about the topic and related issues Generate new ideas and ways to improve the material introduced
World café	Consult Involve Collaborate	Discussion in few small groups and multiple rounds. Host introduces the process and the "Café etiquette" After the first round, people are free to change tables for the next round Each round starts with a question designed for the specific context and purpose At the end, individual group results are shared in a plenary discussion	Generate new ideas, joint decision-making, key strategic issues, new ways for collaboration, etc. Reflect on implications of a complex issue Identify specific steps for further exploration and implementation Create a graphic recording of people's ideas and expressions in words, images, and colours to be shared as a framework or guide
Fishbowl exercise	Involve Collaborate	Form of dialog to discuss specific topics in large groups. A few chairs are arranged in an inner circle (the fishbowl), and a few participants are selected to start the conversation, sitting in the fishbowl, while the others are sitting outside (all around) The moderator introduces the topic, and those in the fishbowl discuss it, while those outside listen Anyone is allowed to join the conversation by occupying an empty chair in the fishbowl or tapping the shoulder of the person (not talking) they want to replace At the end, the moderator closes the fishbowl and summarizes the discussion	Collect opinions, values, needs, concerns about the topic and related issues Reflect on implications about a complex issue Generate new ideas, joint decision-making, key strategic issues, new ways for collaboration, etc.
Co-creation/co-design	Involve Collaborate Consult Share	Joint creation and evolution of value with stakeholders that is intensified and enacted through platforms of engagement or crowdsourcing To be successful, the process needs to be transparent and stakeholders need to have access to the company data on the co-creation topic	Share specific and detailed information to allow a proactive creation Identify values, needs, concerns, etc. Generate new concepts and ideas Joint value creation based on stakeholders' experiences Collect, share, and spread ideas (e.g., design, functionality) Unexplored ideas emerge because of open conversations Improves costs and increases diversity
One-to-one interview	Involve Consult	The list of issues to be addressed or questions to be asked can be presented in a structured or semi-structured way	Collection of detailed information on a specific matter or sets of issues.

Surveys	Consult	Data collection on a specific topic(s). Predominantly, data is collected by self-completion questionnaires or by (semi-) structured interviews	Collection of a data set that allows the identification of patterns of relationships between the topics

Figure 3 Methods for stakeholder management

6.3. Implementing the process

During the development of the SocKETs Lab, three workshops (minimum) will be carried out into the six SocKETs Labs (Design, Maturation and Celebration). Each workshop is planned to last between 0,5 and 1,5 day(s), each lab planning the duration in flexible ways to adapt to workshop purpose and lab members availability. Workshops will comprise different kind of contents, talks, dynamics and activities towards the engagement of a variety of KETs stakeholders. These workshops will constitute different momentums (Design, Maturation and Celebration) for the SocKETs Lab. The workshops will be distributed into a period of time that comprises 9- 12 months and workshops will occur every several agreed months of separation. The balance between synchronicity and flexibility between the labs will be pursued (agreed dates between labs for hosting the workshops but with flexibility). The workshops are the core of the SocKETs Lab, but other activities and events can happen during the development of the lab. These activities will be agreed upon the needs of participants of the lab and the interest and willingness of participants to be involve in.

There is no defined number of participants, but it would be advised to have 12 to 20 people as it is a good indicative and manageable group of people (excluding SocKETs Lab team members). Some participants can attend to all events while others can attend to some. In this sense, it is important to identify which participants are "deeply engaged" with the aim of the lab and which others are not. These highly motivated participants can also recruit or recommend other colleagues to take part in the lab as well as increasing the impact of SocKETs Lab activities. These participants are highly valuable as they will constitute the core of the lab. At the same time, it is also so important to make an initial and accurate recruitment of participants, trying to retain these ones during the whole process and starting with new recruiting measures if needed (if already recruited participants do not attend to next workshops). Participants will also have to sign informed consent forms (ICFs) as their data will be gathered throughout a variety of means (registrations, testimonies, templates, surveys, etc.). Social lab managers use the SocKETs Informed consent forms translated from English and collected as an annex to the Data Management Plan. The forms will be adjusted from interview to workshops.

Regarding the physical locations where the workshops can be held, a space that can be open, modular and adapted to the different needs is recommended. It is also important to check that the rooms have different facilities such as whiteboards, screens, flip charts, round tables, not fixed chairs, etc., that can determine the development of the event and the things that can be done in the space.

Workshops can be located in different cities or places where the stakeholders are located but try to think in their perspective and provide a manageable and easy to reach place (not long trips, public transport availability, etc.)

Design Workshop

The first workshop is the "Design Workshop" which aims to trigger the co-creation activities into the six SocKETs Labs. Based on the findings produced by previous WP1 and deliverables, SocKETs team lab members will present the diagnosis of innovation ecosystems and will collectively identify activities with participants that can promote SE around KETs. A more detailed and collaborative design of this workshop will be developed and agreed with partners involved during the very beginning of fall 2021. The main objective of this first workshop is to stimulate participants, promoting reflexivity about their work with KETs and orienting them to generate ideas that can promote SE around KETs.

The workshop will also demand the development of several materials such as a flyer, an invitation letter, ICFs and an evaluation survey (to be developed in liaison with VU). Evaluation of the workshop will be done through quantitative and qualitative methods.

What happens between first and second workshop?

After the first workshop, it is important that SocKETs team lab members can gather an internal meeting to reflect and to discuss what went well and what did not go well. It is also very important to report (SL manager duty) what happened into the lab collectively trying to provide an accurate picture (a template will be delivered by TECNALIA team). A summarized or public version of this report will be shared with participants for giving the opportunity to provide feedback and maintaining communication.

SocKETs Lab team members and "active participants" already identified in the first workshop that want to promote SE activities will have to continue working in the development of activities already identified during the workshop. These activities can manifest into a variety of forms such as the organization of dedicated trainings, public engagement activities, guest talks, development of documents, etc. In this sense, it is important that SL managers collect first ideas of activities to be developed and report them back to participants for adding their inputs after the workshop. Exchanges between workshops can happen either in virtual ways or face-to-face meetings and upon COVID-19 restrictions or relaxation measures.

Maturation workshop

The second workshop of the SocKETs Labs aims to dig into co-creation activities, engaging citizens and stakeholders for developing a set of products and design solutions that can promote KET-based innovations. In this second workshop, a maturation momentum will be achieved into the lab as different ideas and activities will have more development and time. Participants will be continuously

encouraged to work on their design and development and contents of the workshop will pivot around the needs raised by participants of the first workshop regarding RRI, co-creation tools, sustainability, etc.

The workshop will demand also the development of several materials as it in the first workshop and an evaluation survey (to be developed in liaison with VU). Evaluation of the workshop will be done through quantitative and qualitative methods.

What happens between second and third workshop?

As well as between first and second workshops, it is important that SocKETs team lab members can gather an internal meeting to reflect and to discuss what went well and what did not go well after second workshop. It is also very important to report (SL manager duty) what happened into the lab collectively trying to provide an accurate picture (a template will be delivered by TECNALIA team). A summarized or public version of this report will be shared with participants for giving the opportunity to provide feedback and maintaining communication.

SocKETs Lab team members and "active participants" will continue working in activities and ideas raised during the first workshop as well as new ones that can appear during the second workshop. At this point of the process, it is important to not duplicate efforts and trying to group and to look for synergies between participants of the lab that are promoting similar activities. Exchanges between workshops can happen either in virtual ways or face-to-face meetings and upon COVID-19 restrictions or relaxation measures.

Celebration workshop

Third and final workshop will put an end to the SocKETs Lab development. This can be named also as "Celebration Workshop", as it will provide collective assessment and recognition for the activities spurred into the labs by participants. Contents of this third workshop will also pay significant attention to the sustainability dimension of the activities carried out and to recapping the main lessons of the whole experience. Participants will be encouraged also to work on next steps after the end of the lab. Evaluation of the workshop will be done through quantitative and qualitative methods.

What happens after the third workshop?

SocKETs team lab members will gather an internal meeting to reflect and to discuss about this last workshop but also about the whole experience itself. SL manager duty will report about this workshop and the whole process (a template will be delivered by TECNALIA team). A summarized or public version of this report will be shared with participants for giving the opportunity to provide feedback and maintaining communication afterwards.

6.4. Cross fertilization and mutual learning

Mutual learning, sharing information and exchanging best practices between the different labs developed by the SocKETs project will demand coordination and communication between labs. In this sense, the TECNALIA team in coordination with other partners involved will establish a forum where SL managers, assistants, facilitators and researchers can actively discuss, share and debate about the progress made in their own labs. This process will be coordinated by TECNALIA as coordinator of WP2 and it will start with the development of the case clinics before the formal setting up of the lab. It will continue through the whole SocKETs Lab development and it will consist of several virtual and/or physical meetings whenever possible due to COVID-19 restrictions relaxations measures.

The first step for this cross-fertilization and mutual learning processes will be done throughout a comparative assessment. This initial comparison will be delivered into a template where different features of them such as the context where is embedded, the drivers and barriers that are faced, practical needs, etc will be filled in. A table of example is provided into the annexes (annex 8.6) that can be used for triggering these collective encounters, providing comparisons and facilitating synergies between labs.

The six SocKETs Labs will have a monthly (tentative but it can be modified upon collective agreement) meeting for exchanging information, sharing best practices and contributing to establish a community of practice (Wenger, 1998) around the labs. The forum can have a coaching circle-like approach where the different lab representatives shares their insights that could resonate in other lab members. The group can collectively benefit from these exchanges for exploring common concerns, barriers or challenges envisioned. These monthly meetings can have a duration of 60/90 minutes, promoting a prior reflection about what is the situation into the lab and what are the next steps. Each lab will have its own slot to express their main particularities and problems at stake. Some guiding questions that can be used for this exercise are:

- What went well?
- What went not so well?
- What I've learnt about the process, tools…or other aspects depending the stage of the process?
- What will be put into practice during next times?

After individual contributions a group debate can be orchestrated for collective assessment and feedback to particular problems, needs or orientations. The aim is that all labs will have multiple and diverse contributions from other labs. A second part of these forums can be also focused into concrete needs that demand particular attention and project management efforts, practical technicalities, logistics, etc. Besides the forum, bilateral meetings for peer-to-peer learning can be promoted for promoting already identified synergies (topics, dynamics or others) and to co-create

and escalate collective actions between labs. Physical meetings between labs could also facilitate this scale up and it will be pursued during the lifespan of the lab.

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8. Annexes

The following annexes present some examples of templates used in other projects that might be of inspiration and that could be adapted to the particular needs of SocKETs Lab during the online training.

8.1. Invitation letter to SocKETs Lab

The following letter of invitation to participate in the SocKETs Lab is taken as example from New HoRRIzon[6], and it will need to be adapted to our specific purpose.

This invitation together with project information should be sent to each potential participant, that has shown an interest in the project. It is recommended, that a potential participant in the Sockets labs has received the 8.2 flyer beforehand.

Dear [title, surname]

The Project "SOCIETAL ENGAGEMENT WITH KEY ENABLING TECHNOLOGIES (SocKETs)" sets out to enable industry to engage with citizens on developing Key Enabling Technologies (KETs) that consider societal priorities, expectations and concerns. SocKETs will eventually develop a digital free and easy-to-use toolbox, that enable KETs to be developed in dialogue with citizens and society.

[Name of your institution] is happy to invite you to become a part of this European endeavour, funded by the European Commission's Horizon 2020 Framework Programme under Grant Agreement Number 958277.

To foster Societal Engagement activities in KETs-based innovations we are setting up the so-called SocKETs Labs in in six different countries bringing together researchers (including social science and humanities), with industry, manufacturers, professional users and citizens to analyse: 1) the potential and challenges for KETs to contribute to solving societal challenges, 2) the participatory tools and methodologies available for industry to collaborate with citizens and other societal stakeholders, and 3) priorities of citizens and societal stakeholders for KETs.

[6] https://newhorrizon.eu/

Here you describe the process of the Sockets labs, as agreed upon in the online training, with a special focus on this, the first lab.

The first of three SocKETs Lab workshops will be held in [place/venue] on [date], from [hour] to [hour], with different important stakeholder groups. Our purpose is to share experiences on Societal engagement and to identify promising practices, constraints and needs from all the stakeholder groups involved to develop pilots based on it.

Your experience will be essential contribution for the SocKETs Lab operations and further on the project, where you will have the opportunity to convey the concerns and expectations of your field of expertise. We sincerely hope that you will be able to accept this invitation. The project will cover your travel and accommodation expenses and provide you with more information before the event.

Would you kindly confirm your participation by [date], to [name], at [e-mail].
In case you will not be able to join us, we would be grateful if you could suggest any colleague who might be interested in attending the workshop.

Yours sincerely, [Signature], [(Title) Name Surname], [Institution, Department], [E-mail], [Telephone], [Address]

8.2. Contents for an enticing document (The Sockets Lab needs you!)

The contents presented here are general, as they are not referred to a specific type of stakeholder nor to a specific SocKETs Lab. They need to be adapted in each case to the specific purpose and receiver. It is meant as a 'one-pager' that creates a quick overview of what a potential participant in a Sockets lab gain from participating, and what we expect of the participant.

What can the Sockets Living Labs do for you?

From September 2021 to July 2022, six Sockets Living Labs will take place in six countries across Europe. Each lab will focus on one of three different fields: eHealth, circular economy or industrial automation systems.

Each lab will work with existing product development ideas and processes, and combine them with societal engagement methods from other fields, to create new and innovative ways of designing products based on emerging technologies.

To make this possible, we need companies like yours to participate in the labs.

From participating you will get:

- Working experience with the free to use, online toolbox designed and developed based on the experiences from the Sockets Labs
- Involvement in a learning process, that your company is free to adapt and use
- Promotion of your products and ideas in a living exhibition hosted in Science Museums all over Europe through the network of EU Science museums, reaching thousands of citizens
- Possibilities for networking and being part of an interregional community of actors from your value chain that will help promote innovations in your specific sector

What can you do for the Sockets Living Labs?

Just like the output from the Sockets Living Labs are free for the participants, so are participating in the labs. But to make them work, it is important that you as a participant take time between the scheduled workshops to implement in your company, what you have been working on in the workshop.

If you sign up, it is important that you participate in as many of the activities as possible.

During the Sockets Living Labs you will be expected to participate in:

- An initial design workshop, where you can help shape the SocKETs Lab in order to address the most important issues related to innovation in your sector
- 2-3 co-creation events, with a focus on mutual learning, deliberating and knowledge sharing with area specific stakeholders and citizens
- Follow-up (mainly virtual) activities to analyze in depth specific innovations or issues of interest emerged during the co-creation events

Before and during the labs, you will have the opportunity to

- Form the work of the labs, by preparing a specific product development case from your company
- Invite other relevant stakeholders from your network to participate in the labs
- Become a testimonial of technical innovation, by sharing your innovations and ideas with others through interviews and video
- Contribute with specific products or ideas in the design phase of a living exhibition

8.3. Workshop One Design Template

The SocKETs Lab will start with the first Workshop in each region. The aim of this first design workshop is to start the co-creation of some engagement experiments with the participants coming from different areas of the regional innovation ecosystem. The agenda for this first workshop will be

open in the sense that will be co-created by the participants, but the preparation and facilitation is very important to create a good atmosphere, and to establish the process and the resources needed to fulfil the purpose of the workshop.

We can envision the following three steps in the agenda of an initial workshop of 0,5-1,5 days duration: first, Introduction and Orientation, second, Exploring the Challenge, and third Creating Common Ground and Designing Experiments.
Starting from a diagnosis and common understanding of potential challenges that can be addressed in this process to align societal needs with KETs-based innovations, participants will generate ideas about experiments or pilot activities of citizen engagement. From these possible experiments they will select two or three to be designed, prototyped, and tested during the lifetime of the SocKETs Lab. Several participants will adopt an engagement activity they are particularly interested in and committed to as sponsors. That means they will strive to embed it within their organisation. After the workshop, sponsors and SocKETs Lab leader will continue to design the pilot and seek to forge alliances within the sponsor organisations to test it.
This table can be used as a template to start designing the Agenda of the First Design Workshop:

Time	What	Objective and How
1. Introduction and Orientation		
	Welcome & Introduction	The purpose in this first part is to foster curiosity and create a good working atmosphere.
	Warm-up	The participants can tune into the topic, the agenda of the workshop and get to know each other.
	Societal engagement	
	SocKETs Lab	
	Sharing experience and views	participants dive into the topic, sharing experiences and views and work on it.
2.Exploring the Challenge		
	Dialogue and co-creation	Participants start working, envisioning potential challenges
3.Creating Common Ground and Designing Experiments		
	Dialogue and co-creation	Detailing the experiments Selection of experiments Use of co-creation tools
	Wrap-up and next steps	

We recommend the use of the following checklist for preparing the workshop, developed in the project LIVIN[7].

Checklist for running a SE workshop

A successful workshop is based on good preparation. This checklist will help you keep the most important points in mind and set up a successful process. On the day of the workshop itself, good facilitation and a motivated organizational team can help to deal with minor changes and unforeseen changes.

Setting up the Workshop

- The purpose of the workshop is clear
- We have an exact timeline
- We know who we want to involve in the workshop
- Our invitation strategy is clear
- A reward for the participants is set up
- A participant information sheet is written
- The decision-making scope is defined
- The expected results are clear and we know what to do with them afterwards
- The workshop plan is developed, taking into consideration:
- Audience
- Workshop objectives
- Constraints and strategy for overcoming constraints
- Materials needed
- Consent procedures

At least two months before the workshop

- Invitations of participants with all information they require are sent
- Facilitator is found
- The venue and catering are booked

Two weeks before the workshop

- Dates, times, travel information, etc. with the participants are confirmed
- Dates with the venue are confirmed
- The materials for the workshop are assorted
- The workshop is communicated with the facilitator

[7] https://www.living-innovation.net/

8.4. Workshop Two Design Template

The SocKETs Lab will continue with the second Workshop or maturation Workshop in each region. The aim of this second workshop is Evaluate activities done so far and harvest lessons learned; Deeping the knowledge of SE and its dimensions; and Continue work on existing experiments and create and plan new ones.

The following agenda inspired in a New HoRRIzon project workshop can be used as inspirational example to start designing the Agenda of a generic Second Workshop:

Nr.	What	How
1	What is the purpose of this 2nd workshop of this lab?	Input by SL manager or SL facilitator
2	How much do I care about Societal Engagement (SE) now? What is my ambition regarding SE?	First in groups of two then in plenary
3	Per pilot action: - What does the pilot action look like now as compared to at the 1st workshop? - What is the SE issue at stake? - Which barriers and which enablers to SE did/does it address? - Which organisations and actors were/are involved and why? - What was frustrating / inspiring? - What are our insights? - What are our questions?	Working on the 7 questions separately in the pilot actions groups and then presenting in plenary Newcomers join one of the pilot actions groups to listen and learn
4a	"Playful task" per pilot action: Show a scene from your story that conveys either your frustration or your inspiration	Prepare separately in the pilot actions groups Newcomers join one of the pilot actions groups to participate
4b	Each pilot actions group shows prepared scene	At the end of each scene a designated "stage director and assistant" give advice for next scene
5	Addressing the questions raised in 3) Creating a time structure first	Questions with limited interest are discussed in parallel small groups. Questions with interest by most participants are discussed in plenary via a variety of input, dialogue or fishbowl
6	Personal decisions concerning pilot actions: Continue (love it) – Modify (change it) – Leave it – Create a new pilot action	Time for individual decisions first in silence and then made visible in plenary

7	Detailing until 3rd workshop per pilot action: a) What is our shared intention and aspiration? b) What is the name of our pilot action? c) Which aspects of the visions and of current reality do we address? d) Who is pilot action owner/driver, who is co-driver, and who is part of the team? e) What support do we need from SL Manager? f) What are the initial and next actions?	Prepare the answers to all six questions separately in the pilot actions groups on flipcharts and then presenting in plenary
8	Reflection on 2nd workshop: - What was inspiring and engaging for me? - What are my thoughts and feelings about fulfilling the purpose of the lab?	First individually on pin cards (for documentation) and then sharing in plenary

8.5. Workshop Three Design Template

In the third workshop SocKETs Lab participants would evaluate the engagement experiments. They would adapt these activities after considering their own experiences, as well as the feedback from SocKETs Lab participants.

As the third workshop focuses on reviewing and reflecting participant's experiences with the activities, then the following group of people should be invited:

- SocKETs Lab Participants who engaged themselves in one of the experiments.
- People who were not present in the 1st and/or 2nd workshop as participants but has been involved in the activities as addressee of the activity or has played an active role in the experiment in one way or another.

The four Phases of the Third SocKETs Lab Workshop

We propose to help participants to actually make a difference to the typical presentation of a success story – the listing of the "what" in general terms. Find playful ways to ask for and inspire genuine stories that include the laborious processes of inventing new modes of "how" plus experiences of the more challenging aspects of emerging concerns, dilemmas, constraints, delays, tensions, and difficulties.

The phases can be the basis of a more detailed agenda adapted to the specific needs of each SockETs Lab:

	What	How
1	Reflective Observation	Reviewing and reflecting on the pilot action experience
2	Abstract Conceptualization as Narratives	Making sense of what happened by adding order and plot to what he or she experienced
3	Future	How may the Narratives suggest appropriate repertoires for future Societal Engagement action?
4	Cheerful Conclusion	What did I/ enjoy most about the Social Lab process as a whole and about the other pilot actions?

8.6. Workshop registration form

The following content can be adapted to be used for participants' registration for a workshop/event considering GDPR requirements:

Dear participant

To organize this meeting/workshop/event/activity/webinar, we will collect information about your: [Fill in the data you will collect- Name, email, age, gender, geographical zone, level of education and occupation (etc.)]

We will collect the following data, to [fill in why you are collecting the data]
This data will be [fill in how the data will be handled and used ex. Anonymized after the event and used for an analysis in a public report] your contributions to the analysis will (not be shared with others / be shared with other organizations in the project / be anonymized and shared with others / published on the website or in a report / be shared with the client).

Information with personal data used to organize the meetings will be kept until all meetings have been completed, except for the sign-up sheet (and other data necessary for financial reporting), which will be kept for [X] years after the project is completed ([enter year]). Then it will be demolished.

The meeting/workshop/event is organized by [name of responsible person], [organization], (possibly on behalf of [project name or other organization]). The data protection officer for the event is [name and email of DPO from the responsible organization].

☐ *I have understood the terms and would like to participate.*

You can withdraw your consent to participate at any time and request that your data be deleted by contacting [responsible project manager + email].

However, you cannot withdraw contributions when they are anonymized, just as you cannot withdraw data after the meeting/workshop/event, as it according to law or contract must be used for financial reporting.

You can read more about the workshop here [LINK], and the project here [LINK]

You may be photographed/filmed/recorded during this meeting/workshop/event/activity/webinar. In order for [Fill in organization or project] to use the photos/recordings of you to disseminate, you must sign a consent form. The photos/recordings may be used in both printed and digital form, in various channels. The images/recordings will be used for a maximum of X years.
If you want us to stop using photos/recordings of you in new material, we ask you to contact the [name of organization]. We will then no longer use your personal data in new information material. We will also remove you from already published material wherever possible.

☐ *I give (Name of organization or project) my consent to use pictures and videos of me for dissemination activities of the meeting/workshop/event/activity/webinar*

8.7. Lab table needs

The following table will be used to facilitate a comparative assessment during the cross-fertilization and mutual learning processes among the six SocKETs Labs, as explained in section 6.4 of this manual. The table will register features of the Labs such as the context where is embedded, the drivers and barriers that face, practical needs, etc. For instance, practical needs in terms of training in co-creation tools that can arise in a particular lab, challenges related to cultural particularities of participants of a particular KET, etc. This table will be a living document that will accompany the labs for promoting reflection about the factors that are shaping the lab. It can be used for triggering these collective encounters, providing comparisons and facilitating synergies between labs.

Organization	Name	Context	Societal engagement rationale	Drivers / challenges	Practical needs	What does societal engagement mean to you?	Areas of collaboration

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