



Deliverable D4.1

Methodology Citizen Panels

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1. Introduction: objectives and content of D4.1

Engagement is considered to be one of the central pillars of responsible research and innovation (RRI) by the European Commission (see e.g. European Commission 2016) and by most of the academic literature on RRI. Burget, Bardone and Pedaste conclude their recent review of RRI literature by stating:

“In the light of the discussion on definitions and conceptual dimensions, it can be argued that RRI is essentially an attempt to govern research and innovation in order to include all the stakeholders and the public in the early stages of research and development. The inclusion of different actors and the public is, in turn, meant to increase the possibilities to anticipate and discern how research and innovation can or may benefit society as well as prevent any negative consequences from happening” (Burget, Bardone, Pedaste 2016: 15).

On one hand, engagement of stakeholders and the general public into research and innovation builds on existing experiences with participatory and deliberative approaches in other fields as, for example, planning and other policy issues on the local level (e.g. Goede 2013). These approaches are increasingly transferred to the realm of R&I (see e.g. PE2020 Amodio et al. 2015). On the other hand, new and innovative forms of engagement in R&I such as citizen science, community research, living labs, and participatory budgeting are symptoms of the ongoing transformations of the relation of science and society (see e.g. Irwin 2008; Owen, Macnaghten, Stilgoe 2012). How the inclusion and engagement of stakeholders and the general public in the new multi-actor networks characteristic of new modes of R&I (e.g. Irwin 2008) can be effectively realized, and how this engagement can fulfill its expected effects, still poses considerable challenges and unsolved issues. These include, for instance, the factors that influence the willingness (e.g. Castell et al. 2014; Sturgis 2014) and capacities (e.g. Rowe et al. 2010; Lidskog 2008) of these new actors to contribute and take over a certain (co-) responsibility in R&I.

The PROSO project aims at advancing insights into factors, which influence the engagement of two types of societal actors, namely third sector organizations (TSOs) and non-organized citizens. WP4 deals with the engagement of the latter. In contrast to the persons, who will be interviewed as members of third sector organizations (in WP3), the participants in the national citizen panels will not be recruited as representatives of particular organized interests, but as individuals who are members of a polity. The search for innovative forms of governing science, technology and innovation (STI) includes a trend to give citizens a say with regard to the development of STI, a key notion here is that of “technological citizenship” (Frankenfeld 1992). When investigating citizens’ views of such new “rights” (complementing civil, political, and social rights), it is important to not (fully) abandon the “expert-laypeople divide” as Lidskog’s statement shows:

“... to label citizens as lay people is still relevant in a very important sense: in contrast to others involved in knowledge production and risk management, citizens are not professionally active. It is not their professional task to take part in public meetings, contest knowledge claims, evaluate different proposals, and elaborate standpoints. Instead they have to reallocate leisure time to take part in knowledge production. Simply put, public inclusion is a time-consuming activity, and even in cases where the citizens are economically compensated for their involvement, they still participate at the expense of their leisure time or time at their workplace” (Lidskog 2008: 83).

The overall objective of WP4 is first, to generate insights into barriers and incentives for citizens to engage with R&I. More specifically, we research the factors and conditions that from the perspective of the citizens themselves enable and constrain their engagement into (responsible) research and innovation. The second objective is to then contribute to developing policy options and practices to promote citizen engagement for RRI.

To achieve these research objectives, we will carry out citizen panels in five European countries: Austria, Bulgaria, Germany, United Kingdom, and Portugal. We will elicit the perspectives of citizens in regard to how they see their (possible) roles in R&I and contributions to RRI, and what, from their viewpoints, could and should be done to lower existing barriers and to strengthen incentives for their participation. The present deliverable (D4.1) sets out the detailed methodology for these national citizen panels. The overall methodology is inspired by the three-step design of the CIVISTI¹ method (see e.g. Jacobi, Klüver, Rask 2010), and will combine two rounds of citizen panel meetings with an expert workshop in between.

In this deliverable, we begin by defining the focus of the national PROSO citizen panels as well as relevant conceptual elements (chapter 2). Then, we detail the three-step design for the citizen panels (chapter 3), which includes:

- First meeting of the citizen panels (3.2).
- Joint expert workshop (3.3).
- Second meeting of the same citizen panels (3.4).

Finally, we summarize the expected results and their linkages to other PROSO activities (Chapter 4).

2. Focus and concepts

In this chapter, we briefly summarize the current state of knowledge on enabling and constraining conditions for citizens to engage in research and innovation (2.1), specify the focus and the central concepts of our study (2.2), and formulate the questions guiding our research (2.3).

¹ CIVISTI stands for Citizen Visions on Science, Technology, and Innovation.

2.1 Enabling and constraining conditions for citizens to engage in R&I

Currently, various public engagement approaches are developed, tested and promoted in the realm of research and innovation, such as through EU funded research projects like [Engage2020](#), [PE2020](#), [SYNERGENE](#) and [NERRI](#). These engagement approaches cover a large variety of methodologies and formats, which attribute different roles and tasks to citizens, by integrating these at different places into the complex webs of multi -actor networks of R&I. One central question that is insufficiently studied is whether and under what conditions citizens actually *want* to be engaged into R&I. Sturgis has pointed to this research gap by stating:

“[...] we know rather little about whether the public are as keen on participatory dialogue as those who advocate it as key to democratic governance.” (Sturgis 2014: 40).

This reflects a concern that Rowe and colleagues had already raised in 2010:

“There are a number of fundamental questions, however, that the literature largely fails to answer, namely do the public have interest and capacity to be involved in this domain, and how should one enact that involvement?” (Rowe et al. 2010: 236).

Also, in terms of the legitimacy of engagement processes, a “fundamental problem of scale” (Lövbrand et al. 2011: 483, quoted by Stilgoe, Lock, Wilsdon 2014: 5) has been identified:

“[...] processes seem legitimate only for the people who are involved in them. For those interested in broader questions of science and democracy, this would seem to be a fundamental problem, unless we take a wider view of the governance experiment of which engagement is a part” (Stilgoe, Lock, Wilsdon 2014: 5).

Hence, there is also lack of knowledge about the views of citizens *not* taking part in these engagement processes (cf. e.g. Wilkinson, Dawson, Bultitude 2012: 57). PROSO seeks to contribute to addressing these open and highly relevant research questions.

Quantitative survey studies give us some information about the general attitudes and willingness of European citizens in relation to engagement with research and innovation. In the Eurobarometer survey, one third of the respondents (EU 27) agreed that the public should be consulted and public opinion considered when making decisions about science and technology (European Commission 2010).² The PAS 2014 survey (Public attitudes on science, Castell et al. 2016) found the following

² European Commission (2010: 86) (Eurobarometer QC4 “Which of the following public involvement do you think is appropriate when it comes to decisions about science and technology?); „ [...] Europeans most feel that decisions about science and technology should be made by scientists, engineers and politicians, and the public should be informed about these decisions (36%) and secondly, that the public should be consulted and public opinion should only be considered when making decisions about science and technology (29%).“ 14% of the respondents even opted for “Public opinion should be binding when

results for the UK – which needs to be seen against the increasing institutionalization of public engagement with science and technology in the UK – namely that:

“People overwhelmingly think regulators, governments and scientists should be engaging in dialogue with the public about science. While this does not always translate into a willingness to be personally involved, there are still three-in-ten who would at least like to have more of a say on science issues” (Castell et al. 2016: 91).³

Castell and colleagues furthermore found that it is most challenging to involve two types of people: women, who often feel less confident in engaging with science, and the less affluent:

“While the less affluent are typically the strongest advocates for involving the public, they tend to be among the most cynical about public consultation, and among the least likely to want to get involved themselves” (Castell et al. 2016: 8).⁴

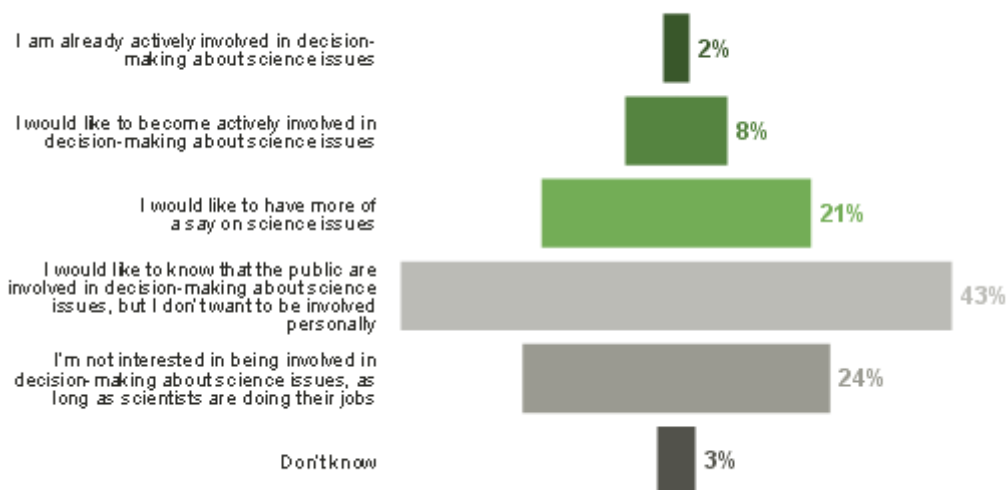
To further explore this apparent gap between the prevailing view that citizens should be involved in R&I – and the rather low willingness of citizens to get involved themselves, is one of the central interests of this study.

Research already has revealed the role of certain conditions that enable or constrain citizens’ engagement in R&I. Qualitative research points out that central barriers for citizens are the **time** and **effort** they need to invest when they engage, especially, when they need to take over **unusual roles** and **tasks** (cf. e.g. Lidskog 2008: 83, see citation above).

making decisions about science and technology.” And only 7% chose: “The public does not need to be involved in decisions about science and technology.”

³ Source: PAS 2014, see Castell et al. (2016: 93):

Q. Which of these statements, if any, comes closest to your own attitude to decision-making about science issues?



Base: 1,749 UK adults aged 16+

⁴ Our recruitment strategy for the citizen panels is to include both women and the less affluent, so that we will be able to learn more about the views of these two groups of citizens.

Castell and colleagues (2016: 15 ff.) identified **different types of general attitudes** towards engagement: the Confident Engagers, the Distrustful Engagers, the Late Adopters, the Concerned, the Indifferent and the Disengaged Skeptics. In contrast, research on engagement in the context of the energy transformation in Germany (project [KomMA-P](#)) has distinguished two types of general attitudes towards engagement, the managerial type, who conceives policy making as an efficient management of public affairs and the deliberative type, who has (direct-)democratic ideals. The authors argue that engagement formats need to be adapted to the diverging goals of these groups of people.⁵ Overall, the relation between people's general attitudes towards engagement and what specifically constrains or incentivises different groups to engage, still remains underexplored.

While research on engagement incentives still seems to be in its infancy, there are a several factors that are assigned a certain role as engagement incentives. These are internal motivations such as **concern**, which can be personal concern or perceived relevance for society (Wilkinson, Dawson and Bultitude 2013); the expected **impact** or specific expected policy outcomes, or external motivations like monetary **compensations** (cf. e.g. Kleinmann, Delboerne and Anderson 2009; Slegers et al. 2015).⁶ Further research on participants' perspectives on engagement has pointed at the importance of the **emotional** and **social** aspects (see e.g. Davis 2014, Jensen and Buckley 2012). Furthermore, social, political and cultural **contexts** of engagement play a role. This begins with the level of trust in the initiators of the engagement (e.g. Slegers et al. 2015) and touches further aspects of "established practices, roles, cultural ideologies and available repertoires" (Krabbenborg and Mulder 2015: 474) which can constrain or support citizens' engagement in research and innovation.

2.2 Focus and central concepts

In PROSO we seek to address the identified research gaps with regard to enabling and constraining factors of citizen engagement in (responsible) research and innovation. Our analytical focus is on the question of how different *depths of engagement* and specific *contexts* of engagement influence the motivation and willingness of citizens⁷ to engage with research and innovation. We aim to understand, what factors related to the depth of engagement and to specific contexts are perceived as constraining and enabling conditions.

Depth of engagement in our conceptual design comprises several dimensions. The depth of engagement corresponds to different *intensities of interaction* between citizens and researchers. Jellema and Mulder (2015) distinguish, from the perspective of the researcher, between discussing, consulting, involving, collaborating with and supporting the public. In a comparable approach, the

⁵ For more information, see URL: <http://www.energiewende-akzeptanz.de/ergebnisse/>

⁶ For research on incentives regarding *online* engagement, see e.g. Nov, Arazy, and Anderson 2011, 2014.

⁷ Our study in WP4 focuses on non-organized citizens, considered lay people in the sense of Liskog (2008) and we focus on adults only.

[PE2020](#) project distinguishes different *categories* of public engagement, namely public information, public activism, public consultation, public deliberation and public participation (Amodio et al. 2015). Engagement in the strict sense (see e.g. Engage 2020) is characterized by *two-way-communication*, whereas more traditional informational and educational formats may rather use one-way communication. Different depths of engagement correspond to different understandings of the relation of science and society, the so called *science-society model*. Irwin (2008) distinguishes between first, second and third order models of science public relations. By adapting a formulation by Schuurman (2009) from the living lab research community, one could roughly distinguish science *for* society, science *with* society and science *by* society to characterize these models.

The depth of engagement is not identical with but related to different *methods* and methodologies (see e.g. the [Action Catalogue](#) of the Engage2020 project). Different depths of engagement foresee different *tasks* and *roles* for citizens, such as gathering vs. analyzing data (cf. Engage2020), to be informed, to learn, to contribute perceptions, attitudes and values, to assess and prioritize, to articulate needs, to initiate or steer R&I agendas, programmes or projects, or to allocate funding. Different depths of engagement are also linked to different *requirements* in terms of resources (temporal, cognitive, educational and others), and in terms of willingness to invest these resources.

Among the various **contexts of engagement**, we focus on the life-world relation of R&I domains and issues; and on the ‘engagement cultures’ of different countries and domains of R&I.

- a) **The domains of R&I and their life-world relation** are considered relevant contexts of engagement. In the PROSO project, we focus on three domains of R&I, namely bio-economy, nanotechnology, food and health. Each domain covers multiple sub-domains and issues with various characteristics that could influence the responses of citizens in various ways. We will analyze, how citizens respond to fictitious invitations to become involved in the research and innovation process. Each group will focus on engagement examples from one sub-domain of each of the broad R&I domains, with the sub-domains varying in the degree of *life-world relation*. Life-world relation of R&I can be understood as the closeness to daily life and be defined by the intuitive meaningfulness and potential for sense making of R&I issues (see e.g. Habermas 1981). In addition, a domain of R&I has a strong life-world relation, when it is an issue of public or even private discourse, when it is dealt with by the mass media or even discussed among family, friends and colleagues. Furthermore, in the PROSO analysis, life-world relation is linked to the stages of development of technological applications, namely if these are only future options, planned, experimental or already marketed applications.
- b) We treat different **engagement cultures**, institutions and traditions in different domains of R&I and in different countries as possible factors influencing citizens’ views on engagement in R&I. Both, countries and domains of R&I, seem to have their individual cultures, traditions

and institutions of engagement. These cultures manifest in different ranges of experience with citizen engagement in R&I. Ultimately, the engagement culture is linked to the broader political, social and cultural backgrounds of the different countries and research domains.

2.3 Research questions

Our basic assumption is that citizens' motivations to engage – or not to engage – with R&I as well as their perceptions of enabling and constraining conditions of citizen engagement, vary with the depths of engagement and the different contexts of engagement that we differentiate. The aim of this empirical study is to generate insights into the validity of this assumption. The PROSO national citizen panels are designed to deal with the following research questions:

- 1) How do citizens perceive and assess their (possible) engagement with R&I and their potential roles, tasks and contributions to RRI?
- 2) Under what conditions are citizens willing, feel able, and perhaps even responsible to be engaged with research and innovation themselves – and under what conditions do they not? (enabling and constraining conditions)
 - What role do different depths of engagement play in formulating these perceptions and assessments?
 - What role do the following contexts of engagement play in formulating these perceptions and assessments?
 - a) Life-world relation of R&I domains.
 - b) Engagement cultures of different countries and in different domains of R&I.
- 3) From the perspective of the citizens, what could and should be done to lower existing barriers and to strengthen incentives to promote their engagement with R&I?

3. Detailed design of the citizen panels

In this chapter we will begin with an overview of the three-step design of the PROSO citizen panel methodology (3.1). Then, we will describe in detail the individual steps:

- The first meeting of the citizen panels (3.2).
- The expert workshop synthesizing the outcomes of the panels' first meeting and providing input into the second meeting of the panels (3.3).
- The second meeting of the same citizen panels (3.4).

For each step we will set out objectives, expected results, the participant sampling, as well as design and procedures.

3.1 Overview of the design

We will carry out citizen panels in five European countries (Austria, Bulgaria, Germany, United Kingdom, Portugal)⁸ to generate insights into the views and perspectives of non-organized citizens of their (possible) roles in R&I and contributions to RRI, and what could or should be done to facilitate their engagement in R&I.

The overall methodology of the PROSO citizen panels is inspired by the three-step design of the CIVISTI method (see e.g. Jacobi, Klüver, Rask 2010), which combines two rounds of citizen panel meetings with an expert workshop in between. While the procedural design is similar – the process of citizen dialogues in PROSO is supported by the analytical capacity of experts and stakeholders, as was the citizen participation process in CIVISTI – the research objective is different. The CIVISTI project uncovered European citizens' visions of the future and transformed these into relevant long-term science, technology and innovation issues. The PROSO project aims to uncover citizens' views of citizen engagement in R&I as information for developing governance of engagement policies and practices that can better meet citizens' perspectives and (possible) desires in being engaged in R&I.

Our methodological approach is qualitative and explorative. To a certain degree, it is pre-structured and guided. [Table 1](#) gives an overview of the three-step design, including the interim activities and (interim) products.

⁸ This sampling is basically justified by the location of the PROSO partners, covering Central Europe as well as Eastern and Southern Europe. This sampling includes countries with older (e.g. United Kingdom) and more recent (e.g. Bulgaria) experiences with citizen engagement in R&I.

Table 1: PROSO citizen panels - overview of the three phases, *interim activities* and ➔ *(interim) products*

Event(s)	Content	Methods of data collection and analysis	Time	Date
Citizen panels first meeting (AT, BG, DE, UK, PT)	Citizens share and exchange their views on different depths of citizen engagement in R&I related to the domains of bio-economy, nanotechnology and food & health.	3 parallel focus groups plus plenary sessions	ca. 6h	Sept. 2016
<i>Desk research</i>	<i>PROSO partners distil patterns of enabling and constraining conditions of citizen engagement (incentives and barriers):</i> ➔ Drafts of the national reports of the citizen panels, summarizing results in each country	<i>Content analysis, interpretation & synthesis</i>	<i>Ca. 1,5 months</i>	<i>Autumn 2016</i>
Expert work-shop (Sofia, BR)	1. Experts synthesize and reflect on barriers and incentives across countries 2. Experts develop and structure policy options to address the identified barriers, strengthen identified incentives, and promote engagement.	Clustering and understanding incentives and barriers Brainstorming and structuring policy options.	2 days	Dec. 2016
<i>Desk research</i>	<i>PROSO partners prepare experts' results for citizens' feedback.</i>		<i>1 month</i>	<i>Jan. 2017</i>
Citizen panels second meeting (AT, BG, DE, UK, PT)	1. Citizens validate and amend experts' synthesis of barriers and incentives 2. Citizens discuss and prioritize policy options ➔ D 4.2 National reports citizen panels.	(Deliberative) validation workshop, world café elements and voting are planned	ca. 4h	Feb. 2017
<i>Desk research</i>	➔ D 4.3 Synthesis report citizen panels.	Documentation and synthesis.		May 2017

3.2 First meeting of the citizen panels: “Eliciting European citizen responses to invitations for engaging in R&I”

3.2.1 Objectives and expected results

The aim of the first citizen panel meetings is to learn from citizens in five countries, what they think about citizen engagement in R&I, whether they are or would be willing to be engaged with research and innovation themselves, and what the respective reasons are in relation to the different engagement opportunities that will be presented.

The central objective of the citizen panels is to stimulate group discussions on a set of different engagement opportunities (presented to the citizens through fictitious invitation letters). Through these group discussions, we will obtain rich and detailed qualitative data on the citizens' perspectives on enabling and constraining conditions of citizen engagement in R&I. After the meetings, the PROSO partners carrying out the citizen panels in each country will analyze the group discussions of their national panels and condense the main results into draft national reports. The analysis will focus on

citizens' motivations to engage or not with (the governance of) public research and innovation, and on how these views and motivations relate to different depths of citizen engagement. The draft national reports will be presented, reflected on and refined in the second phase of the design, namely during the expert workshop.

3.2.2 *Sampling*

In each of the five countries, the aim is to have panels of $n = 21$ citizens. The sampling strategy is to achieve a good level of diversity of participants, and to recruit citizens that are not professionally involved with RRI, with public engagement, or with research and innovation in the domains of food and health, nanotechnology and bio-economy that will be subject of the engagement opportunities. Each country sample will strive for an equal distribution of the following categories:

- Gender
- Age (18-25, 25-35, 35-50, 50-60, 60-75)⁹
- Level of education (low, middle and high levels)
- Occupation (diverse, also including unemployed people)

Further categories are considered only, if they are theoretically relevant: For instance, citizens from different areas of residence (rural vs. urban); citizens from different parts of the country (if financially feasible), as well as citizens of different religions and ethnicities. Each country team will consider what other categories might be relevant with regard to the diversity of perspectives in their country. The sampling is carried out individually for each country and will be supported by subcontracted recruitment companies

3.2.3 *Design of the information input*

In order to elicit the citizens' perspectives on citizen engagement, citizens will be asked to respond to fictitious invitation letters describing different depths of engagement, namely **science café**, **citizen dialogue** and **participatory budgeting**. These invitation letters will be related to specific sub-domains of R&I, namely **CRISPR/CAS – gene editing** (bio-economy); **nanotechnology to monitor and clean up the environment** (nanotechnology), and **sweeteners to promote good health** (food and health).

⁹ The plan is to divide the citizens into five groups, which, broadly speaking, represent people in different stages of their life and professional experience, namely: young adults between 18-25 (mostly students), young adults around 25-35 (mostly young professionals), people with more extensive working experience (35-50 years old), people in the later years of their professional life (above 50) and people at the end of their professional life/pensioners – from 60 to around 75 years old). We intend to have a sample of three to four citizens per age group. Adaptations to these age groups are possible and encouraged, if deemed relevant by partners so that as diverse a set of participants as possible is achieved (e.g. if the minimum age for retirement in a country diverges). However, all country samples must have **at least 1/3 of the participants below the age of 35**.

These sub-domains will be described to the citizens in the form of vignettes and are further specified in Annex A. The design of the information input is explained in detail in the following, a detailed summary is given by Table 3.

Overall approach

The overall approach to information input and stimulus provision is to vary a selected set of factors that we are especially interested in as possible constraining and enabling conditions of citizen engagement. We also keep at some factors consistent, which are not in the main focus of our attention. It is clear, however, that citizen views and motivations will be influenced by a whole range of factors that cannot be fully considered in the stimulus design. The citizens will be invited to discuss their possible engagement in relation to three different depths of citizen engagement (variants A, B, and C) and regarding three different R&I domains, each of these represented by one R&I sub-domain (sub-domains 1, 2, and 3), see Table 2.¹⁰

Table 2: Basic scheme for the selection of sub-domains and the creation of variants for the citizen panels

R&I domain	Sub-domains	Depths of engagement		
		Depth A	Depth B	Depth C
Bio-economy	Sub-domain 1	1A	1B	1C
Nanotechnology	Sub-domain 2	2A	2B	2C
Food and health	Sub-domain 3	3A	3B	3C

Criteria

We have selected three sub-domains and created three fictitious engagement events of different depths by using the following criteria:

- They need to be describable in a form that is **understandable** for a 10th grader at high school (ca. 15 years old).
- *Sub-domains* need to demonstrate a difference in the degree to which they relate to the **life-world** of citizens: Selected sub-domains relate to applications at different stages of development, and have been, to varying degrees, the subject of existing debates in private, public and political arenas.¹¹

¹⁰ Each of the PROSO R&I domains is too broad to be entirely covered by one sub-domain. The selected sub-domains are representative examples only.

¹¹ We acknowledge that the life-world relation of sub-domains remains highly *subjective*, strongly depending from a persons' background and interests. Therefore, we need to validate our assessment of life-world relation of the selected sub-domains, either through a pre-test with citizens and/or through systematically asking the citizen panellists about their assessments (at the occasion of the first meeting of the citizen panel and with the help of a short questionnaire, for instance). The ascription of the life-world relations to domains of R&I relates to the *selected sub-domain* only. We do *not* claim, for instance, that all sub-domains from the domain of bio-economy have a weak life-world relation and that all sub-domains from the domain of food and health have a strong life-world relation.

- The sub-domain from *bio economy* should have a rather weak life-world relation, which means that the R&I sub-domain is far removed from realistic applications and that citizens likely have not previously heard about the topic.
- The sub-domain from *nanotechnology* should present a medium life-world relation, which means that the R&I sub-domain already has some concrete applications that have been realized and citizens may have heard about the sub-domain, but likely have not had private discussions about the topic yet.
- The issue from the *food and health* should have a strong life-world relation and concern for the citizens, meaning that applications are on the market already and that people may already have discussed the topic in their daily lives.
- The sub-domains can be **plausibly linked** to the three different depths of engagement.
- The central criterion to create the *depths of engagement* (A, B and C) is that they are clearly **distinct** and **cover a large range of depths of engagement**.¹² They need to differ with regard to the following dimensions:
 - The **category** of engagement (see PE2020).
 - The **intensity** of interaction between citizens and researchers (see Engage2020).
 - The **method** of engagement.
 - The **tasks** and the **roles** for the citizens.

Other conditions are kept *constant*, as all depths of engagement are:

- Forms of **offline** engagement (vs. online engagement).
- Forms of **invited** engagement (vs. uninvited engagement).
- More **cognitive-communicative** types of engagement (vs. emotional-artistic and/or entertaining ones as science theatre, dance, installations or gaming).
- Initiated by **public** actors.

Conditions, such as the requirements of **time**, the **sampling** of the citizens (self sampling vs. systematic selection), the (monetary) **compensation**, the **potential impact on R&I decisions** regarding different **stages of the research cycle**,¹³ as well as the concrete **initiating actors** are adapted to the different depths – if necessary to design meaningful and credible formats of engagement – but they are not in our research focus.

¹² To maximise the range of depths of engagement, we will include one variant of engagement that puts the *information* of citizens in the foreground (one-way communication) and thus only represents a very weak form of engagement.

¹³ Different *stages of the research cycle* are: formation of research policy or agenda setting, the definition of research programs, the project design and the concrete implementation of a project (see Engage2020, Jellema and Mulder 2015).

To be clear, this is *not* an experimental setting, but a *qualitative* and *explorative* design. Instead of testing the impact of individual variables, we will consider and communicatively explore the influence of the different factors and conditions during the group discussions, by asking probing questions that will help us to fully understand citizens' responses. These questions will be guided by our research focus and central concepts (see chapter 2) and the facilitators and analysts will be sensitized through the criteria and conditions listed in this sub-section.

Empirical basis

In order to find suitable sub-domains and to construct distinct depths of engagement, we have combined three strategies: first, we scrutinized citizen engagement cases, which were part of the outcome of the WP3 literature review and case selection (see Milestone 3) for suitability for WP4 research purposes. Second, PROSO partners with specific expertise in each of the PROSO R&I domains (bio-economy, nanotechnology, food and health) were asked to specify R&I sub-domains in these three domains, which meet the identified selection criteria. Third, we scanned the [Action Catalogue](#) from the Engage2020 project and the [Catalogue of PE initiatives](#) from the PE2020 project (Amodio et al. 2015) for suitable formats and empirical examples of their application.

Vignettes and invitation letters

Vignettes will be used to describe the R&I sub-domains and provide information for the citizens.

“A vignette is a focused description of a series of events taken to be representative, typical or emblematic in the case you are doing. It has a narrative, story like structure that preserves chronological flow and that normally is limited to a brief time span, one or a few key actors, to a bounded space, or all three” (Miles and Huberman 1994: 81).

In the methodology described in the present deliverable, a vignette will be a very short (1/2 page maximum) narrative that is concrete and accessible. It will describe a R&I sub-domain by outlining what it is concerned with and provide concrete examples of (existing or future, considered, planned or realized) applications, and outline the level of surrounding debate(s).

The three (fictitious) engagement events are presented to the citizens via **invitation letters**. These will be formulated like invitation letters to real engagement processes. In order to not overburden the citizens, the letters will be short. However, they will briefly describe the context of the engagement process and its objectives and will focus on the contributions required from the citizens and the way in which these will be used; see [Table 3](#).

The information input and stimuli, consisting of vignettes and invitation letters, will essentially be the same for the citizen panels in each of the five countries. However, the invitation letters will be adapted to the specific (cultural and institutional) contexts of the countries, for instance regarding

the governmental organization and national research funding organization who are said to initiate the engagement processes.

Detailed overview of the selected depths of engagement and sub-domains of R&I

Table 3: Detailed overview of depths of engagement and sub-domains to be discussed during the PROSO citizen panels

	Depth A	Depth B	Depth C
Science-society model (Irwin 2008)	science for society ("first order model of science-public relation")	science with society ("second order model of science-public relation")	science by society ("third order model of science-public relation")
Intensities of interaction between researchers and citizens (Engage 2020, Jellema/Mulder 2015)	Informing/ education (no engagement in the stricter sense of the term)	Consulting	Collaborating
Categorization (PE2020, Amodio et al. 2015)	Public communication	Public consultation/ deliberation	Public participation
Method	Science café	Citizen Dialogue (expert input plus deliberative dialogue among citizens and with experts)	Participatory budgeting
Empirical examples for the methods	<i>Cambridge science cafés</i> <i>Science cafés during Cheltenham science festival, Edinburgh science festival</i>	<i>Citizens Dialogue on future technologies</i> <i>NanoDialogue</i> <i>BBSRCC Bioenergy Dialogue</i> <i>Public dialogue food system challenges"</i>	<i>Participatory budgeting</i> ¹⁴ <i>Experimental design by Rowe et al. 2010</i>
Main task for the citizens	"Come and talk with scientists, learn about their latest research, ask them questions and discuss with them"	"We want to learn about your views, wishes and concerns regarding the topic. This will help us to orient our future research programs at the citizens' needs and concerns."	"Assess research proposals with regard to their relevance for society – and allocate budgets to them. This helps us to fund research that is tailored to the citizens' priorities, needs and concerns."
(Potential) impact on R&I decisions on different stages of the research cycle (Engage2020, Jellema/Mulder 2015)	(Potential) impact on: design and implementation of projects	(Potential) impact on: formation of research policy; preparation of research programs	(Potential) impact on: definition of research programs and design of projects) ¹⁵
Required time	2 hours	1 day (at least)	Over two years, meeting regularly for a day every 6 months.

¹⁴ Examples of the use of the method listed in the Engage2020 action catalogue:
Participatory budgeting in Porto Alegre, Brazil;
Participatory Budgeting in Berlin-Lichtenberg (<https://www.buergerhaushaltlichtenberg.de/>);
You Say, We Pay!" (<http://www.stockport.gov.uk/services/communitypeopleliving/yourcommunity/communityandneighbourhood/neighbourhoodmanagement/central/centrallyousaywepay>);

¹⁵ In this form of engagement, the citizens do not have the final say on the effective budgeting, but science foundations have to publicly justify their decisions with reference to the citizens assessments.

			Depth A	Depth B	Depth C
Initiating actor ¹⁶ (all public)			For example: Science museum, or university	For example: National Ministry of Research	For example: National science foundation (like DFG, NSF etc.)
Selection of citizens			Self selection	Systematic sampling	Systematic sampling
Monetary compensation			No	Yes	Yes
<div>Synthetic biology</div> <div>Weak life-world relation</div>	Sub-domain “CRISPR/CA S: Gene editing” (in agriculture, industry and/or medicine)		<i>Empirical examples:</i> http://www.cheltenhamfestivals.com/science/whats-on/2016/gene-editing-risks-and-rewards/	<i>Empirical examples:</i> <i>Synthetic Biology Dialogue</i> http://www.bbsrc.ac.uk/engagement/dialogue/activities/synthetic-biology/ <i>BBSRCC Bioenergy Dialogue</i>	<i>Empirical examples:</i> None
	Sub-domain “Nanotechnology to monitor and clean up the environment”		<i>Empirical examples:</i> <i>Cambridge science cafés</i> http://www.cafescientifique.org/index.php?option=com_content&view=article&id=91&Itemid=435	<i>Empirical examples:</i> <i>NanoDiode</i> http://www.nanodiode.eu/wp-content/uploads/2016/03/NanoDiode_factsheet_3.pdf	<i>Empirical examples:</i> None
	Sub-domain “Sweeteners to promote good health”		<i>Empirical examples:</i> <i>Edinburgh science festival:</i> https://issuu.com/edscifest/docs/2016_programme_master_smallest/1	<i>Empirical examples:</i> <i>Public dialogue food system challenges</i> http://www.sciencewise-erc.org.uk/cms/uk-food-system-challenges-and-the-role-of-innovative-production-technologies-and-other-approaches-in-meeting-these/ http://www.sciencewise-erc.org.uk/cms/assets/Uploads/SWisefoodsystemCSV3.pdf	<i>Empirical examples:</i> <i>Experiment by Rowe et al. 2010 on –project proposals on diet and health issues submitted to BBSRCC</i>

For further information on the selected sub-domains, please see Annex A. The description of the sub-domains will be further refined during the writing of the vignettes in the next weeks.

3.2.4 Design of the process

Table 4 describes the planned design of the process of the citizen panels’ first meeting in the five countries. The citizen panel meetings are scheduled for late **September 2016** and will take

¹⁶

These actors may be adapted to the different country contexts.

approximately six hours. The plan is to carry them out during weekends in order to increase the potential availability of citizens. Each PROSO country team will set their own date.

Prior to the citizen panels, an **information package** will be sent to the citizens, including brief information on the PROSO project, on its concern with citizen engagement in research and innovation and on the methodology of the citizen panels.

To reduce complexity for the citizens during the citizen panel meeting, citizens will be split up into three small groups. Each discussion group will work like a **focus group** and deal with **one R&I sub-domain only**.

The citizen panels will be facilitated by the PROSO partners responsible for carrying out the panels in their countries and, if possible, other PROSO partners. Each panel requires a main facilitator for the plenary as well as three facilitators and three note-takers for the break-out groups. Audio recording of the citizen panels is optional and can be individually decided by the country partners. The facilitators of the focus groups will be trained in advance by PROSO partner ARC FUND (the WP4 leader) who will also distribute **guiding questions** for the group discussions to the facilitators. This will contribute to assuring comparability of the group discussions across the five countries. The guiding questions will have a high degree of openness to minimize the risk that facilitation overly dominates the citizen discussions.

The structure of the first citizen panel is characterized by alternating phases of plenary and small group work. The introductory plenary session will introduce PROSO, present the tasks and procedures for the day and explain citizen engagement in R&I.

Participants are then divided into three break-out groups. Partners will compose these groups beforehand assign citizens to them during their arrival and registration. Each group will operate similar to a focus group, beginning with a warm up exercise, for instance, by asking participants to mention any prior experience with engagement in R&I. Then, the sub-domain that the group will be concerned with is introduced with the help of the vignette, and first reactions by the citizens are recorded, as for instance the citizens' perceptions of the relevance, life-world relation or concern of the sub-domain. Next, the three variants of engagement are presented consecutively with the help of the short invitation letters and are discussed separately.¹⁷ Room should be given also to the comparison of the different formats.

After the group-working phase, the citizens' central views and perspectives on the different depths of engagement are reported back to the plenary. The main facilitator gives a summary of the day and

¹⁷ To avoid effects through the order of the three stimuli (e.g. from low to higher depths of engagement), we may rotate the order of the three depths of engagement in the different national panels.

an outlook on further steps of the process and in regard to the second meeting of the citizen panels. For more detail, see table [Table 4](#).

Table 4: Process scheme for the first meeting of the citizen panels; design variants are marked in orange type.

Format	Content	Duration
Plenary	Introduction: Main Facilitator: Welcome (5min) Introduction to PROSO, the issues of „Citizen engagement in R&I” (15 min) Three step methodology and programme of the day; tasks for the working groups, citizens’ roles and contributions (10min) Option: Citizens present themselves (if time doesn’t allow it – then only in their groups) (15 min) (Split into three working groups, each dealing with only one R&I sub-domain as prepared during citizen arrival and registration.	45 min
3 parallel working groups, each with a facilitator and a note-taker from the national partner, audio recording optional	Warm up: learning about the citizens motivations and expectations regarding <i>our</i> citizen panel Option: tap into prior experiences of citizens with invited and uninvited forms of engagement in R&I. Task: TBD	15 min
	Introduction to ‘their’ sub-domain of R&I with the help of the vignette, First reactions by the citizens.	15 min
	Depth of engagement A ¹⁸ : Discussing citizen views on science cafés in their sub-domain of R&I with the help of the first invitation letter Tasks: TBD	1h
	*** Break & lunch buffet ****	40 min
	Depth of engagement B: Discussing citizen views on citizen dialogues in their sub-domain of R&I with the help of the second invitation letter, including comparisons to depth A, the science café. Tasks: TBD	45 min
	Depth of engagement C: Discussing citizens’ views on participatory budgeting in their sub-domain of R&I with the help of the third invitation letter, including comparisons to depth A, the science cafe and depth B, the citizen dialogue. Tasks: TBD	45 min
	Optional: Comparisons of the three forms of engagement	30 min
	Coffee and return to the plenary	15 min
Plenary	Presentation of central perspectives and assessments of the citizens regarding the three cases of engagement (10 minutes each group, by the group facilitators plus citizens) Main facilitator: Brief summary of similarities and differences in the citizen perspectives regarding the three cases. Closure: Further steps: expert workshop and second meeting of the citizen panels, thank you.	1h15 min

¹⁸ The order of depths of engagement to be discussed may rotate, see footnote 17.

3.3 Expert workshop: “Understanding the patterns of enabling and constraining conditions and preparing policy options”

3.3.1 Objectives and expected results

The first objective of the expert workshop is to synthesize, reflect upon and understand the citizens' views and perspectives *across* countries. Drafts of the national reports on barriers and incentives, summarizing the patterns of the output of the individual national panel meetings, are the foundation of this second step of the citizen panel process. The patterns and explanations found in the different countries are compared and discussed by the experts.

The second objective of the expert workshop is to identify possible policy and practice options to address the identified barriers and incentives and promote engagement of citizens in R&I.

First, we expect to gain knowledge about **barriers** and **incentives** of citizen engagement in R&I from the citizens' perspective, including an understanding of the role of the different depths of engagement, the (potential) role of country contexts and the (potential) role of different characteristics of domains of R&I in relation to the perception of these barriers and incentives. These results will be prepared (in form of hypotheses) to be fed back to the citizens. Second, we expect to obtain a list of different types of policy and practice options to be presented to the citizens during the second citizen panel meetings.

3.3.2 Sampling

The expert workshop will bring together **n= 13-20 internal and external experts**.

- **Internal experts:** PROSO team members, including those representatives from the five country teams, who can best report on the results of the national panels (n=5-10).
- **External experts:** selected experts of citizen engagement (n=8-10).

The expert workshop will be facilitated by a PROSO partner.

3.3.3 Design

The expert workshop is scheduled for the beginning of December 2016 and will take place in Sofia. It is designed as a two-day meeting, which is split into phases during which only PROSO partners meet and phases with external experts. The details are set out below.

The following **preparation material** is required:

- Drafts of the national reports on barriers and incentives from the citizens' perspectives are prepared by the PROSO partners ARC Fund, OEAW, SPI, SURREY and USTUTT, summarizing

their analysis and findings from the first citizen panel meetings. These are informally communicated among PROSO partners.

- A proposal of categories to pre-structure policy and practice options is prepared by PROSO, and is sent to the internal and external experts prior to the expert workshop.

Day 1: Meeting of internal experts

- Meeting of internal experts (PROSO partners), to synthesize results on patterns of enabling and constraining conditions as perceived by the citizens (as those related to different depths, life-world relations of (sub-domains of) R&I, and countries) in order to formulate joint hypotheses (8h).

Day 2: Meeting of internal and external experts

- External experts validate and challenge central findings presented by the internal experts (3h).
- Internal and external experts discuss relevant categories for policy and practice options and begin filling these (3h).
- Internal experts (partners) condense results and prepare further steps (2h).

3.4 Second meeting of the citizen panels: “Validating the experts’ interpretation of the citizens’ perspectives and giving the citizens a voice to prioritize policy options.”

3.4.1 Objectives and expected results

The second citizen panel gives the citizens the opportunity to discuss and validate and/ or amend the experts’ conclusions regarding barriers and incentives. Second, citizens are asked to discuss and prioritize policy and practice options to address the identified enabling and constraining conditions of their engagement in R&I.

Fundamentally, the second citizen panel provides the opportunity to speak with participants again, to validate the experts’ synthesis of the first citizen panel and provide PROSO with a consolidated overview on barriers and incentives from the perspective of the citizens themselves. Furthermore, PROSO will learn about the priorities of citizens regarding policy and practice options to in order to promote their engagement in R&I.

3.4.2 Sampling

Ideally, in all five countries the citizen panel will be comprised of the same people in both the first and the second meeting (n= 21 per country).

Ideally, 1-2 representatives of the expert workshop are present in each of the second national meetings to explain and discuss the expert groups' results with the citizens.

3.4.3 Design

Table 5 describes the overall design of the second meeting of the citizen panels. This second meeting is scheduled for the beginning of February 2017 and should take ca. 4 hours. Again, each country team selects its own date.

Table 5: Process scheme for the second meeting of the citizen panels; design variants are marked in orange type.

Format	Content	Duration
Plenary	Welcome. Representative (s) of expert group present(s) patterns and explanations of enabling and constraining conditions for citizen engagement (synthesis across countries).	45min
Three working groups (option: rotation in form of a world café)	Each citizen group considers a subset of the experts' theses (1/3) and checks whether: <ul style="list-style-type: none"> - The results of <u>their</u> national citizen panel have been appropriately understood? - Anything has to be added/ changed? <p>Option: To ensure that all citizens check all experts' theses, a world-café like rotation of citizens to the other tables could be carried out.</p>	1,5h (+ 1,5h)
Break	***Lunch or coffee***	Ca. 15-40min.
Plenary	Expert group presents their ideas on policy and practice options to promote citizen engagement. Citizens first comment on these ideas, and then vote to prioritize them according to several criteria that will include importance, urgency, relevance, etc. Closure by main facilitator: Summary on central logics of barriers and incentives as well as summary of a 'message' on most important challenges identified and changes required by the citizens. Further steps of PROSO.	1,5h

4. Summary of expected results and their linkages to other PROSO activities

The detailed methodology presented in this document will guide the implementation of the PROSO national citizen panels. In summary, we expect to gain the following results:

- The first meeting of the citizen panels (step 1) will stimulate group discussions among citizens on a set of different engagement opportunities and provide us with rich and detailed qualitative information. This information will capture the citizens' perspectives on enabling and constraining conditions with regards to varying degrees of depth of engagement¹⁹ and different sub-domains of R&I²⁰. The PROSO partners carrying out the citizen panels in their countries will analyse the group discussions of their national panels and condense the main results into draft national reports.
- The subsequent expert workshop will allow partners to further condense and synthesise insights about patterns emerging from the citizens' perspectives on barriers and incentives of citizen engagement in R&I, including an understanding of the role of the different degrees of depths of engagement, the (potential) role of country contexts and the (potential) role of different characteristics of sub-domains of R&I for the perception of these barriers and incentives. In addition, internal and external experts will prepare a list of different types of policy and practice options to be presented to the citizens during the second citizen panel meetings.
- The second meeting of the citizen panel then is used to validate and to re-contextualize the experts' synthesis. It provides PROSO with a consolidated overview of barriers and incentives from the perspective of the citizens themselves. Furthermore, PROSO will generate insights into the priorities of citizens regarding policy and practice options to promote their engagement in R&I.

The insights that will be gained through the three events that form the core of WP4 will be published in Deliverable 4.2 ("National Reports Citizen Panels" in February 2017), and Deliverable 4.3 ("Synthesis Report Citizen Panels" in May 2017). The PROSO citizen panels will provide important input into **the subsequent activities** of the PROSO project. The results of WP4 will provide a sound empirical basis to include the perspective of non-organized citizens into the **multi-actor conference** on policy and practice options (WP5, scheduled for June 2017) and inform the **PROSO policy and practice guide** (WP6).

¹⁹ Citizens will compare and discuss heterogeneous depths of engagement at the examples of science café vs. citizen dialogue vs. participatory budgeting.

²⁰ Citizens will discuss engagement related to the examples of three sub-domains of R&I with varying life-world relation, namely "CRISPR/CAS or gene editing" (bio-economy), "nanotechnology to monitor and clean up the environment" (nanotechnology), and "sweeteners to promote good health" (food and health).

Literature

- Amodio, Luigi et al. (2015): Public Engagement Innovations – Catalogue of PE initiatives, Deliverable 1.2 of the EU project PE2020 Public Engagement Innovations for Horizon 2020
URL: http://pe2020.eu/wp-content/uploads/sites/15/2014/02/Public_Engagement_Innovations_H2020-2.pdf; last retrieval 30.05.2016
- Burget, Mirjam; Bardone, Emanuele; Pedaste, Margus (2016): Definitions and Conceptual Dimensions of Responsible Research and Innovation: A Literature Review. In: Science and Engineering Ethics, 1-19
- Castell, Sarah et al. (2016): Public Attitudes to Science 2014. Main Report. London, Ipsos MORI Social Research Institute
URL: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/348830/bis-14_p111-public-attitudes-to-science-2014-main.pdf, last retrieval 30.05.2016
- Davis, Sarah R. (2014): Knowing and Loving: Public Engagement beyond discourse. In: Science & Technology Studies, 27 (3), 90-110
- Engage2020 consortium (2014): Public Engagement Methods and Tools, Deliverable 3.2 of the EU project Engage2020;
URL: <http://engage2020.eu/media/D3-2-Public-Engagement-Methods-and-Tools-3.pdf>; last retrieval 30.05.2016
- European Commission (2010): Special Eurobarometer Science and Technology, Report
URL: http://ec.europa.eu/public_opinion/archives/ebs/ebs_340_en.pdf; last retrieval 30.05.2016
- European Commission (2016): <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/public-engagement-responsible-research-and-innovation>; last retrieval 30.05.2016
- Frankenfeld, Philip J. (1992): Technological citizenship: a normative framework for risk studies. In: Science, Technology and Human Values, 17 (4), 459-484
- Goede, Wolfgang C. (2013): Die Wissenschaftsdebatte: Forschung, Technik und Zivilgesellschaft im Gespräch. Dossier über ein neuartiges Beteiligungsformat. Ein Projekt der Journalistenvereinigung für technisch-wissenschaftliche Publizistik TELI e.V.. In: MAECENATA Institut, Berlin
URL: http://www.maecenata.eu/images/documents/mi/resources/2013_op68.pdf; last retrieval 30.05.2016
- Habermas, Jürgen (1981): Theorie des kommunikativen Handelns, Band 2: Zur Kritik der funktionalistischen Vernunft, Frankfurt am Main: Suhrkamp
- Irwin, Alan (2008): Risk, science and public communication. Third-order thinking about scientific culture. In: Bucchi, Massimiano; Trench, Brian (Eds.): Routledge Handbook of Public Communication of Science and Technology, 199-212
- Jacobi, Anders; Klüver, Lars; Rask, Mikko (2010): Relevant Research in a Knowledge Democracy: Citizens' Participation in Defining Research Agendas for Europe. In: in 't Veld, J. Roeland (Ed.):

- Knowledge Democracy: Consequences for Science, Politics, and Media. Berlin, Heidelberg: Springer, 87-98
- Jensen, Eric; Buckely, Nicola (2012): Why people attend science festivals: interests, motivations and self-reported benefits of public engagement with research. In: Public Understanding of Science, 1-17
- Kleinmann, Daniel Lee; Delborne, Jason A.; Anderson, Ashley A. (2009): Engaging citizens: The high cost of citizen participation in high technology. In: Public Understanding of Science, 1-20
- Krabbenborg, Lotte; Mulder, Henk A. J. (2015): Upstream Public Engagement in Nanotechnology. Constraints and Opportunities, In: Science Communication, 1-33
- Lidskog, Rolf (2008): Scientised citizens and democratised science. Re-assessing the expert-lay divide. In: Journal of risk research 11 (1-2), 69-86
- Miles, Matthew. B.; Huberman, A. Michael (1994): Qualitative Data Analysis. An Expanded Sourcebook, Second Edition. Thousand Oaks: Sage
- Nov, Oded; Arazy, Ofer; Anderson, David (2011): Technology-Mediated Citizen Science Participation: A Motivational Model. Proceedings of the AAAI International Conference on Weblogs and Social Media (ICWSM 2011). Barcelona, Spain, July 2011
- Nov, Oded; Arazy, Ofer; Anderson, David (2014): Scientists@Home: What Drives the Quantity and Quality of Online Citizen Science Participation? In: Plos One, 9 (4), e90375
- Owen, Richard; Macnaghten, Phil; Stilgoe, Jack (2012): Responsible research and innovation: From science in society to science for society, with society. In: Science and Public Policy, 39, 751-760
- Rowe, Gene; Rawsthorne, Dee; Scarpello, Tracey; Dainty, Jack R. (2010): Public engagement in research funding: a study of public capabilities and engagement methodology. In: Public Understanding of Science, 19, 225-239
- Schuurman, Dimitri; De Marez, Lieven (2009): User centered innovation: towards a conceptual integration of lead users and living labs. In: Proceedings of COST298-conference: The Good, The Bad and The Challenging, 13-15
- Slegers, Claudia; Zion, Deborah; Glass, Deborah; Kelsall, Helen; Fritschi, Lin; Brown, Ngiare; Loff, Bebe (2015): Why do people participate in epidemiological research? In: Journal of Bioethical Inquiry, 227-237
- Stilgoe, Jack; Lock, Simon J.; Wilsdon, James (2014): Why should we promote public engagement with science? In: Public Understanding of Science, Special Issue: Public Engagement in Science, 23, 4-15
- Sturgis, Patrick (2014): On the limits of public engagement for the governance of emerging technologies. In: Public Understanding of Science, Special Issue: Public Engagement in Science 23, 38-42
- Wilkinson, Clare; Dawson, Emily; Bultitude, Karen (2012): Younger people have like more of an imagination, no offence: Participant perspectives on public engagement. In: International Journal of Science Education, Part B: Communication and Public Engagement, 2 (1), 43-61

Annex

Annex A: The sub-domains of R&I to be presented via vignettes

“CRISPR/CAS or gene editing” (Bio-economy, OEAW)

General: CRISPR/CAS or gene editing is a method allowing more targeted and faster gene editing. Genes can be introduced, deleted or switched of in a comparatively easy and effective way.

Future potential applications: Potential applications are expected in agriculture, industry and medicine (humans, gene therapy).

Social and ethic aspects: The method is characterised by a high conflict potential, strong regulatory need and addresses the fundamental question whether this kind of research should be allowed or even funded, particularly when concerning humans.

“Nanotechnology to monitor and clean up the environment” (Nanotechnology, OPTIMAT, USTUTT)

General issue: Research on nanotechnology focuses on both, nano-structured sensors for monitoring and measuring environmental pollution, and on nano-particles to remediate environmental pollution.

Potential and experimental applications:

Nano sensors: Remote monitoring of pesticide levels in water (AWACSS); Nano structured sensors in distributed wireless networks for the detection of atmospheric pollutants (city of Milan) – allowing real-time monitoring of hotspots

Nano-particles: Nano scale iron particles are pumped into ground water to decompose toxic materials (field trials in Czech Republic realized - AQUATEST); magnetic nano scale iron oxide particles used to remove arsenic from ground water (various sources); using titania nano-particles on concrete or glass to break down pollutants such as nitrous oxides and volatile organic compounds (Ital Cimenti, Pilkington Glass).

Social and ethical aspects: At the same time, this domain of research raises issues of environmental safety because nano-particles are released into and could potentially accumulate in the environment; of safety due to the explosive character of the iron nanoparticles (zero-valent iron); and concern of surveillance by nano-structured sensors, which could identify individual polluters.

“Sweeteners to promote good health” (Food and health, SURREY)

General: A way to successfully reduce the amount of sugar that humans consume and improve overall population health could be to alter the nutritive and non-nutritive sweeteners contained in food and drink.

Present issues and applications: These sweeteners include a diverse group of products that can be natural or artificial, from diverse geographical origins, involve a range of processing methods, and vary drastically in calorie and nutrition content, and which have a vast number of current and future potential applications in processed foods manufacturing

Social, ethical and legal aspects: This solution to the ‘obesity epidemic’ is controversial, though, because information is lacking about new and emerging sweeteners throughout the agri-food production chain, particularly in regard to sustainability, safety, quality, and allergenicity; there are also strong concerns about the toxicological impact of high doses, and the effects of using sweeteners for a prolonged period, or of using multiple sweeteners together.