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SUPER MoRRI – Scientific understanding and provision of an enhanced and robust monitoring system for RRI

D.5.1 Case Study co-creation methodology report

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EXECUTIVE SUMMARY

This *Case Study Co-creation Methodology Report* (Deliverable D5.1) is the first deliverable of work package five and a supplement to the Strategic Plan 2020-24 (WP1) and the Implementation Plan 2020-24 (WP2) within the SUPER MoRRI project. On the one hand the report aims at highlighting the development of the selection of the first six case study projects within the first phase of SUPER MoRRI. On the other hand it presents the case projects and their specification on the key aspects of the work package: definition of RRI and practices used in the projects, RRI keys, benefits, involved actor groups and countries, levels of implementation and methods used.

The development of the research programme shows that we implemented several steps in the first 13 months of the project to ensure a selection of high quality case projects, which are in line with the orientation, strategy and implementation of the overall project. The project selection process advanced in several feedback loops and included all partners involved in WP5 in a co-creational way.

The research programme is based on the following projects:

CWTS will work on *CSOs at the Science-Society Interface*, University of Bergen will lead the project on *Coding of ethics and values into autonomous systems* (University of Bergen), Ingenio / CSIS guide the project on *PVRC – Public value research careers* (Ingenio / CSIC), IHS will focus on the project on *Creating knowledge for societal transformation: Transdisciplinary research (funding) in JPI climate*, Fraunhofer is going to elaborate on *Gendered Eco-Innovations* and Aarhus University will operate on the topic of *Alignment of preferences, practices, and repertoires in public engagement with science.*

Most of the projects will focus on the meso / organisational level of implementation, but also micro and macro levels are respected. All RRI keys are well presented over the whole selection of projects and the coverage of benefits is well balanced. All kinds of actor groups are addressed and integrated over the whole range of case projects.

According with WP1 and WP2, after the first implementation period, a mid-term reflection and review will analyse first insights, new developments and results emerging from the work of the project and beyond. For WP5 it is the aim to ensure a high level of reflection between and quality of the case projects. Therefore, the WP5 research programme also includes guided reflection and exchange between partners for the whole period of case research implementation.

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1 INTRODUCTION

The aim of this document is to contribute to the development of a monitoring framework for Responsible Research and Innovation (RRI). This *Case Study Co-creation Methodology Report* (Deliverable D5.1), abbreviated as Case Research Plan,[1] sets out elements of the empirical research programme planned for the SUPER MoRRI research project in the period 2020-24. It is a companion piece to the Strategic Plan 2020-24 and the Implementation Plan 2020-24, which describe the overall approach of the project (WP1) and a planned set of data collection vehicles that will underpin periodic Monitoring Reports (WP2) respectively. All three of these planning documents will be updated periodically throughout the life of the SUPER MoRRI project according to milestone events, a process of mid-term reflection and review, and new developments emerging from the work of the project and beyond[2]. Together the three planning documents provide conceptual and research programme pillars (see Figure 1) that will structure the definition, selection and operationalisation of our research questions.

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[1] Note: The abbreviated title *Case Research Plan* refers to a set of research projects that look at a wide variety of the different aspects of RRI and seek to deliver contributions to the SUPER MoRRI monitoring framework (e.g. indicators or other data outputs). It does not mean that WP5 research projects (either in wave one or wave two) are to be developed as single case study designs, although this may be how some projects with a strong focus on process will be (best) designed. However, in the development of most research projects it was preferred to involve some degree of comparative dimension according to their respective unit/level of analysis (e.g. country, region, organisation, project, discipline). These projects will therefore produce data and information from multiple research sites to facilitate comparisons that can enhance our learning about potential monitoring innovations.

[2] This means that changes in the landscape will influence the process of the project as well as aspects we uncover in our work during implementation that are related to external environment factors.

Figure 1.   SUPER MoRRI project development: three pillars
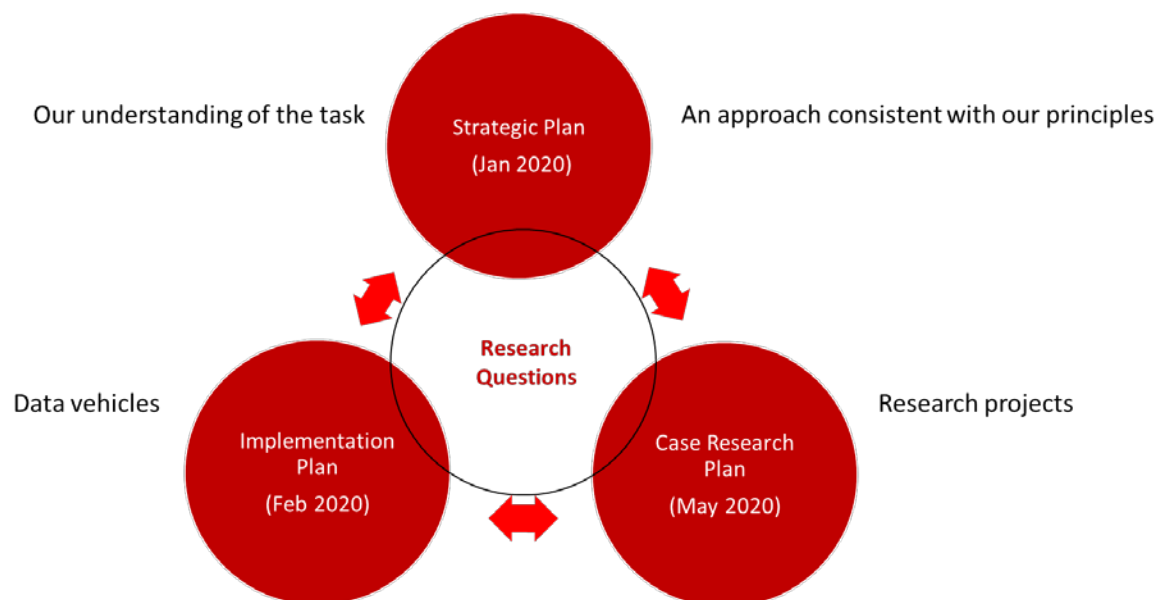
Source: SUPER MoRRI Strategic Plan, p. 4

This report is part of Work Package 5 (WP5) of the SUPER MoRRI project.[3] The Case Research Plan reports on task 5.1 in WP5, to design and develop a research programme of empirical studies that could provide new insights regarding how to monitor RRI and produce new data suitable for indicator development. (More information on the SUPER MoRRI approach to responsible indicator development can be found in the Strategic Plan, D1.2.) The studies that make up the WP5 research programme will also, in some cases, use data produced in the data vehicles developed in WP2 (Figure 2) or produce complementary information that can deepen our understanding of processes and potential pathways for benefits of RRI (see the Implementation Plan for more details). In this way, the research conducted in SUPER MoRRI intends to build cross-links between different sources of data in order to strengthen our overall understanding and diversify our monitoring resources.

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[3] The main objectives of WP5 are:
- To specify and to systematize the scientific, democratic, societal and economic benefits of the six RRI keys;
- To clarify pathways from RRI practices and policies to benefits, and their interrelation between different keys;
- To investigate and identify patterns of RRI and its benefits using large scale data sets;
- To synthesize the results and identify sources of replicable data from which indicators for monitoring the benefit of RRI could be developed.

Figure 2.   SUPER MoRRI data vehicles
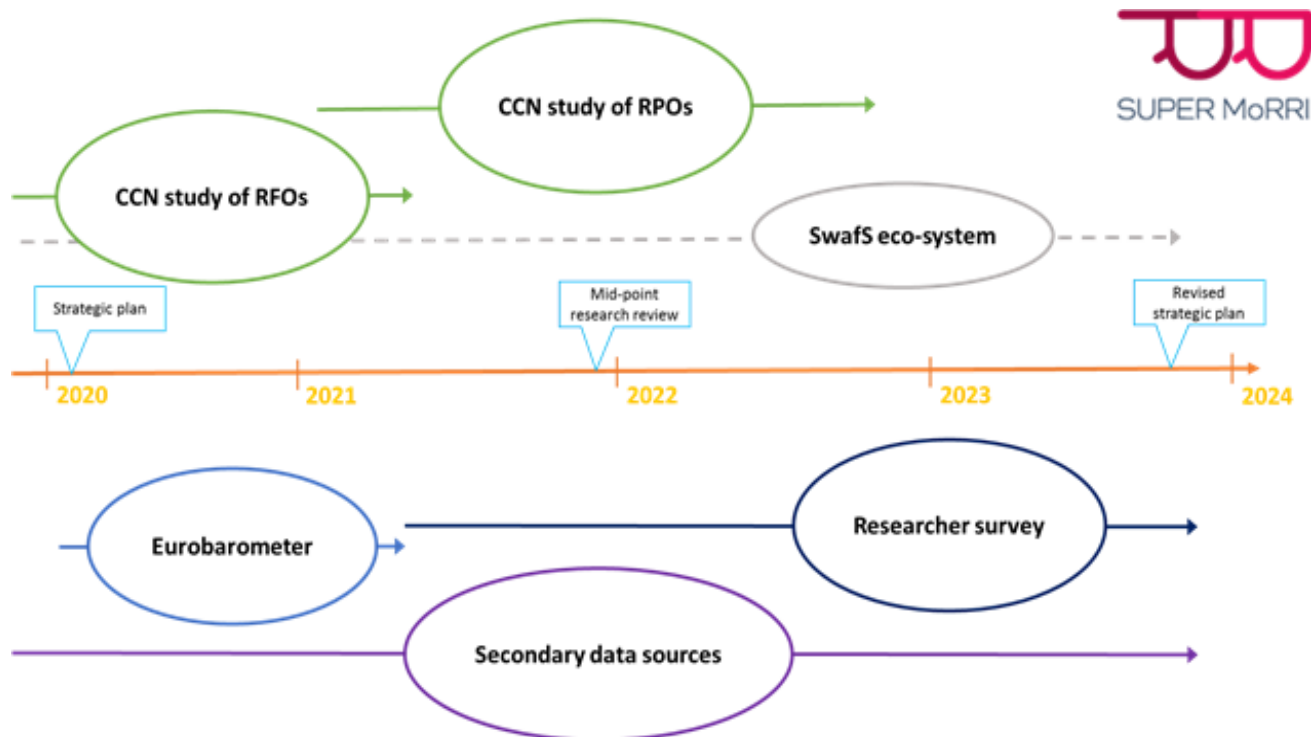
Source: SUPER MoRRI Implementation Plan, p.4

This report explains the process through which the SUPER MoRRI consortium conducted an Open Call for research projects among consortium members, developed a set of criteria to ensure studies were aligned with the overall needs of the project and the development of the RRI Monitoring Framework, assessed available resources and proposed project needs, and then selected a number of projects for the first wave of SUPER MoRRI case research projects. Following the SUPER MoRRI Description of Work, the process also took into account the desirability of addressing different RRI keys, pathways to different types of benefits (scientific, democratic, societal and economic), levels of analysis (macro – meso – micro), actor groups and countries. Mindful of the need to be realistic regarding available resources, the consortium aimed for a variety of cases that address a wide range of RRI aspects and focus on RRI pathways from diverse perspectives. A diverse mixture of methods and sources will be utilised in the studies undertaken, with the aim of creating novel sources of data and information and potential new indicators for monitoring RRI.

The programme of research summarised in this document is, at the time of writing, placed under some timeline uncertainty by the SARS-COV-2 virus and the COVID respiratory illness that has impacted all countries and regions in the SUPER MoRRI consortium. The implementation of the research programme described here will depend significantly on progress with regard to this public health emergency. At this stage, a mid-point research review for the overall project (see also D1.2 and D2.1) is scheduled for the end of 2021 that will also include the work in WP5 until then. This review is designed to analyse outcomes and interim findings of the first round of case studies. A subsequent

second round of research studies will be developed, including ones addressing emerging opportunities or gaps identified in the mid-point review, in the course of the work being undertaken in SUPER MoRRI, or as emerging in the external environment.

In what follows in this report, Section 2 (p.10) provides a description of the research programme design and development. Section 3 (p.21) then documents the research projects chosen for the first round of work. Section 4 (p.32) briefly sets out the future tasks of WP5 and reflects on potential matters arising.

2 SUPER MORRI CONSORTIUM WP5 RESEARCH PROGRAMME DESIGN & DEVELOPMENT PROCESS

The first part of this section describes the process in which the consortium developed its research programme and explains how the project selection process advanced in several feedback loops. This process started in 2018 during the preparation of the proposal and continued until the writing of this report in spring 2020. It involved the entire consortium, building on partners' ideas and research competences.

WP5 developed this process through several feed-back loops and constant exchange with other WPs, particularly in order to foster alignment with the strategic (WP1) and implementation (WP2) plans. The consortium explored and developed the overall approach during consortium meetings, aiming for a shared understanding of how to embed WP5 activities in the project's design. Bilateral talks with individual partners involved in WP5 helped to clarify the ideas and goals of each research project.

In the first part of this section we describe the co-creation process in some detail. The summary only includes issues relevant for WP5 and does not cover the full range of issues that have been tackled in meetings (which can be found in Meeting Minutes). In the second part of this chapter we provide the final design and criteria developed for the selection of individual research studies (Section 2.2, p. 16).

2.1 Development of the SUPER MoRRI Case Research Plan

2.1.1 From MoRRI to SUPER MoRRI – Lessons learned

The development of the SUPER MORRI Case Research Plan has a long genesis. The development of design criteria and the project selection process had already begun during proposal writing in 2018. The proposal included a critical reflection of the preceding MoRRI project in which many consortium partners were involved. The proposal also included nominations of potential future studies that might be undertaken in SUPER MoRRI.

The MoRRI project included a case study programme that produced twenty vignette cases. As MoRRI was designed such that the case studies were important, they were planned to be of limited depth. These case studies provided valuable initial insight into the societal, democratic and economic benefits of RRI and uncovered a category of benefits of RRI that often remained unrecognized, i.e. scientific benefits for research. Despite these achievements, the case study programme had limitations. First, it was basically exploratory. Second, case selection often followed pragmatic arguments because of limited resources; data availability was a key selection criterion. Third, because of limited resources, collection of primary data was impossible and case studies relied on already available data, evaluations and assessments of RRI activities. Fourth, causality claims between RRI activities and their impact were not based on systematic and original long-term studies, but rather on anecdotal evidence gained from expert interviews, self-assessment by stakeholders involved in the project and/or MoRRI researchers

or limited and/or unsystematically collected data. Thus for common reasons, case selection followed pragmatic arguments and data availability was often a key selection criterion.

The consortium concluded from these discussions that more substantial empirical studies would both enable SUPER MoRRI to extend the uncovered aspects in MoRRI that link RRI and different types of benefits, and allow the team to conduct new empirical experiments that could be added to the monitoring toolbox. Well-founded and clear criteria for project selection were required to secure research quality but also to prevent overlap between projects in terms of their focus on particular keys, types of benefits, stakeholder groups, countries, etc. In this way the research programme in WP5 would maximise the scope of its investigations within the frame of the available resources, whilst also designing each study to be of excellent scientific quality.

2.1.2 Kick-off Meeting: Research gaps, RRI in context and the notion of benefits

The general discussion at the kick-off meeting in Karlsruhe in early 2019 on the scope of SUPER MoRRI and WP5 highlighted the following issues:

First, the consortium identified a knowledge gap in the MoRRI project between the meso-level of RRI implementation and the pathways to RRI (benefits for RPOs, universities, etc.). The consortium concluded that this link should be a major focus of SUPER MoRRI.

Second, the consortium emphasised the importance of understanding how outputs, benefits, and impacts emerge in order to be able to grasp internal and external factors that foster and hinder RRI. Using a combination of data vehicles (WP2) and focused studies (WP5), SUPER MoRRI should endeavour to take a systematic approach for describing and understanding patterns of RRI activities and how these contribute towards pathways for societal, economic, democratic and scientific benefits. The project should also seek to understand why different stakeholders engage in RRI (or not), elucidating their motivations and the circumstances under which they act. SUPER MoRRI should also seek ways to monitor institutional support in fostering/hindering RRI and the role of institutions in supporting individuals' RRI behaviour and practices.

Third, it became clear that the consortium had different perspectives on benefits. Although the consortium agreed that societal, economic, democratic, scientific benefits have to be addressed in the case study programme, several partners were sceptical whether it would be feasible to address all benefits in each case study. They called for caution not to raise expectations higher than what can be fulfilled in the empirical programme. In particular, consortium members were sceptical about the feasibility of constructing indicators of an RRI benefit *per se*, given the challenges of time lag and attribution in such highly complex systems as research and innovation. Nevertheless, consortium members were keen that the empirical studies should consistently include a focus on identifying and, where possible, exploring pathways to benefits from RRI.

2.1.3 Consortium Meeting Valencia[4]

At the consortium meeting in Valencia in June 2019, the consortium continued the discussion on how to meaningfully conceptualise benefits of RRI. Discussion showed that the consortium was dissatisfied with a simplistic concept of benefits understood as the "results of RRI". The consortium therefore advocated the use of an open and general notion of "impacts" or "output-outcomes-impacts" instead. No final decision was made how to define "benefits" and the discussion on how to operationalise and to include benefits in the case research programme was continued in subsequent meetings.

The consortium agreed that it was inappropriate to narrow down understandings of RRI and how these shape monitoring potentials. Against the background of concepts that see RRI as an intervention, the consortium came to an understanding to also incorporate conceptualisations of RRI as an endogenous practice of responsibility. Rather than strictly focussing on RRI interventions only, SUPER MoRRI should also address practices of responsibility that are linked with a governance perspective (mirroring somewhat academic discussion of *de jure* and *de facto* RRI). Therefore, the case study programme should also include projects or approaches towards RRI that engage with a variety of practices of responsibility and changes without using the term RRI explicitly.

The consortium agreed that RRI was about interdisciplinarity and should consider a systemic, actor-oriented approach that takes into account contextual factors. Moreover, it should integrate in its core the concepts of inter- and trans-disciplinarity.

Discussions evolved around the potential value of a general research heuristic and suitable framework for the different studies. A necessary next step in this direction was that IHS, as WP lead, scanned the literature with a focus on implicit and rudimentary theories of change and other potential interpretive frameworks and process models for assessing change (e.g. productive interactions, but also assessing practices of reflexivity using the AERA model of RRI were discussed).

In parallel during summer 2019, the IHS team talked to other WP leads to secure alignment of WP5 and the other work packages.

2.1.4 Stakeholder Workshop Brussels and consortium meeting[5]

The next steps in the process were the stakeholder workshop in September 2019 in Brussels and the subsequent consortium meeting where results of the workshop were reflected.

It was discussed that RRI was about responsible institutions and we want to understand how the path of RRI develops in organisations. The question arose around which kind of indicators inform users of the monitoring system about institutional change and which could support the users and this change.

The opinion within in the consortium, but also from stakeholders in the workshop was, that SUPER MoRRI – and especially WP5 – should not over focus on the Commission's RRI keys, because then a systemic and contextual perspective would be excluded. René van Schomberg in his presentation at

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[4] The summary of the meeting in Valencia is based on the meeting minutes provided by Merve Yorulmaz.

[5] Summary refers to minutes written by Josephine Bergmans and Paula Otero-Hermida.

the workshop repeated that RRI is about systems change and not solely single keys and indicators. In order to better understand the contextual, institutional (support) and individual factors and motives - so to understand the systemic and cross-issues between them –, arguments were strengthened to place a significant focus on meso-level, both in WP5 projects but also in the project as a whole. This mirrored similar discussions that occurred previously at the project kick-off meeting.

Cross-linkages between data vehicles being developed in WP2 and the projects being implemented in WP5 were to be encouraged. Some studies should use data from multiple sources and where possible, include data from the Researcher Survey, Eurobarometers and the Country Correspondent Network (CCN) studies to triangulate or as complementary sources. On the one hand, WP2 data vehicle based studies were envisaged with a primary emphasis on uncovering of patterns of RRI activities and/or effects at different levels of analysis (but primarily the meso-level), whilst opening up comparative dimensions for the exploration of pathways toward RRI benefits. On the other hand, WP5 case studies should include a comparative dimension that uncovers limited patterns, whilst taking the opportunity wherever possible to explore processes and produce a deeper understanding about how the pathways to RRI and RRI benefits emerge.

There was common agreement in the consortium that we need to be very conscientious about the way we develop indicators, that we are ourselves responsible for how and for which purpose indicators are developed. Actors need clear and explicit indicators, but they should not be seen as a burden or put additional pressure on actors. Ideas about the ways emerging indicators should be accompanied by interpretive models and other contextual information and should be co-designed with potential users are introduced in the Strategic Plan (D1.2).

2.1.5   An Open Call for a first wave of research projects

The SUPER MoRRI consortium members were in favour of an open internal call for the first wave of research studies in WP5. The logic for an initial open call was linked to members' research competences, areas of expertise and interests, and the potential to maximise the use of resources.

After the stakeholder workshop and the subsequent consortium meeting, CSIC sent out a template to collect first case study ideas. The template asked SUPER MoRRI partners to provide information about their ideas, such as:

- Proposing partners for the case study
- Main collaborators
- Research question(s)
- Description: Outline of the project in whatever level of detail is considered sufficient to communicate the essence of the work to the rest of the SUPER MoRRI team
- Methods
- Relation to SUPER MoRRI: Is it a 'pattern' or 'process' study, or something else? What is(are) the level(s) of analysis? What could the study contribute to SUPER MoRRI?

- Timing and resources needed: Estimate of how long the study will take (months); What PMs, travel, etc are foreseen
- Metrics/indicators: Are there potential metrics or indicators for RRI monitoring you possibly foresee emerging from the study? Or, if more explorative, steps toward future monitoring possibilities in any identifiable direction
- Further comments: Space for other comments, information, etc.

This initial collection of ideas resulted in 10 potential cases.

It was determined there should be two further consortium meetings in Vienna and Valencia in late 2019 to further develop individual projects and the empirical programme overall. These meetings were set up as workshops in a co-creational way in order to discuss in plenary (e.g. in creative dialogue session), as well as in group settings (e.g. reflecting teams), burning issues and decisions towards concerted steps in developing the strategic, implementation and case research plans.

2.1.6   Meeting in Vienna: narrowing the focus of SUPER MoRRI and first case selection

As leader of WP5, IHS was charged with the difficult task of ensuring each proposal met a threshold of quality and rigour, particularly in regards to explicitly framing the study in key RRI-related concepts and how it could contribute to the Monitoring Framework overall.

In preparation of the meeting in Vienna, an internal document was prepared by colleagues from IHS, CWTS and CSIC/Ingenio and shared amongst all partners in order to display open issues and refine the research strategy.

In discussions at the meeting in Vienna in November 2019, participants concluded that one focus of SUPER MoRRI should be the activities that support the R&I system to become more responsible, e.g. responsible research practices, and which kind of responsible labour is supported by incentive structures in the R&I system. Wherever possible, mapping RRI pathways should begin with the integration of diverse sets of actors and consider their networked implementation activities, how they aspire to generate impact (scientific, economic, democratic and societal benefits) or how they demonstrate the emergence of such benefits.

The meeting concluded with open brainstorming and discussion of research questions. Identifying broader research questions about different aspects of change and benefits was decided as a discussion point for the following meeting in Valencia. Partners agreed that it was crucial to define a research frame where the different approaches, including flexibility to investigate both patterns of RRI activities and pathways toward RRI benefits, would all have sufficient space for development.

2.1.7   Second round of case selection: making case studies concrete at the meeting in Valencia

At the meeting in Valencia in December 2019, the consortium again took up the work of WP5 involving the development and specification of the case research plan and the selection of studies. In an interactive session, case proposals from the first round were picked up and a short list of proposals

was generated. To this end, the WP5 lead asked all partners to select one or two of their case study ideas and reflect within their institutional teams on the following questions:

- Please, write one sentence on what burning question the case study addresses.
- How is the proposal/project connected to the implementation plan?
- How does it contribute to the monitoring framework?
- How does it produce knowledge relevant to the users?
- Who does it? Who is involved? Which partners from the consortium are involved?
- How will it be implemented? Specific steps in order to complete the study. Flashing insight in steps, methods, resources.
- Timing?

In a plenary session the consortium members discussed the different case proposals which were presented individually by consortium partners. After the meeting, the WP5 lead asked individual partners to refine their answers to the above-mentioned questions and to summarise them in one document. By the end of January 2020, eight proposals were then elaborated on in a final round of case study explanations.

Following the consortium meeting in Leiden (January 2020), IHS suggested a final set of concrete steps towards a common ground and the goal of reaching a deep understanding of each proposed project. Bilateral talks were held with those who had suggested case study proposals in February 2020. The results confirmed the diverging interests of the consortium in regards to the necessity of a joint theoretical framework and also on the integration of keys, benefits and impacts of RRI.

In order to facilitate comparison between potential project cases and ensure quality within WP5, an elaborate questionnaire was set up by WP5 lead. This included several questions referring to the definition of RRI, RRI practices and key(s) used in the specific case, connection to WP1 and WP2, securing to assessment pathways for RRI and also defining methods and resources for implementing the single case studies.

2.1.8 *Third and fourth round of case selection: Continue to narrow the number of cases*

By mid-March 2020, the Corona crises started to impact the project. Further face to face meetings became impossible and communication has since been restricted to the Internet. Therefore, the WP5 lead created another questionnaire by the end of March that would motivate consortium partners to continue clarifying the focus and design of their case studies to safeguard that all cases address the major objectives of WP5 appropriately, i.e. to elaborate on RRI pathways, including RRI key(s) and practices, assessing benefits of RRI and alignment with the strategic plan of SUPER MoRRI.

WP5 lead addressed each partner with the elaborated questions and direct feedback on earlier versions, including specific requests in line with the objectives of WP5. Following this, WP5 lead collected all information received from partners by beginning of April, produced an overview and

checked whether the proposals fit the criteria and the overarching WP goal of serving the monitoring framework. Another WP5 team meeting (including all partners involved in the implementation of case studies), bilateral discussions and reflection with colleagues from CSIC and University of Bergen resulted in a final collection of six case studies.

A fourth and last feedback loop at the end of April 2020 finalized and specified certain aspects of each case project, answering open questions and closing gaps regarding each case in the line with WP5. This last round of inquiry contained three new questions on the assessment of pathways towards RRI and operationalisation of benefits and practices of RRI.

Partners again elaborated on their proposals; the final versions of case study descriptions were submitted by beginning of May 2020. Minor modifications happened on request of WP5 lead in the second half of May and the final versions are included in the Annex (p.29).

2.2 Summarising the final design and quality criteria for individual research studies

The second part of this section includes the criteria for ensuring consistency in the design of the empirical research studies cases.

For the case research programme in SUPER MoRRI, all cases needed to align with the goal of WP5 to assess pathways of RRI and further line up with the strategic plan. The studies are intended to develop insights into how RRI is implemented downstream, not only upstream, and which impacts it has on society and the research system. Studies have different starting points for their empirical work (e.g. either have a more inductive or deductive approach on the pathways to be assessed), but they needed to have a clear and reflexive understanding of their definition of RRI (which needs to be based on the theoretical assumptions made in D1.2), RRI practices and the way the studies intended to explore the pathways to benefits of RRI.

2.2.1 Protocols for empirical research projects

The development of individual projects was controlled via the use of a comprehensive protocol. Project proposers were required to provide multiple iterations of the protocol. Fields were added over time to reflect emergent information needs.

The protocol (included in Table 1) accompanied the extensive collaborative elaboration process that is illustrated in Section 2.1 (above, p.10). In the left column, the respective question or information required is stated; in the right column a detailed description for the information in demand is specified.

Table 1: Case study specification questionnaire

SUPER MoRRI case research project development protocol	
Question	**Content requested by the partners**
Title	Title of the case study.
Research Question.	The research question(s) of the case.
Which current state of problem is the project seeking to influence? Why exactly did you choose this case?	Description of the purpose of the case. Partners should elaborate why they wanted to work on the case and why the topic was burning and relevant for the overall framework.
Which concept and definition of RRI do you use in your case study?	The concept of RRI used for the case should be described, with reference to the conceptualisations used in the strategic plan (D1.2, p. 6-9). If the case was using key dimensions, it should be explained how they are defined and why this/those specific key(s) are/were selected.
RRI concept used in the case	Definition of RRI concept used.
RRI keys used in the case	Definition of RRI key(s) used.
4.b. 1) How are you going to operationalise the key(s) in focus?	Operationalisation of key(s).
Definition of "RRI practices"	Specification of RRI practices that are in focus of the research, how they are defined; which practices are expected to be dealt with in the case.
4.c. 1) How are you going to operationalise the practices in focus?	Operationalisation of key(s).
How will the three-part model of integration, implementation and impact (i3) defined in the strategic plan be integrated in your case/project?	To align with the strategic plan, partners were asked to refer to the three-part model of integration, implementation and impact (i3) in their case studies.
Integration:	From D1.2, p. 7-8: Integration of diverse actors, knowledges, capabilities and interests, refers to the mobilisation of individuals, organisations, institutions, technology and resources for R&I. Integration occurs at multiple levels of an organisation and with varying scope. It includes formal vehicles such as strategic alliances, contracts, projects and informal

SUPER MoRRI case research project development protocol	
Question	**Content requested by the partners**
	arrangements of cooperation. Integration is relatively responsible when it is plural, diverse and inclusive.
	→ Who is involved? on what basis is the participation of diverse actors organised? what types of knowledge and technology are involved? how are citizens involved?
Implementation:	From D1.2, p. 7-8: "Implementation refers to collective research and innovation processes and practices. Implementation pathways are relatively responsible when based on negotiated and interdependent goals, mutual commitment to avoiding adverse social, environmental and other effects, and shared (normative) expectations regarding users and beneficiaries.
	→ How are interactions organised? how are priorities developed and agreed upon? how are conflicts between goals, or among priorities, exposed, debated and resolved? Are processes transparent and activities open and inclusive? how are emerging scientific controversies, technical obstacles and/or societal uncertainties treated? are multiple innovation pathways generated and developed?"
Impact:	Which kind of impact to you expect? Describe impacts and impact pathways.
	From D1.2, p. 7-8: "Impact therefore refers principally to transformations in processes, connections, capacities, attitudes, identities and anticipated possible futures, rather than to the outputs and outcomes of R&I they carry."
	→ How do users of research and innovation provide feedback to knowledge producers and innovators? are potential beneficiaries included in the R&I cycle and at which point? how do networks of users transmit and modify innovations? do beneficiaries have the potential to become users? where do these translations spread and who do these networks include? how are emergent effects of innovations governed by users and beneficiaries and communicated to producers, innovators and/or regulators?
Which definition of change do you use?	The underlying theories of change and presuppositions should be specified in detail. For example, which kinds of change are expected to be observed should be described. (see also D1.2, chapter 2.2 Narratives of Transformation ⇆ Theories of Change, p. 9-11) "Which assumptions about how these changes might happen do you have? check on whether the

SUPER MoRRI case research project development protocol	
Question	**Content requested by the partners**
	activities and outputs are appropriate for influencing change in the desired direction for this context. Which process/sequence of change do you anticipate to lead to the desired long-term outcome" (Vogel 2012)[6]
What changes do you expect to happen?	Partners should elaborate which kind of changes they would expect when observing RRI pathways in their study.
How will you consider contextual factors relevant for assessing pathways and impacts of RRI? (See also "credible contextualisation" in D1.2)	Which contexts for the impacts and pathways are expected to be relevant for the study, including social, political, systemic, environmental, organisational and individual conditions/dimensions. (Blamey & McKenzie 2007, Mayne 2017). It should be described how they will be taken into account when implementing the study and which methods would be used to assess contextual factors.
How does the study contribute to the monitoring framework (WP1)?	With reference to the strategic plan, partners should reflect about the connection of the case to the monitoring framework.
How is the study connected to the implementation plan (WP2)?	Partners should think about how their case would connect to the implementation plan and data assessment in WP2.
How does the study contribute to answering the main question in WP5: to better understand the downstream pathways of RRI practices and policies?	All case study contributors should describe how the study contributes to clarifying subtle pathways from RRI practices and policies to the emergence of different kinds of impacts and benefits of RRI (WP5 objective). The goal was to focus on the question to what extent the study will actually study pathways downstream of RRI, thus studying changes in the implementation of RRI practices and policies. "Impact pathways describe causal pathways showing the linkages between a sequence of steps in getting from activities to impact. An intervention may have several pathways to impact", Mayne (2017).
Which pathway of RRI are you addressing? Where should the pathway lead and why do you expect the pathway to happen?	Detailed description of the RRI pathways in focus.
Referring to the Grant Agreement, which kind of benefits (societal, economic, democratic, scientific)	All partners are recommended to think in depth about the possible benefits and make clear the benefits they expect to assess.

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[6] http://www.theoryofchange.org/pdf/DFID_ToC_Review_VogelV7.pdf

SUPER MoRRI case research project development protocol	
Question	**Content requested by the partners**
of RRI practices and policies do you expect in your study?	
Which kind of costs of RRI practices and policies do you expect in your study?	Cases should not only detect factors that support RRI, but also those which impede RRI activities and the realization of benefits. Those working on a case are required to reflect on possible costs of RRI practices and policies that were in focus of the case study.
How does the study produce knowledge relevant to the users?	Reflection on the relevance of the results and knowledge for possible users is crucial in order to, in the future, make best use of the results that are expected from the case studies.
Who implements the study? Who is involved? Which partners from the consortium are involved?	Partners should clarify in detail who is involved in which case, who takes over which tasks, etc.
How will it be implemented? Specific steps in order to complete the study. Flashing insight in steps, methods, resources needed…	Please describe in more detail the single steps and also the methods for the implementation.
Timing and resources	Partners should indicate a detailed time plan and the amount of resources they and possible collaborating consortium members would need for the implementation of the case study. This secures a planning of overall resources for WP5 as well as for single partners.

The detailed description of each case is included in the Annex (p.29) of this report.

3   RESEARCH PROJECT DESCRIPTIONS

This chapter provides an overall summary of the first wave of research projects to be conducted as part of WP5 in SUPER MoRRI. A concise description of each project is included in section 3.1. The fully developed protocol of each study is included as an Annex to this Deliverable (see Annex, p.29).

The following sub-chapter 3.2 includes an outline of dimensions addressed according to the objectives of WP5 (3.2 Summary of cases and dimensions, p. 24). This chapter concludes with a series of tables that summarise the projects in terms of a range of different characteristics and the distribution of research projects on dimensions of interest (3.3, p.27).

- Focus on RRI keys
- Focus on types of RRI benefits
- Focus on types of organisations/actors
- Level of analysis
- Geo-spatial scope
- Type of intervention studied
- Research methods used

3.1   Research project descriptions

3.1.1   Civil Society Organisations (CSO) at the science-society interface (CWTS)

This study will identify epistemological, political and institutional barriers that critical CSOs at the science-society interface experience when they engage with RRI related projects. It will analyse the barriers that occur when these actors seek to collaborate and engage with RPOs on RRI / SwafS related projects. The case study takes the problem into focus that CSOs often face a crisis of legitimation when they seek funding for research projects. This case study will provide detailed information on how CSOs are or are not included in RRI projects and RRI related work.

While the relevant dimensions of RRI depend partially on the CSOs that are selected, it is envisioned both PE and GOV to be the focal RRI dimensions.

The following benefits / impacts can be expected: (1) Relationships between RRI community and CSOs established; (2) legitimacy given to CSOs who are traditionally excluded from the boundary category of conducting research; (3) detailed information on the impacts that funding arrangements, those ostensibly supporting diverse and responsible research practices, have on CSOs conducting research.

3.1.2   Coding of ethics and values into autonomous systems (University of Bergen)

This study will focus on RPOs and will investigate efforts (in governance and research laboratories) to build ethics and values into autonomous (digital) systems. It will focus on how ethics in design is being implemented in practice, where and by whom. These developments are relevant to Super-MORRI since

they denote an important shift in the practice(s) of ethics within the RRI and Swafs ecosystems. This shift means both an enhanced role for ethics (since it enters into technological (ICTs) developments), and because it changes the practice of ethics (ethical values must be capable of being engineered). The field of values and ethics in design is really 'emerging', and generating quite some interest (such as: the IEEE's global initiative Ethically Aligned Design). It combines both RRI and ethics dimensions. The study will assess benefits and problems of ethics in design. It is presented to provide benefits that are: social (producing products that are more in line with people's values), democratic (introducing moral and ethical deliberation into designing and engineering), economic (producing an advantage for the internal market, since consumers will want solutions that are in line with fundamental values), and scientific (in the fields of software engineering and in ethics).

In actual practice it is likely that the main impact is in the policy domain, i.e. by the promise of ethical design becoming central to future agendas, such as the EU strategy for 'trustworthy AI'. It will also have an impact with regard to specific product developments, for instance robotics, where user-centric approaches are taken. Hence, various expert networks will be involved in soliciting and mapping out ethical issues as experienced by users. In contradistinction to classical ethics practices, the challenge is not so much of having a discussion about ethics and values, but about how to actually engineer and code values. This poses questions of its own, such as: can ethics really be coded in these ways?

3.1.3 Public value research careers (PVRC) (CSIC/Ingenio and CWTS)

This project focuses on the governance of research careers through the incentives and rewards institutionalised principally within RPOs and RFOs and will investigate how organisations can value responsible practices and researchers to better institutionalise "public value research careers". The goal is to understand the institutional variables and processes that provide opportunities – and present barriers - to re-configuring the 'script' of publicly funded research careers. The concept of a public value research career will be specified conceptually and empirically, building from the understanding that the research career is a mediating structure that links knowledge production to social structure. Transforming research careers to realise greater public value is mainly a governance challenge, in particular how do current governance arrangements set the rules of the game for researchers' engagement practices and what innovative practices should be supported if we wish to change these rules? It will also be important to understand the existing and perceived scope for concerted change; understood as transformation that integrates multiple institutional actors and interested stakeholders in some degree of coordinated action.

The governance challenge can be understood in two ways: (1) creating governance mechanisms for research careers that leads to careers being more strongly structured by 'external' social forces and less strongly by the 'internal' governance of knowledge production practices; (2) pluralising governance arrangements to permit and support greater heterogeneity within and between research career scripts. Monitoring opportunities that provide best-practice and process learning for transforming research career settings are expected and will be pursued through engagement with a diverse set of stakeholders.

Principally based on qualitative research, the study will use the CCN RPO and RFO studies to collect selected data points, will analyse policy and programme documents, will conduct an interview series with a variety of institutional actors, and will hold one stakeholder workshop with a diverse set of interested attendees. Stakeholders of interest include RFOs, RPOs, accreditation and evaluation agencies, associations for universities (EUA, Science Europe) and scientists (learned academies/alumni associations), career development agencies, employee unions and citizen science organisations. The assumptions and expectations of stakeholders regarding the expected societal benefits of enhanced public value research careers will be documented, as will the broad strategies and instrumental mechanisms that comprise their (explicit or implicit) strategies for change.

3.1.4   Creating knowledge for societal transformation: Transdisciplinary research (funding) in JPI climate

Climate change is one of the most pressing current global challenges. It will increasingly impact global societies at all levels and across sectors. Climate change modifies the way we live, consume, and generally engage in society. JPI Climate (Joint Programming Initiative "Connecting Climate Knowledge for Europe") believes that insights from across the Social Sciences and Humanities (SSH) community are necessary to enable and accelerate positive transformation in the face of climate change. (http://www.jpi-climate.eu/SOLSTICE). According to the SOLSTICE programme, participation of multiple actors should lead to: social justice and participation, sense making, cultural meaning and risk perception and transformative finance and economy.

This case seeks to find an answer to the question if a transnational and transdisciplinary call on societal transformation to mitigate climate change can lead to change in research and funding practices of RFOs and RPOs towards RRI. The project wants to investigate what these changes are and receive insights into societal, economic, democratic and scientific impact of these changes. There will be a focus on differences and similarities in different participating countries and different contexts.

Including RFOs, RPOs and also policy makers, the project addresses pathways that are downstream the implementation of RRI. In focus are the factors that lead to a transformation in research programmes (and thus funders), research project implementation (and thus consortia) and society through an integration of SSH and public participation in the whole process of knowledge production.

3.1.5   Gendered Eco-Innovations (Fraunhofer)

This case project focuses on the business sector and the key of Gender Equality (GE), because this key is still one of the top priorities of the EU (EC 2020). It will elaborate on the question of whether there is a link between gender equality and eco-innovations and if so, what the underlying mechanisms for this link are. There is descriptive evidence that gender diversity positively affects eco-innovations (Horbach & Jacob 2018) but the underlying mechanisms are not yet clear. The case study seeks to find such evidence in pathway sense but could ideally also help identify overall patterns of eco-innovations in Europe (in collaboration with the team from Ingenio). The Green Economy, as well as promoting GE,

are at the top of the EU agenda. This study seeks to investigate whether gender diversity can be used as a proxy for a general openness of companies towards societal needs and challenges. If so, the share of female inventors can be used to forecast an increased orientation towards the green economy objectives. Better economic performance in terms of turnover, patents etc. could result in economic benefits, but also societal (staff satisfaction) and democratic (better representation of women among staff and in decision-making positions). Furthermore, we expect scientific benefits through the delivery of new insights into pathways between gender diversity and eco-innovations.

3.1.6 *Alignment of preferences, practices, and repertoires in public engagement with science (Aarhus University)*

This case study of the first round will address the question: what are the academic and societal impacts of different implementation modes (specifically degrees of alignment between preferences, practices, and engagement repertoires) in the integration of researchers and citizens? Proponents of RRI tend to argue that alignment between societal needs and R&I, and in turn the legitimacy of the R&I system, depend on maximizing inclusivity and public engagement. The main hypothesis is that most important is not necessarily the absolute level of engagement, but rather the balance (or alignment) of mutual expectations. Additionally, the preference for engagement between scientists and citizens, and the balance/alignment between the preferred level of alignment and actual opportunities for and implementation of engagement, are important. Imbalances may lead to declining trust and deterioration of the cultural authority of science. Thus, the study expects that different implementation modes, specifically (mis-)alignment of preferences, practices and available engagement repertoires, will have implications for science (optimising societal robustness and relevance of knowledge products) and for society (cultural authority / legitimacy of science, indicated, e.g., by citizen trust in scientists and scientific institutions).

3.2 Summary of cases and dimensions

Overall, the distribution of research projects along dimensions of interest is quite comprehensive. In terms of the project development process it is apparent that:

- The studies illuminate both patterns of RRI implementation – which are a prerequisite for the generation of RRI benefits – and the subtle pathways from responsible practices to the emergence of different kinds of impacts and benefits of RRI. A key task of the case studies will be to identify valid data sources that could serve as replicable, responsible and sensible indicators for monitoring RRI.
- Pathways toward the societal, democratic, economic and scientific benefits are addressed to a variable extent.
- The project selection covers diverse actor groups: Research Performing Organisations (RPO), Research Funding Organisations (RFO), industry, Civil Society Organisations (CSOs) and policy makers.

- All key dimensions of RRI are covered to a differing degree. The SESL (Science Education Science Literacy) key dimension is the one least addressed in this first wave of WP5 studies. Consideration should be given to boosting attention to SESL in the second wave.
- Projects have a main focus on the meso level, but also cover the macro and micro level.
- The majority of studies will be implemented in countries that are connected to the consortium members (Austria, Denmark, Germany, Netherlands, Norway and Spain). Some studies may extend their scope more broadly in designing their study protocol, whilst others will also involve the European level (SWAFs, CCN – Country Correspondents Network).

The upcoming task 5.3 in WP5 will be devoted to efforts to clarify pathways from responsible practices to different kinds of impacts/benefits. We expect this first wave of research projects to be successful in generating new insights that contribute to an understanding of the interconnections of different types of RRI benefits. Pathways to benefits are not likely to be singular or mutually exclusive when the concepts involved, such as society and democracy, are so closely intertwined. With this in mind, the first set of projects developed in WP5 all address at least one benefit of RRI and all four types of benefits are covered across the WP5 research programme as a whole. SUPER MORRI's project duration of five years will also allow other innovative long-term monitoring of RRI implementation activities among diverse sets of actors through the SUPER MoRRI SwafS project eco-system (WP6/7) that is already operating, involving participation from several current territorial RRI projects. Insights from the SwafS eco-system may be particularly helpful in framing approaches to monitoring key institutional or organisational factors, which can support or impede RRI activities and pathways towards benefits, in ways that are strongly co-created by a constellation of relevant actors.

3.2.1   Selected cases and links to WP2 data vehicles

Figure 3 summarises the selected first wave of WP5 research projects and their connections to WP2 data vehicles. Although the timings of all elements of these empirical projects are shown as intended at the time of writing, the SARS-COV2/COVID 19 public health emergency means there will certainly be some adjustments to the timing of the planned studies.

Figure 3:   Summary of WP2 and WP5 empirical research activities
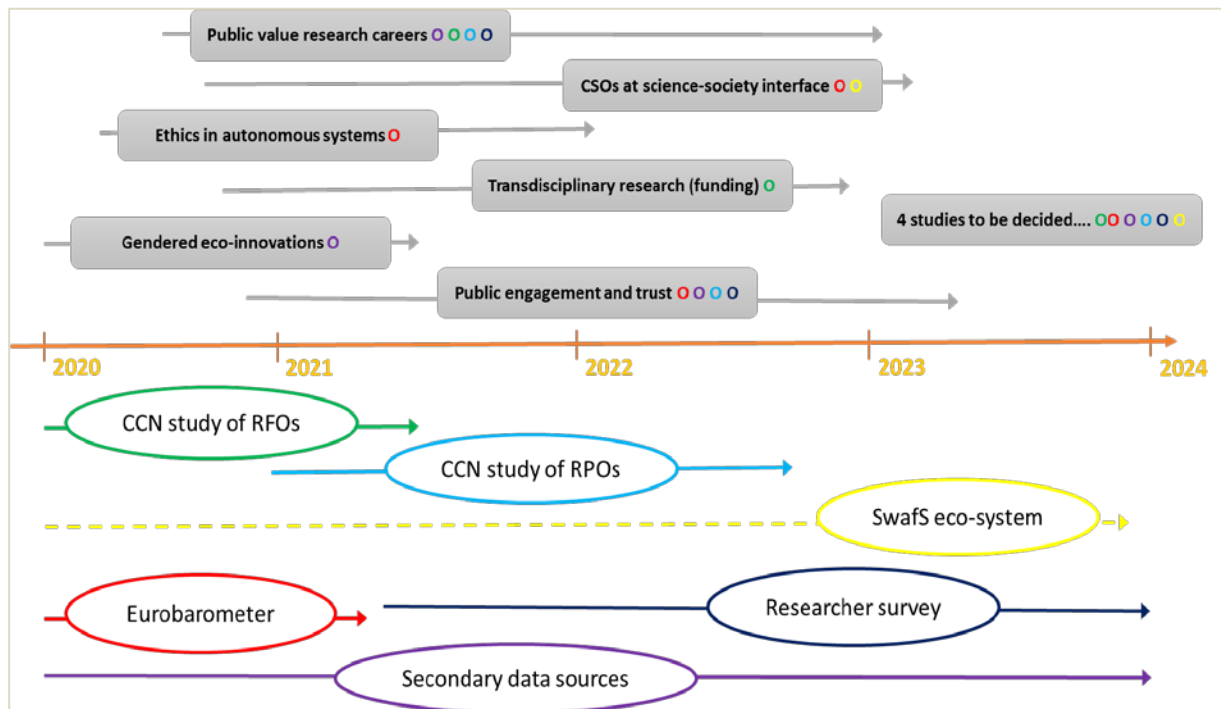
3.3 Distribution of research projects on dimensions of interest

The planned projects address a wide variety of dimensions of interest as depicted by the following summary charts.

Table 2 shows the coverage of all six key areas of RRI relative to the first wave of projects. The studies take the keys into account to a very different extent: e.g. the study on gendered eco-innovations focuses only the gender key (plus the theme of sustainability), the case on transdisciplinary research funding involves all keys except science literacy/science education.

Table 2: Keys addressed in the cases

Case Study	GE	ET	OA	SESL	PE	GOV
CSOs at Science-Society interface	x	x	x	x	X	X
Coding of ethics and values into autonomous systems		X				X
Public value research careers					X	X
Transdisciplinary Research (funding)	X	X	X		X	X
Gendered Eco-Innovation	X					x
Alignment of preferences, practices, and repertoires in public engagement with science					X	

Attention to pathways of RRI benefits and illustration of RRI patterns were fundamental dimensions driving the WP5 project development protocol. The first wave of WP5 studies is distributed across all four types of benefits. All studies expect to develop insights into pathways for multiple types of benefits, in various combinations (Table 3).

Table 3: Benefits addressed in the cases

Case Study	Societal	Democratic	Economic	Scientific
CSOs at Science-Society interface	X	X		
Coding of ethics and values into autonomous systems	X	X	X	X
Public value research careers	X	x	x	X
Transdisciplinary Research (funding)	x	x	x	x

Gendered Eco Innovation	X	X	X	X
Alignment of preferences, practices, and repertoires in public engagement with science	**X**			**X**

Each project will study the integration of a distinct constellation of diverse actors (Table 4). Research performing and funding organisations are most prominent. Industry is included in two cases, ethics in AI and the study on gendered eco-innovations. ´Policy makers´ are included in the study on transdiciplinary research funding and public value research careers. Addressing other stakeholder groups could be a goal of the second wave of WP5 studies, depending particularly on the outputs of the planned mid-point review within WP5.

Table 4: Main actor groups included in the cases

Case Study	RPOs	RFO	Industry	CSO/ citizens	Policy makers
CSOs at Science-Society interface	x			**X**	
Coding of ethics and values into autonomous systems	**X**	**X**	x		
Public value research careers	**X**	**X**			X
Transdisciplinary Research (funding)	X	X			X
Gendered Eco Innovation			X		
Alignment of preferences, practices, and repertoires in public engagement with science	X[7]			X	

Table 5 summarises the level of analysis of the projects. As decided in the development process, the meso level is the most prominent level addressed in the actual selection of cases, covered by five studies. This is consistent with the general aim of SUPER MoRRI, to focus more on the organisational than on individual or country level. Two cases (ethics in AI, transdisciplinary research funding) cover the micro level, and the case on public engagement and trust analyses data cover the macro-level, but

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[7] The main stakeholder group for this case are citizens, scientists and RPOs. For convenience reasons "scientists" are allocated to RPOs.

primarily based on micro-data. It is anticipated that these studies will generate particularly rich insights on processes.

Table 5: Levels addressed in the cases

Case Study	Micro	Meso	Macro
CSOs at Science-Society interface		X	
Coding of ethics and values into autonomous systems	X	X	
Public value research careers		X	
Transdisciplinary Research (funding)	X	X	
Gendered Eco Innovation		X	
Alignment of preferences, practices, and repertoires in public engagement with science	X		X

Regarding the countries involved in the projects, different numbers and selections of European member states are included (see Table 6). Some of the studies will elaborate the precise scope of their comparative dimensions (i.e. number of research sites in different countries or organisations) in designing their research protocols, which must of course make resource availability a primary consideration (e.g. public value research careers and gendered eco-innovations). Thought will be given to conducting some projects, for example transdisciplinary research funding, across a small selection of sites (2-4), e.g. across a selection of the SUPER MoRRI partner countries (3-6 sites). This may allow some limited mapping of patterns in combination with investigation of processes leading toward benefits. The combination of projects seems promising in its capacity to cover selected national comparisons as well as analyse patterns at the European level.

Table 6: Countries involved in the cases

Case Study	Countries
CSOs at Science-Society interface	The Netherlands, Spain / Catalonia & Norway
Coding of ethics and values into autonomous systems	Norway & Belgium, possibly the Netherlands
Public value research careers	Spain, European-wide (CCN study)

Transdisciplinary Research (funding)	Countries contributing to JPI-climate SOLSTICE call[8] with focus on 2-3 sites
Gendered Eco Innovation[9]	European-wide for quantitative data; Spain & Germany main background for qualitative data (plus additional countries when feasible)
Alignment of preferences, practices, and repertoires in public engagement with science	European-wide (Eurobarometer, CCN study)

A number of research projects conceptualise transformation in terms of particular types of systemic changes. These studies will analyse what types of monitoring data and information might be useful to support these transformations, including how these resources might vary according to the type of stakeholder/user.

Table 7 includes a summary on the variety of methods used in the case study programme. Primary data collection methods include surveys, interviews and ethnographic observations, amongst others. Secondary data sources such as the Eurobarometer will also be used.

Table 7: Methods used in the case study programme

Case Study	Methods used	Data sources
CSOs at Science-Society interface	Qualitative data (ethnographic observation, document analysis, interviews)	Align with Eurobarometer/PE study
Coding of ethics and values into autonomous systems	1) mapping of actors and networks (RFOs, RPOs, Swafs), 2) data collection through Eurobarometer and secondary sources, 3) interviews with select researchers identified in (1)	Eurobarometer and secondary sources; interviews
Public value research careers	Survey (qualitative) content analysis, interviews	WP2 (CCN RFO, CCN RPO, researcher survey)

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[8] Austria, Belgium, Czech Republic, Finland, France, Ireland, Italy, Latvia, Norway and the United Kingdom.

[9] The quantitative part will include all EU countries. The qualitative data assessment will be done in those countries that seem to be particularly active in eco-patenting, but cases included in this project will not be able to cover EU-27. As Fraunhofer and Ingenio/CSIC collaborating on the study, Spain and Germany will build the main background for some of the cases.

Transdisciplinary Research (funding)	Document analysis, qualitative interviews, focus group	Primary quantitative and qualitative data of RFO and RPO in the participating countries; CCN if applicable.
Gendered Eco-Innovation	Desk research, 20 cases based on interviews; analysis over countries	Secondary data (patents / inventors) and primary data (interviews)
Alignment of preferences, practices, and repertoires in public engagement with science	Statistical analyses / approaches to be decided; possibly cluster analyses	Eurobarometer, researcher survey, CCN study of RPO

4 FUTURE PLANNING OF WORK PACKAGE 5

The case research programme is set up to produce high quality scientific data and information, illuminate patterns of RRI activities, identify and describe pathways to RRI benefits, and contribute to the SUPER MoRRI framework for monitoring RRI. The timeframe involves different stages, including defining the research protocol for each study, field work and implementation, followed by analysis and results. These outputs will form the basis for a variety of contributions to the overall monitoring framework.

Within the upcoming phase of the SUPER MoRRI project, it will be the task of WP5 to oversee the elaboration of research designs and research protocols to be used in each study and to facilitate the necessary collaboration among partners on the implementing steps (task 5.1 is ongoing until M36). WP5 lead will provide all partners implementing projects with an analysis frame to develop a common approach to identifying and describing benefits of RRI and, most importantly, for identifying potential indicators and other outputs for the monitoring framework.

As can be seen in the overview of Table 8, cases are set-up for different timeframes. All cases have been planned to start in 2020, followed by an implementation phase lasting between one to three years. Year five (2023) of the SUPER MoRRI project is reserved for analysing data, synthesising results and compiling reports and definition of the overall framework.

Uncertainty about the scheduling in relation to SARS-COV2/COVID19 is unlikely to disappear quickly and connected delays are expected. Discussions are therefore underway regarding alternative delivery mechanisms, or research approaches for some of the studies. Despite this high uncertainty, no consideration has been given to curtailing the research programme, including in relation to the studies that will be prepared for the second wave of WP5 research projects.

Table 8: Time frame for implementation

Case Study	Start	End
CSOs at Science-Society interface	Autumn/winter 2020	End 2021
Coding of ethics and values into autonomous systems	Summer 2020	Mid 2021
Public value research careers	Autumn/winter 2020	Spring 2022
Transdisciplinary Research (funding)	Autumn/winter 2020	End 2022
Gendered Eco-Innovation	Autumn/winter 2020	Mid 2021
Alignment of preferences, practices, and repertoires in	Autumn/winter 2020	End 2022

public engagement with science		

A mid-point research review is scheduled to take place at the end of 2021. This should provide the possibility to analyse first results and make adjustments for the second phase of case study implementation and identify gaps in the overall strategic plan (see D1.2, p.21). To ensure that these gaps can be filled, not all case studies are defined at the current stage and resources have been withheld. By then, hopefully greater clarity will also be available regarding the impact of the COVID 19 public health emergency on future planning. The Work Package 5 core team meeting scheduled for month 20 (including the teams of IHS, FhG, UL, CSIC, AU) may also need to be re-scheduled depending on the rapidity with which the initial studies are a) able to commence, b) make up ground by potentially reducing their scope or using virtual methods.

In order to secure the consideration of the benefits, impacts and pathways towards RRI within the case studies and in alignment with WP1 and WP2, a structured process will be set up and planned. This should result in the presentation of various approaches how impact pathways and benefits could be analysed. Therefore, the exchange within the consortium on these topics will be fostered as well as external stakeholder consultation integrated.

Additionally, self-reflection of the involved partners („self-monitoring") and knowledge exchange between partners about interim experiences and results is seen as crucial for a successful implementation of, and as quality assurance for, the case research plan. The WP5 lead will secure and guide reflection and exchange between partners for the whole period of case research implementation. For this purpose, a certain amount of time will be reserved at consortium meetings and if personal exchange is not possible, collaborative reflection will take part virtually. Partners were, when planning their cases, required to reserve resources for these regular meetings and feedback loops and also for the final phase of analysis (year five).

Most of the cases will be finalised by mid/autumn of 2022, so that the majority of results can be included in D5.2, patterns study report, and D5.3, pathway studies report. By spring 2023 all case studies should be completed in order to do the final analysis and write up of the synthesis report D5.4 and the policy brief D5.5.

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ANNEX: CASE RESEARCH PROJECTS

CSOs at the Science-Society Interface (CWTS)

Research Question	RRI dimension	Main stakeholder group (RPO, RFO, HEI, CSO, industry, etc.)	Pathway or Patterns – upstream/ downstream	Benefit/Impact	Level of analysis (micro – meso – macro)	Methods used	Data sources
What political, epistemological, institutional barriers exist when critical CSOs at the science-society interface engage with RRI related projects? Further, which barriers exist when these organizations seek to collaborate and engage with academic institutions on RRI / SwafS related projects?	While the relevant dimensions depend partially on the CSOs that are selected, we envision both Public Engagement and Governance to be the focal dimensions.	CSO/ RPO/ RFO / HEI	Pathway – both, upstream and downstream	This study will provide detailed information into how Civil society organizations are or are not included within RRI projects and RRI related work. The following benefits / impacts can be expected. 1. Relationships between RRI community and CSOs established; 2. Legitimacy given to CSOs who are traditionally excluded from the boundary category of conducting research; 3. Detailed information on the impacts that funding arrangements ostensibly supporting diverse and responsible research practices have on CSOs conducting research.	meso	Qualitative data (ethnographic observation, document analysis, interviews)	Align with Eurobarometer/PE study to see potential continuities and discontinuities.

1. **Title**	CSOs at the Science-Society Interface
2. **Research Question**	What political, epistemological, institutional barriers exist when critical CSOs at the science-society interface engage with RRI related projects? Further, which barriers exist when these organizations seek to collaborate and engage with academic institutions on RRI / SwafS related projects?
3. Which current state of problem is the project seeking to influence? Why did you exactly choose this case?	After speaking with a CSO representative, it became evident that CSOs frequently face a legitimation crisis when seeking funding for research projects. This was even the case with grants that were RRI / SwafS related – highlighting that there is a risk that the lack of extending legitimacy to non-traditional research performing organizations (not universities, not private research organizations) may have the effect of reducing the impact that RRI could have in changing research practices.
4. Which **concept and definition of RRI** do you use in your case study?	
a) RRI concept used in the case	The concept of RRI that is used predominantly in the case is the procedural approach proposed by Stilgoe et al. However, the case will also be informed by the keys approach as a useful typology to structure the analysis.
b) RRI keys used in the case	In principle many RRI keys might be relevant, though this is partially contingent upon the selection of CSOs used as cases. Potential focal keys are Public Engagement and Governance.
4.b. 1) How are you going to operationalise the key(s) in focus?	The main key that will be focused upon within the case study will likely be public engagement, and governance (the development of governance around topics in research and innovation that may be controversial with respect to public perceptions and opinions), though this is slightly contingent upon the CSOs that are selected.

This is largely the case since many of the CSOs working at the science-society interface very explicitly work on ensuring broader participation of the public within the research and innovation system (such as providing the public with air-pollution sensors).

The notion of 'participation' will be operationalized within the case study through the detailed qualitative investigations into the different CSOs that |

	are being investigated. The qualitative work will involve assessing which 'publics' the CSOs are seeking to represent, include, and interact with within their work at the science-society interface, and how the perspectives of these publics can contribute to the governance of R&I.
	The ultimate aim of the operationalization of this key within this case is a more socially inclusive and oriented R&I system, which would include a more diverse set of non-scientific stakeholders and citizens than are currently able to contribute to the R&I system.
c) Definition of "RRI practices"	RRI practices include those which seek to ensure a more socially oriented research and innovation system. A more socially oriented R&I system would include a diverse set of non-scientific stakeholders and citizens in the R&I system engaging them during the whole R&I cycle, with clear responsibilities in tasks and roles.
	These include conducting research *with* concerned publics. This means that in cases where citizens will be impacted by research, they should be given the resources to help steer the research. There are various ways in which this 'steering' process could work. These include actively seeking to include concerned representatives of the public within the research (such as seeking out participation from local community organizations, requesting input from patient interest organizations into research activities, negotiating with employees within the energy production system for more equitable energy transitions in energy R&I, etc).
	Furthermore, the selected case studies will also have to have an influence on the governance of potentially contentious science-society topics, and how this can be improved through the inclusion of CSOs representing positions that may not typically be prominent within the research and innovation system.
4.c. 1) How are you going to operationalise the practices in focus?	The first level of operationalization will focus on the projects of the CSOs that we are following which will require investigating the following questions: How does public engagement take place, how are projects developed, which aspects of the science-society relationship do they focus on, how do CSOs work to influence the governance of research and innovation, how do CSOs interact and engage with funders, etc. This will require interviewing those working at the CSOs, analysing the mission statements of CSOs and their overlap (or mismatch) with funding calls, etc., and also exploring how perceptions of these CSOs are manifested in academia and within RFOs.

5. How will the **three-part model** of integration, implementation and impact (i3) defined in the strategic plan be integrated in your case/project?	
a) Integration:	Since our specific concern within the case study is understanding the kinds of barriers which exist for these CSOs when trying to work with RRI related projects, or attempt to acquire SwafS/RRI funding, ameliorating and investigating these barriers will be our main point of intervention within the case. These barriers are envisioned to be in the way of the integration of diverse perspectives within the R&I system. The barriers prevent CSOs, and by proxy the perspectives and forms of knowledge they contain, from being properly integrated within SwafS / RRI projects and funding streams. We want to focus on both of these kinds of benefits, however the latter (reducing the barriers restricting these CSOs' abilities to interact with RRI/SwafS projects or funding) will be our main focus.
b) Implementation:	Closely related to the description within the integration description, the CSO's selected must be working at the interaction space between how science and technology are being negotiated and implemented, and how that interacts with societal needs and expectations. Furthermore, by interviewing those working at CSOs, we will uncover challenges / good practices / common perceptions of CSOs, mismatches in priorities between RFOs and CSOs, etc.
c) Impact:	A main impact that we intend to have is a better understanding of the ways in which RRI / SwafS policies relate to CSOs that are working at the interface of technoscience and society in ways that aren't typical of research performing organizations. The impact of the RRI pathways that this case study expects to have involve a theory of change related to how the CSOs are able to influence the ways in which governance is developed to better suit the needs of diverse publics through their participation in RRI / SwafS projects. This is of course dependent upon the CSOs that are selected, but for example, a CSO focused on environmental concerns aims to take part in a study that would have otherwise consisted only of universities and industry, a perspective often left unattended to will then be included in the R&I processes. This would be

		a novel contribution considering that CSOs often represent capital (social and economic) deprived voices. This would result in a more democratic method of governance building through the involvement of representatives of these voices which would otherwise be excluded.
		We hypothesize that barriers exist which prevent policies from supporting these practices of such CSOs (due to a lack of formal legitimacy; due to a mismatch between the practices of the organizations and formal reward or incentive structure; due to a disconnect of values between the CSOs and RFOs / policymakers). We seek to provide a novel understanding of these barriers and to provide recommendations for RFOs, policymakers, and CSOs to bring attention to and remedy these barriers.
6)	Which **definition of change** do you use?	We expect that due to this case study, more will become known about how the various policy instruments which have been developed around SwafS and RRI might be 'closing down' particular forms of science-technology-society research and projects.
		We expect changes to eventually take place in two regards:
		1. CSOs will be given additional evidence to the claims that they may be systematically given less legitimacy than deserved – which may bolster their ability to engage with RRI / SwafS projects in the future, and
		2. RPOs and RFOs will become aware of the fact that there is an undue de-legitimation of CSOs inhibiting their ability to engage more actively with the research and innovation system.
		The narratives that this case study will predominantly use, as a backdrop of understanding, points A and C. This entails envisioning RRI as both a device to steer the development of R&I with more democratic, inclusive, and precautionary approaches (A), while simultaneously envisioning it as a means to more closely align the development of R&I with the needs of society (C).
a)	What changes do you expect to happen?	In terms of immediate changes, we envision several:
		- Documents to be given to RFOs and other actors within the space of writing RRI / SwafS related policies will inform them of what they have inscribed in policy means for actors working at CSOs, and whether or not certain forms of RRI / SwafS labour is being 'closed';
		- CSOs will be given additional legitimacy by being considered as part of the community of 'RRI' practitioners;
		- Through the additional information gleaned via this case study, RFOs and policy makers may adapt the visions of RRI they support and nourish;

		The SUPER MoRRI project will benefit from having the opportunity to engage with non-academic actors typically excluded from RRI / SwafS discourse.
7)	How will you consider **contextual factors** relevant for assessing pathways and impacts of RRI? (See also "*credible contextualisation*" in D1.2)	While the ways in which the term credible contextualization is described in the strategic plan were limited to forms of quantification, we argue that the term can be usefully extended to this case study by taking into account the broader political economy within which the case study is taking place.

This requires acknowledging the underlying structures which exist supporting or precluding the various activities performed at the CSOs, understanding that the lessons learned from the case are unable to be decontextualized and relocated to other contexts, and other assorted concerns relating to the need to take into account the contextual and particular nature of case studies as locally specific.

Where indicators may be developed or used throughout this case study, these will be done in partnership with the measured and monitored; further, the goals and ways in which evaluation can be shaped by the indicators will be negotiated openly with those who will be evaluated, rather than only in a hierarchical and top-down method. |
8)	How does the study contribute to **the monitoring framework (WP1)**?	This case study provides detailed qualitative data which is needed to support our understanding of how RPO and RFO policies and arrangements can serve to either inhibit or encourage these projects. This data provides information on how the implementation of policies to encourage RRI work occurs in practice within projects that feature collaboration between RPOs and CSOs.
9)	How is the study connected to the **implementation plan (WP2)**?	These partnerships exist in the milieu of institutional and funding arrangements that researchers and CSO employees navigate and work in. Since we want to see the mission statements, funding arrangements, and institutional forms of RPOs and RFOs, and how these interact with RRI related work, we must also attend to how these arrangements manifest themselves at the project level in the day to day experiences of those working in these atypical project environments which may not fit neatly in these arrangements.

We will select ideally 3 CSOs to investigate within this case study, although it may be likely that selecting fewer will be beneficial because it will give us additional depth for those selected cases. We will select a diverse set of |

	CSOs working towards different topics (for example, the environment, equitable technologies, etc.). Selection criteria will also include previously trying to acquire funding from calls relating to RRI / SwafS, or wanting to engage with projects that are related to SwafS / RRI. Since the case studies will include CSOs working on contentious science-society topics, and this is a focal point of the Eurobarometer, the findings of the two projects can usefully complement each other by showing potential (dis)continuities.
10) How does the study contribute to answer the **main question in WP5**: to understand better the pathways downstream of RRI practices and policies?	This study aims to understand how policies other permit or close certain forms of research and work within the relationship between science, technology, and society, with a specific interest on how CSOs and other non-traditional research performing organizations operate in this environment.
a) Which **pathway of RRI** are you addressing? Where should the pathway lead and why do you expect the pathway to happen?	The pathways that we envision being addresses within this case study include the pathways of creating a research and innovation system that is more inclusive of the perspectives that are found within critical CSOs working on science-society topics. This is closely related to both public engagement and governance: a more inclusive research system will be developed which engages more directly with diverse publics; the governance of the research and innovation system will benefit from being more closely influenced by the perspectives of critical CSOs.
b) Referring to the Grant Agreement, which **kind of benefits** (societal, economic, democratic, scientific) of RRI practices and policies do you expect in your study?	We see CSOs engaged in this environment as contributing to important democratic and societal benefits. By including their unique and frequently explicitly political perspectives in the research and innovation system, the system will include voices and ideas which otherwise would have been excluded. This results in a more inclusive and democratic research and innovation system. Furthermore, within the case study, we expect to find ways to remedy potential barriers that CSOs experience when trying to ensure that the voices they represent want to participate / engage with the R&I system. By situating this work within the policy and funding context, we can explore how to better improve institutional relationships between these

	organizations and the policy devices that seek to encourage RRI / SwafS integration within the R&I system.
	The particular benefits will of course be dependent on the particular CSOs included. For example, CSOs seeking to include the voices of the general public in how regional R&I projects can be more sustainable and participatory will necessarily have effects specific to the regions being engaged by the CSOs that are being investigated.
c) Which **kind of costs** of RRI practices and policies do you expect in your study?	RRI is a highly academic and bureaucratized policy device. We envision that the ways in which it has been manifest might prescribe very specific forms of valuation for research and innovation in the space of technoscience and society. We imagine that these prescriptions could be damaging for policy-academia-and CSO relationships. For example, if it is indeed the case that a lack of legitimacy is given to the CSOs, and they are persistently ignored by RFOs and RPOs who are working on related topics, they may become disaffected with the institutionalised research and innovation system and become more reluctant to engage in the future.
11) How does the study produce knowledge **relevant to the users**?	If RPOs and RFOs indeed have the goal of encouraging cross-sectoral collaboration to make a more socially responsive research system, then this data will provide insight into policies which are in place and how these policies manifest themselves during the implementation of these collaborations.
	This will inform RPOs and RFOs on how they may or may not be unwittingly or intentionally excluding CSOs from participating in their research efforts. Simultaneously, it may lend credence to claims by CSO representatives that they are experiencing this legitimation crisis and could help provide CSOs with evidence to bolster their credibility in the future.
12) **Who** implements the study? **Who is involved**? Which partners from the consortium are involved?	CWTS will take the lead, and we expect support in critical review in writing and theoretical development from Bergen and Ingenio (confirmed).
	The detailed distribution of resources is described in the answer to question 14.
	We think there is clear methodological expertise within Ingenio and UiB which would be of relevance to this case study. If the chosen object of study is a project on citizen science / perspectives of public engagement with science (which would be desirable), then there are clear parallels with AU's intention to exploit data from the Eurobarometer survey.

13) How will it be implemented? **Specific steps** in order to complete the study. Flashing insight in steps, methods, resources needed…	1. Identify projects between CSOs and researchers, thematically linked to RRI; 2. Request access and negotiate terms of reciprocally beneficial relationships with project members; 3. Participate and contribute to project in a reflexive manner while using the opportunity to collect qualitative data (document analysis, semi-structured interviews); 4. Align and triangulate with Eurobarometer/PE study Produce reports along with contributions from interested consortium members.
14) **Timing and resources**	Can begin immediately with the identification of suitable projects and CSOs. The preliminary identification of relevant CSOs can already begin in 2020, however the subsequent finalization of the case study(s) may depend on access to CSOs and the consequences of COVID-19. Duration of case study data collection can be negotiated, but all steps should not exceed 4PMs. The steps of the case study are the following: Month 1 – identify, contact, and research relevant CSO organizations and projects for the case study, background literature on CSO science society relationships. The CSOs will be located in the Netherlands, Spain / Catalonia, and Norway (CWTS) Months 2-3 – Conduct detailed qualitative research project (chosen methodologies contingent upon developments regarding access – for example COVID-19 related changes) on the chosen cases (CWTS) Month 4-4.5 – Analyze the outcomes of the cases and write subsequent summary of findings (potentially) with support in critical review from Bergen and/or Ingenio, on their own account which has been confirmed; writing to be done by CWTS.

Coding of ethics and values into autonomous systems (University of Bergen)

Research Question	RRI dimension	Main stakeholder group (RPO, RFO, HEI, CSO, industry, etc.)	Pathway or Patterns – upstream/downstream	Benefit/Impact[10]	Level of analysis (micro – meso – macro)	Methods used	Data sources
How is the programme, now emerging in many places, of designing and building ethics and values into autonomous systems, being implemented in practice? Where, how and by whom is it actually being implemented?	Ethics, governance	RFOs, RPOs	Pathway; upstream and downstream	**social:** by providing products that are more in line with people's values and expectations **democratic**: by introducing moral and ethical deliberation into the very process of designing and building an artefact / technology **economic:** it is claimed that this will produce an advantage for the internal market (esp. the digital IM), since customers will want solutions that are in line with fundamental values **scientific:** difficult to say. What science? It denotes a change in the field of (digital) ethics	Meso (plus micro)	1) mapping of actors and networks (RFOs, RPOs, Swafs), 2) data collection through Eurobarometer and secondary sources, 3) interviews with select researchers identified in (1), 4) overall analysis, drawing upon narrative structures of change (institutional and discursive level), and the sociology of translations (practice-level). These will be used to analyse the data emerging from 1, 2 and 3.	Eurobarometer and secondary sources; interviews

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[10] See questions 5 and 6

1. Title	Coding of ethics and values into autonomous systems (hereafter: ethics in design)	
2. **Research Question**.	How do programmes of designing and building ethics and values into autonomous systems bring changes to the interactions between ethicists and engineers?	
3. Which current state of problem is the project seeking to influence? Why did you exactly choose this case?	It denotes an important shift in the practice(s) of ethics within the RRI and Swafs ecosystems. This shift means both an enhanced role for ethics (since it enters into technological (ICTs) developments, and because it changes the practice of ethics (ethical values must be capable of being engineered). The field of values and ethics in design is really 'emerging', and generating quite some interest (such as: the IEEE's global initiative Ethically Aligned Design). It combines both RRI and ethics.	
4. Which **concept and definition of RRI** do you use in your case study?		
a) RRI concept used in the case	I rely on von Schomberg's concept, since it includes both 'process' and ethics. Ethics and values in design is a specific kind of process where ethics and values are translated into the making of a technological artefact: therefore this is implied in von Schomberg's definition (although it may not have been foreseen by him, it is a logical development of what he is saying).	
b) RRI keys used in the case	Ethics and Governance	
4.b. 1) How are you going to operationalise the key(s) in focus?	The case-study will take a relatively inclusive approach, including all types of cases that are said to focus on value-sensitive design, ethics-by-design, and machine ethics. These practices are clearly RRI-relevant, even if they are not specifically articulated as part of an RRI practice. We will give importance to the context being somehow concerned with 'governance': there is by now a vast literature claiming to do ethics by design or the like, but it is really quite academic (see the above link to the journal Science and Engineering Ethics). yet, design and values/ ethics based approaches are also moving into the	

	mainstream of governance (esp. of digital technologies). The point here is that the practices in question should not be merely theoretical, but moving into practice and governance, and hence also moving 'downstream'.
c) Definition of "RRI practices"	As research and innovation practice, this will take place in interactions between ethicists and engineers, that is, on the 'shop floor' and research laboratories. As governance this development is important as a way of making future pathways through inclusion and consideration of ethical issues. As stated in the previous section, the cases should ideally include both of these dimensions.
4.c. 1) How are you going to operationalise the practices in focus?	We shall make a simple 'before and after' mapping of language used (there is no time to study actual practices overtime). We shall pay special attention to what practitioners (engineers, ethicists) themselves are saying. This will be based on prior research into privacy by design. We have prior understanding of the field, but we are not sure how it plays out in the case of ethics, rather than law).
5. How will the **three-part model** of integration, implementation and impact (i3) defined in the strategic plan be integrated in your case/project?	
a) Integration:	Ethics and values in design require novel forms of collaboration, especially between ethicists and engineers, but also between users, policy makers, technology developers and others. It requires sensitivity towards values as intrinsic to the interests and worldviews of all such stakeholders.
b) Implementation:	This programme is still relatively novel, and the ways in which it is becoming implemented is part of the question we want to raise.
c) Impact:	Ethics in design is promised to have positive effects that are social (providing products that are more in line with people's values and expectations); **democratic** (introducing moral and ethical deliberation into the very process of designing and building technology); **economic** (it is claimed that this will produce an advantage for the internal market) **; scientific: (**It denotes a change in the field of digital ethics).

	In actual practice it is likely that the main impact is in the policy domain, i.e. by the promise of ethical design becoming central to future agendas, such as the EU strategy for 'trustworthy AI'. It will also have an impact with regard to specific product developments, such as for instance robotics, where user-centric approaches are taken. Hence, various expert networks will be involved in soliciting and mapping out ethical issues as experienced by users. The exact character of these impacts will depend on the product or technology domain.
6. Which **definition of change** do you use?	The proposed concept is to be understood at two interrelated levels: Firstly, in conjunction with distinctions introduced in D1.2 using the concept of **policy narratives**: especially according to policy narrative A (**'switching or re-directing the train** through processes such as co-creation'), since the aim is to regain control through design (a version of co-creation seen as more anticipatory and future-oriented than traditional ethics, since it deals with alignments of actors); on a policy level it also carries elements of narrative D (since it aims to put ethical values in the driver's seat of innovation). Secondly, In order to assess changes **at the level of actual practices** we will apply a version of the sociology of translations, and especially the concept of mediation, which is specifically concerned with the ways in which an object of design can be used for integrating the perspectives of variously positioned groups and professional practices (to be enrolled into the network of ethics by design). The question, then, becomes, firstly, how different actors adapt the language and practices of ethics by design (in a given context), and what actually happens as actual translations of ideas and concepts into a material artefact are undertaken (on a level of different practices and on a material-technological one). The sociology of translations assumes that 'design' is not a linear process, but that the object of design, i.e. the technology, also influences the conceptual level ('mediation'). This concept can be aligned with one of pathways, which will have to be elaborated somewhat more.
b) What changes do you expect to happen?	It will depend on the concrete cases under consideration. Based on prior research (on privacy by design) I expect material and practical changes, in cases that are really quite limited and well defined. The main (general, overarching) change may be at the level of promise and of agenda-setting, hence the policy-level.

7. How will you consider **contextual factors** relevant for assessing pathways and impacts of RRI?	Especially important are the professional boundaries, i.e. enablers and limitations inherent to variously implied practices, such as ethics and engineering (they operate with very different understandings and concepts). Also important will be the concrete technology in question, and main policy agendas and promises.
8. How does the study contribute to **the monitoring framework (WP1)**?	The case contributes by introducing an important policy domain that is poorly represented in Super-MORRI: one combining high ethics and RRI relevance with new and emerging technologies (ICTs). The field of values and ethics in design is really 'emerging', and generating quite some interest (such as: the IEEE's global initiative Ethically Aligned Design). It combines both RRI and ethics.
9. How is the study connected to the **implementation plan (WP2)**?	The proposed research is feasible when operationalised according to answers provided to question 4 b) and c), and when seen in the light of research already carried out (mainly dealing with privacy by design). Useful information can be gained from practices and plans in RFOs, in RPOs and the Swafs ecosystem, especially those dealing with emerging technologies / ICTs. This can be supported by a Researcher Survey to map perceptions and practices. Concerning Eurobarometer: ICTs, the Internet, security technology and privacy and recurrent themes. Secondary data sources: not sure, but some ethics data sources / indicators may be relevant.
10. How does the study contribute to answer the **main question in WP5**: to understand better the pathways downstream of RRI	By tracking a specific RRI practice (ethics in design), and the kinds of change entailed by it, downstream from policy agendas, in practice.

	practices and policies?	
a)	Which **pathway of RRI** are you addressing? Where should the pathway lead and why do you expect the pathway to happen?	The pathway is implied in Von Schomberg's emphasis on ethics and process, where design enters as a new stage in the integration of ethics into processes of digital innovation. It is already playing out through the upscaled attention to design and ethics (seen as integrated processes). Cases in point are the IEEE's (Institue for Electrical and Electronics Engineers) project of 'Ethically Aligned Design (a global initiative), in the legally mandated practice of privacy by design (GDPR, Art. 25), and in the ethics of 'Trustworthy AI' (an EU policy initiative to create the digital internal market in more ethically aligned ways). In terms of actual development pathways, we expect some very limited changes at the level of actual technological practices, whereas the main effect resides at the governance / policy levels, as creation of expectations that ethical issues will be deal with (in future)
b)	Referring to the Grant Agreement, which **kind of benefits** (societal, economic, democratic, scientific) of RRI practices and policies do you expect in your study?	**Social:** by providing products that are more in line with people's values and expectations **Democratic**: by introducing moral and ethical deliberation into the very process of designing and building an artefact / technology **Economic:** it is claimed that this will produce an advantage for the internal market (esp. the digital IM), since customers will want solutions that are in line with fundamental values **Scientific:** It is having an impact in the fields of software engineering, and in fields such as values-based design and privacy engineering.
c)	Which **kind of costs** of RRI practices and policies do you expect in your study?	They may be used to shortcut ethical and political deliberation (by saying that the problems have already been dealt with and implemented by the designers)
11.	How does the study produce knowledge **relevant to the users**?	It will centre on mapping of actors, networks and practices, in order to see how and to what extents these policies are being implemented. Hence it will provide an overview of a fast-emerging field of great interest to many RRI practitioners. This is especially relevant in the ICTs fields (such as Artificial Intelligence and ethics), where this is especially important. Hence, potential

	users of the generated knowledge will be RRI and ethics practitioners promoting concepts such as values in design, and ethically aligned design.
12. **Who** implements the study? **Who is involved**? Which partners from the consortium are involved?	University of Bergen is implementing the study. CWTS from Leiden is interested in participating and also has access to relevant scientific / engineering / ethics environments and projects. Due to limited resources in WP5 it was not clear at the time of writing this report if CWTS could collaborate with Bergen on the project or not.
13. How will it be implemented? **Specific steps** in order to complete the study. Flashing insight in steps, methods, resources needed…	1) mapping of actors and networks (RFOs, RPOs, Swafs), 2) data collection through Eurobarometer and secondary sources, 3) interviews with select researchers identified in (1), 4) overall analysis with a specific focus on integration of different data sources drawing upon narrative analysis and sociology of translations. Finally, these will be implemented into the Super-MORRI monitoring framework.
14. **Timing and resources**	All in all, 6 PMs months will be needed from University of Bergen, which is feasible but the work has to be scaled and shaped according to actual possibilities. If travelling is not possible, we shall do document studies and interviews by Skype /zoom / Teams. It is mainly a mapping exercise, combined with policy analysis, which will also be interpretative.
	We will not work full-time on this, so, realistically, we start in August 2020, and end in April 2021.

PVRC – Public value research careers (Ingenio / CSIC)

Research Question	RRI dimension	Main stakeholder group (RPO, RFO, HEI, CSO, industry, etc.)	Pathway or Patterns – upstream/downstream	Benefit/Impact	Level of analysis (micro – meso – macro)	Methods used	Data sources
How can organisations value and reward responsible practices and researchers to institutionalize public value research careers?	The research career is a mediating structure that links knowledge production to social structure. Transforming research careers to realise greater public value is mainly a governance challenge --- particularly how current governance arrangements set the rules of the game for researchers' engagement practices.	RPO, RFO, HEI associations	Process study, but with a comparative dimension to allow for learning about best practice. The study will investigate processes by which research careers are explicitly and implicitly governed. Plans or strategies that seek to modify research careers to generate greater public values will be indicators of pathways for transformation that can provide learning models.	This can be understood in two ways: 1) research careers that are more strongly structured by social forces and less strongly by the governance of knowledge production practices; 2) governance arrangements that permit and support greater heterogeneity in research careers.	Meso-micro	Interviews, (qualitative) content analysis, stakeholder co-creation activity, expert consultations.	WP 2 (CCN RFO, CCN RPO, researcher survey)

1. Title	Public value research careers
2. **Research Question**.	How can organisations value and reward responsible practices and researchers to institutionalise public value research careers?
3. Which current state of problem is the project seeking to influence? Why did you exactly choose this case?	Researcher careers mediate between the social and intellectual organisation of knowledge production and social structure. If the dispositions of researchers are increasingly structured by the stakes of non-academic fields and less by the rules of the academic game then this should have systemic benefits for society in comparison to the status quo.
	Currently the incentives and rewards that govern research careers tend to privilege careers that produce a narrow set of knowledge outputs, linked primarily to advancing frontier knowledge. Conversely there is a lack of incentives and rewards for research careers to be engaged in a broader range of activities that may realise increased public value. The governance of research careers involves multiple institutional dimensions, including employers, funders, disciplinary research communities, and evaluation systems. Although an increasingly consistent 'impact' discourse has sought to stimulate the achieving of societal benefits from research and the responsible metrics movement has sought to eliminate the most egregious 'performance measurement' practices shaping research careers, a systematic and multi-dimensional reforming of research governance is required. Public value research careers result from governance practices that support, recognise and reward engaged research that more strongly reflects the influence of social structures.
	The case was chosen as it addresses the set of governance arrangements that structure research careers relatively strongly in terms of professional requirements and relatively weakly in terms of social outcomes and expectations
4. Which **concept and definition of RRI** do you use in your case study?	I hope something like described in D1.2, p. 6-9.

a) RRI concept used in the case	The concept of governance in this case relates to the various ways in which researchers are assessed and evaluated, and what aspects of their work contribute to the career achievements: receiving funding; tenure; promotion; etc. Relatively responsible career governance does not limit itself to reductionist output metrics but rather recognise and reward public value contributions made by researchers/research careers. Public values are here understood as those values which structure non-academic fields, but are subjugated by narrow attention to the stakes of the academic game. This may include initially, for arguments sake, many of those already defined by Bozeman (which is a long list). Equality of opportunity, for example, is a public value. A major task for the project will be to understand how key institutional actors interpret public value from research and innovation.
b) RRI keys used in the case	Governance, engagement.
4.b. 1) How are you going to operationalise the key(s) in focus?	Engagement is operationalised by understanding how governance institutions (fail to) promote and reward integration and implementation of diverse actors in R&I. For example, funding decisions based on Journal Impact Factor, H-Index and previous grants are a failure from the PVRC point of view because they only value what is internal to the academic field.
c) Definition of "RRI practices"	Governance practices carried out by funders, employers, evaluators and colleagues that reward researchers for engaged research that involves non-academic partners and citizens, or for research designs that engage with societal uncertainties conjointly with scientific and technical uncertainties.
4.c. 1) How are you going to operationalise the practices in focus?	The detailed research plan will be developed in the study Protocol. The engagement practices that will be of particular interest will be those that institutional actors either a) point to, as how they reward engagement, or b) those they wish to reward, but as yet do not or cannot, and why this is. For example, do funders or employers reward researchers for sustained engagement with non-academic groups in designing research along their research trails, for the inclusion of citizen science designs in their projects, for undertaking gender content analysis, or for disseminating research to publics? How do they provide opportunities for researchers to influence funding decisions by promoting their practicing of such engaged activities? Do funders construct opportunities for team science roles (such as science communicators) to be rewarded in organisation career

	structures? Do funders recognise and reward Open Science practices? *How* do they do these things?	
	Or, alternatively, do funders rely on the H-index and Journal impact factor in making career shaping decisions? How can these narrow indicators best be expanded in their opinion?	
	A key question for PVRC is the identification of key engagement processes, procedures and practices that in the eyes of stakeholders would be beneficial for anchoring research careers more solidly in public value . Which do they consider are a priority for reform? The principles of transformation will be captured in the PVRC Charter. The real work of process transformation would be in the implementation of such a Charter, which would need to have flexibility to take account of national, sectoral and field characteristics.	
5. How will the **three-part model** of integration, implementation and impact (i3) defined in the strategic plan be integrated in your case/project?	The integration and implementation phases of engaged research are the object of governance practices. Current research on career governance places little value on integration with other actors or disciplines or on the development of research agendas that reflect societal as well as scientific uncertainties and challenges. This remains the case despite current emphases on missions and challenges in research funding, for example.	
a) Integration:	Refers to the diverse types of actors/knowledges researchers engaged with designing research and producing, translating and disseminating knowledge throughout their careers.	
b) Implementation:	Refers to the channels or modes of engagement, conjoint activities and translation mechanisms used by researchers throughout their careers.	
c) Impact:	Pre-conditions for public value research careers to realise societal benefits include recognition and reward for sustained engagement practices [a) and b) above].

The impact agenda is dual: 1) transformation in the research career as mediating structure between knowledge production and society; and 2) realisation of greater public value from a typical research career. | |
| | | |
| 6. Which **definition of change** do you use? | Transformations toward pluralism in governance practices that support contributions to public value that are not necessarily measurable as citations. | |

a)	What changes do you expect to happen?	The question is what changes do governance actors want/expect to happen. The change we are talking about could take 20 years and is never fully resolved. The need for concerted change presupposes the task of making explicit the strategies of the various actors.
7.	How will you consider **contextual factors** relevant for assessing pathways and impacts of RRI? (See also "*credible contextualisation*" in D1.2)	This is dependent on the empirical examples encountered. Not known at time of writing.
8.	How does the study contribute to **the monitoring framework (WP1)**?	Recognising and valuing responsible practices in the systems of hiring, funding, tenure, promotion, evaluation and rewards that shape science research careers. Strategic plan p. 15
9.	How is the study connected to the **implementation plan (WP2)**?	The project is a study of the coordination needed between RPOs, RFOs, and research communities (individuals, groups, disciplines) to value responsible practices in scientific work that can re-configure researcher's careers to enhance their public value. RFOs, RPOs and scientific communities have different but overlapping roles in the governance of research careers. This means that there are distinct considerations that need to be taken into account to assess how the public value of research careers can be enhanced through concerted change. This study will **shape** data collection in three SUPER MoRRI data vehicles (the CCN RFO study, the Researcher Survey and the CCN RPO study), by contributing to their design. It will then **use** data from three SUPER MoRRI data vehicles as part of its re-construction of the multidimensional governance of research careers.

10. How does the study contribute to answer the **main question in WP5**: to understand better the pathways downstream of RRI practices and policies?	The study is about the governance of scientific research and how it could be more responsible in the sense of rewarding engaged research. There may be some RRI-labelled practices and/or policies within the relevant governance mix, which would be nice to find and highlight, but not overly important for the study. Another way of saying this is that all processes that transform the governance of research careers in the ways described can be considered responsible/RRI, but attaching particular causal effects is probably not possible. Rather all such elements are seen as pre-conditions for transformations in the career archetype that will generate different downstream effects to what the current career model produces as its predominant downstream effects.
a) Which **pathway of RRI** are you addressing? Where should the pathway lead and why do you expect the pathway to happen?	The transformation of research career governance processes can be expected to diversify research careers and lead to the valuing of engaged practices, assumed to be a precondition (pathway) for scientific and societal benefits.
b) Referring to the Grant Agreement, which **kind of benefits** (societal, economic, democratic, scientific) of RRI practices and policies do you expect in your study?	Scientific benefits. Societal benefits.
c) Which **kind of costs** of RRI practices and policies do you expect in your study?	Resistance to change due to the argument that 'real scientists' are being undermined because criteria for valuing research career should be limited to 'objective measures of excellence', understood as citation metrics.
11. How does the study produce	The project will kick off with a Discussion Paper and end with a Policy Brief. The policy brief will be linked to a Charter for public value research careers.

knowledge **relevant to the users**?	A key output will be a European Charter for Public Value Research Careers. The project may try to develop a prototype of a Responsible Career Index at the organisational level, for possible inclusion as a beta-version in the SUPER MoRRI dashboard.
12. **Who** implements the study? **Who is involved**? Which partners from the consortium are involved?	INGENIO is leading the CCN RFOs data vehicle that will feed into the initial phase of the career study. Ingenio will design and organise the sampling frame, content analysis and interviews about responsible careers, with collaboration from Leiden/CWTS (potentially 1 month each to be spent on design and fieldwork, but this is not settled due to other competing demands that need to be respected). An important set of additional actors will be involved in the empirical phase of the project: career development agencies (e.g. Vitae), academic unions, post-doc/Phd associations, science academies, science organisations (e.g. LERU), science career experts (Laudel and Gläser, Bozeman)
13. How will it be implemented? **Specific steps** in order to complete the study. Flashing insight in steps, methods, resources needed…	Document/policy analysis of funders, employers, accreditation agencies, evaluators. Literature of relevant academic studies: e.g. University-industry collaboration surveys; research careers (INGENIO already has significant expertise and publications in these areas) Definition of the public value research career concept and its relevant dimensions. Empirical theme to be explored in CCN RFO study (led by INGENIO); this initial broad work will help in the development of a selection frame/typology to guide selection of key RFOs to approach for interviews on research careers. Drafting of the Discussion Paper (PVRC) Analysis of CCN RFO reports and interviews Interviews with stakeholder organisations Thematic data request CCN RPO study and Researcher survey Stakeholder event Combined analysis of Interview and relevant WP2 data Write policy brief and draft Charter

	Launch of Charter
	Try to design a tool for monitoring: PVRC index
	Write a journal article/hit the conference circuit
14. **Timing and resources**	Initial interaction with RFO study fieldwork, likely January-March 2021
	Preparation for PVRC fieldwork: March 2021-April 2021
	Interviews: May-August 2021
	Analysis and monitoring framework contribution development September-December 2021
	Launch of the Charter on April 1, 2022.
	The PMs are difficult to estimate and to account for. Ingenio has 10 person months dedicated to WP5. Approximately 6 person months could be dedicated to PVRC study.
	The method is variable in scope. For example, it might be possible to do one part of the study using the CCN and another part just within the project team. A multi-stakeholder co-creation event is desirable but could also be eliminated if insufficient resources are available.
	The study relies in part on multiple of the WP2 data vehicles and as such involves collaboration with Aarhus and with the leaders of each of the major empirical studies in WP2.

Creating knowledge for societal transformation: Transdisciplinary research (funding) in JPI climate (IHS)

Research Question	RRI dimension	Main stakeholder group (RPO, RFO, HEI, CSO, industry, etc.)	Pathway or Patterns – upstream/downstream	Benefit/Impact	Level of analysis (micro – meso – macro)	Methods used	Data sources
In which way does a transnational call on societal transformation on the topic of climate change with a focus on the SSH community lead to change in practices of RFOs and RPOs in different countries and different contexts?	Public engagement, governance, ethics (social justice)	RFO, RPO, policy makers	Pathway - downstream	Societal, democratic, economic, scientific	Meso	Interviews, document analysis, focus group, mini-survey	Primary quantitative and qualitative data of RFO and RPO in the participating countries; CCN if applicable

1. Title	Creating knowledge for societal transformation: Transdisciplinary research (funding) in JPI climate
2. **Research Question**.	Does a transnational and transdisciplinary call on societal transformation to mitigate climate change lead to change in research and funding practices of RFOs and RPOs in different countries and different contexts towards RRI? What are these changes? What is the societal, economic, democratic and scientific impact of these changes?
3. Which current state of problem is the project seeking to influence? Why did you exactly choose this case?	Climate change is one of the most pressing current global challenges. It will increasingly impact global societies at all levels and across sectors. Climate change modifies the way we live, consume, and generally engage in society. JPI Climate (Joint Programming Initiative "Connecting Climate Knowledge for Europe") believes insights from across the Social Sciences and Humanities (SSH) community are necessary to enable and accelerate positive transformation in the face of climate change. (http://www.jpi-climate.eu/SOLSTICE). The project call SOLSTICE, launched by the JPI Climate, is focusing on 3 topics: • Social justice and participation • Sense making, cultural meaning and risk perception • Transformative finance and economy We chose this case because 1. though JPI climate is not using the term RRI, its implementation and interdisciplinary approach (including different aspects of SSH) includes RRI aspects; 2. the funding programme provides an opportunity to look both at effects on RRI practices at RFO and RPO. 3. we want to study how trans-/interdisciplinary research can address one of the grand challenges of our time, 4. JPI Climate provides a cross country perspective, including several European countries (Austria, Belgium, Czech Republic, Finland, France, Ireland, Italy, Latvia, Norway and the United Kingdom).
4. Which **concept and definition of RRI** do you use in your case study?	• On the one hand we want to look at which key dimensions are included in the call, the funded projects and the implementation. In the call "public participation" and "governance and agency in societal transformation" are a prerequisite, other keys are not named explicitly but are expected to be included as well. • Further, we refer to von Schomberg´s definition, as in the JPI climate there is a call for a "transformative finance and economy" and addressing climate change as a ´grand societal challenge´ in a different way than it used to be.

	• Regarding the concept of Owen, Macnaghten and Stilgoe, within the thematic area 2, "Operationalising visions and scenarios for transformative change", "anticipation science" is named as one key term. There we expect to find insights on whether and how *reflection, inclusion and responsiveness* are included in the implementation.
a) RRI concept used in the case	See above
b) RRI keys used in the case	PE: how is the public included in environmental impact assessments, decision-making and societal change regarding climate change; how are different stakeholder groups in different collective decision-making processes and areas of knowledge (grassroot knowledge), how are socio-economically disadvantaged and vulnerable populations and groups included in the projects being implemented. Further, participation can be defined as degrees of participation from different disciplines. As defined by the White paper from JPI climate, "participation can be addressed from two different perspectives, firstly as an issue of democratic decision making (stock taking) and secondly from the perspective of social justice, fair distribution, and social equity" (p.7). ET: how are ethical considerations regarding climate change mitigation and adaptation integrated in the projects (research integrity); how are effects of climate policies evaluated in regard to their moral and ethical values (ethical acceptability; science and society) GOV: arrangements that lead to acceptable and desirable futures have to (1) be robust and adaptable to the unpredictable development of R&I (de facto governance); (2) be familiar enough to align with existing practices in R&I; (3) share responsibility and accountability among all actors; and (4) provide governance instruments to actually foster this shared responsibility.
4.b. 1) How are you going to operationalise the key(s) in focus?	PE: diversity of research consortia and degree of inclusion in project implementation (e.g. if consortia and projects include CSOs or other stakeholder groups not directly related to RPOs); diffusion of responsibility amongst different types of consortium partners, existing rewards for participation/inclusion of various types of stakeholders; inclusion in different stages of the process (from designing the project, definition of research questions and implementation of activities)

	ET: integration of ethical aspects in various stages of the design of the research programme and implementation process of projects; influences on science and society of the projects, ethical acceptability of implemented measures GOV: degree of share of responsibility amongst all actors, provision of governance instruments to actually foster this shared responsibility; amount of degrees of freedom in the project implementation (learning by doing, allow a culture of failure for learning and knowledge creation)
c) Definition of "RRI practices"	We want to have a look on whether the call for a transnational integration of SSH would lead to research practices that are in the line with not only the six keys, but also with the *process dimensions* RRI can be defined with. We expect to be confronted with practices of RRI like establishment of inter/transdisciplinary research consortia, including the public and a wide variety of stakeholders in various stages of the research process, taking into account ethical considerations, etc. A closer investigation of relevant practices will be part of the research process of the case project.
4.c. 1) How are you going to operationalise the practices in focus?	Some examples: • Taking into account the different steps from design of the research programme (e.g. how inclusive is the programme, which criteria are needed to be addressed for successful funding; and further: which decision making processes are necessary for setting up a transdisciplinary call) to implementation (e.g. at which stage of the process participation of the public and other stakeholders takes place). • Are ethical considerations already included in the 1) design of the call, 2) the project proposals and/or the 3) implementation of the project and to which extent. We expect to receive a clearer vision of the practices to operationalise after the first phase of the project (document analysis).
5. How will the **three-part model** of integration, implementation and impact (i3) defined in the strategic plan be	

integrated in your case/project?	
a) Integration:	How are different actors/knowledge sources/disciplines/stakeholders/organisations integrated in the (1) design of the work progamme and call (2) project proposals AND in the (3) implementation of the funded projects.
b) Implementation:	In a first step, we will have a look on the goals, implementation and experiences funders have when setting up a transnational call: which objectives they pursue, which experiences do funders have when setting up a call and selecting projects for funding (after which criteria etc.) and implementation; which experiences do they have when projects are implemented?
	In a second step we will select 1-2 projects in order to validate the results from the perspectives of funders: how are consortia and organisations coping with the requirements set by the call; how do projects and organisations integrate and implement RRI (practices) and to what extent.
c) Impact:	We will study whether the design and implementation of the research programme and projects respectively will make a difference for RFOs and RPOs in how they operate and in what way.
6. Which **definition of change** do you use?	
a) What changes do you expect to happen?	Change in funding and research practices towards a stronger emphasis on RRI keys and principles (RRI process and key dimensions, responsible research practices).
7. How will you consider **contextual factors** relevant for assessing pathways and impacts of RRI? (See also "*credible*	We consider all factors relevant that refer to inclusive, effective, democratic and sustainable societal transformation processes and outcomes within and beyond Europe, so factors that also have a policy relevance (see also *science with and for society*). Special focus will be laid on factors that influence the science - society relationship but also general factors that are prominent for the actual research system (e.g. publication strategies, rewarding system, etc.).

contextualisation" in D1.2)	
8. How does the study contribute to **the monitoring framework (WP1)**?	The JPI climate promotes inter-and transdisciplinary research as well as innovative and participatory approaches and it seeks to enable cross-border research and increase the science-practice interaction. Furthermore, it involves all societal actors. The project thus contributes to the monitoring framework in the sense that it looks on RRI (like) practices from a different angle. Further, it will assess the perspective of research funders on designing and implementing a research program with the above mentioned characteristics.
9. How is the study connected to the **implementation plan (WP2)**?	The data collection in the study could be connected to the CCN study for RFOs and RPOs. Data on contextual factors related to the research system of countries involved in the JPI climate programme will be used in order to create a bigger picture of enabling and inhibiting factors for inter/transdisciplinary research programmes and pathways for RRI in this respect.
10. How does the study contribute to answer the **main question in WP5**: to understand better the pathways downstream of RRI practices and policies?	By taking on a long-term perspective on the development of a funding programme that tries to instigate societal transformation, pathways of downstream implementation of RRI will become visible.
a) Which pathway of RRI are you addressing? Where should the pathway lead and why do you expect the pathway to happen?	We address pathways that are downstream the implementation of RRI. In focus are the factors that lead to a transformation in research programmes (and thus funders), research project implementation (and thus consortia) and society through an integration of SSH and public participation in the whole process of knowledge production.

		According to the SOLSTICE programme this should lead to: social justice and participation, sense making, cultural meaning and risk perception and transformative finance and economy. Thus, all benefits of RRI should be addressed.
b)	Referring to the Grant Agreement, which **kind of benefits** (societal, economic, democratic, scientific) of RRI practices and policies do you expect in your study?	Societal, economic, democratic, scientific
c)	Which **kind of costs** of RRI practices and policies do you expect in your study?	Costs of participation, costs of transdisciplinary research (e.g. finding a shared language), missed credits in the standard rewarding system (publishing in less prestigious journals with less impact, lacking rewarding for involvement of public and other stakeholder groups)
11.	How does the study produce knowledge **relevant to the users**?	RFOs: to assess their experiences with the design of the program, the design of the call and the implementation of the projcts, comparison over different countries RPOs: assess the expectations within the new call and how they plan and implement it, learn for future collaborations in the same environment
12.	**Who** implements the study? **Who is involved**? Which partners from the consortium are involved?	From consortium: Potentially, Uni Bergen for Norway (this depends on the projects that will be finally funded over the programme; decisions on funding is expected for end of May 2020). CCN: Austria, Belgium, Czech Republic, Finland, France, Ireland, Italy, Latvia, Norway and the UK
13.	How will it be implemented? **Specific steps** in order to complete the study. Flashing insight in steps, methods, resources needed…	The first step will be to approach the JPI secretary (Dr. Frank McGovern, the Chair of JPI Climate) and create contact to the JPI network and receive access to necessary data and contacts to research partners/consortia. In a second step, document analysis of programme call related documents and proposals of funded projects will give a first overview of aspects that are integrated in the ideas of JPI climate and related to generating RRI pathways and impacts. Based on this, interviews with

	funders and researchers will help to get a deeper understanding of goals and development of the programme design and implementation of projects. In addition to this, mini-surveys will help to assess patterns that are related to impacts and benefits of RRI. 1-2 focus groups with researchers working on projects in the programme will supplement already existing knowledge and create a bigger picture. In the beginning, a well-targeted 3-year plan will be set up for planning, implementation and analysis and synchronisation with activities of the funded projects within SOLSTICE and the strategic as well as implementation plan of SUPER MoRRI.
14. **Timing and resources**	Start: get in contact right away Make 3 rounds (projects within the SOLSTICE programme will start in autumn 2020 and will be funded for 2-3 years): 1. autumn 2020 2. autumn 2021 3. autumn 2022 Resources: app. 6 PM for IHS, 0,5-1 PM for UiB

Gendered Eco-Innovations (Fraunhofer)

Research Question	RRI dimension	Main stakeholder group (RPO, RFO, HEI, CSO, industry, etc.)	Pathway or Patterns – upstream/downstream	Benefit/Impact	Level of analysis (micro – meso – macro)	Methods used	Data sources
Is there a link between gender equality and eco-innovation and if so what are the underlying mechanisms for this link? Eco-innovations reflect the corporate responsibility towards the future and the environment. They also refer to sustainability which is, according to the researchers survey, an important RRI dimension even if not covered by the three existing conceptualisations of RRI	Gender Equality (GE), because GE is still one of the top priorities of the EU (see "A Union of Equality: Gender Equality Strategy 2020-2025"). We define gender equality as the act of treating women and men equally which is, particularly in R&I systems, not yet fully guaranteed	Industry (private sector)	The case study covers both pattern and pathways but the latter are in the focus. Patterns are used to identify the spread of eco-innovation across Europe (measured by patents) but primarily we intend to investigate the upstream pathways that emerge from a better GE balance in companies and patented eco-innovations	The Green Economy as well as promoting GE are at the top of the EU agenda. We want to investigate whether gender diversity can be used as a proxy for a general openness of companies towards societal needs and challenges. If so, the share of female inventors can be used to forecast an increased orientation towards the green economy objectives	Meso	Desk research, 20 cases based on interviews; analysis over countries	Secondary data (patents / inventors) and primary data (interviews)

1. **Title**	Gendered eco-innovations
2. **Research Question**.	Is there a link between gender equality and eco-innovations and if so, what are the underlying mechanisms for this link?
3. Which current state of problem is the project seeking to influence? Why did you exactly choose this case?	There is descriptive evidence that gender diversity positively affects eco-innovations[11] but the underlying mechanisms are not yet clear. The case study seeks to find such evidence in a sense of a pathway but could ideally also allow identification of overall patterns of eco-innovations in Europe (in collaboration with the team from Ingenio/CSIC)
4. Which **concept and definition of RRI** do you use in your case study?	
a) RRI concept used in the case	One of the surprising results that emerged from the researchers' survey was the fact that 55% of the respondents associated "sustainability" as an important term that they associate with the concept of RRI. This was the second important category. Beside this, we refer indeed to the EC conception of RRI and its six keys.
b) RRI keys used in the case	We focus on the RRI key gender equality because it is very high on the EU agenda, as well as covered by the SDGs and because there are still gender-based gaps in the research and innovation systems. Our starting point is conceiving gender as the socially constructed roles, behaviours, activities and attributes that a given society considers appropriate for women and men (see Article 3(c) of the Council of Europe Convention on preventing and combating violence against women and domestic violence). However, we fully acknowledge the relevance of intersectionality in terms of age, ethnicity and religion.
4.b. 1) How are you going to operationalise the key(s) in focus?	We operationalise GE as the share of women among the staff and in decision-making positions. Furthermore, we will develop and apply a gender disambiguation algorithm that will enable us to identify female inventors via their first name in the greentech database (GTDB) (www.greentechdatabase.com).Consideration can also be given to

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[11] see Horbach, J., & Jacob, J. (2018). The relevance of personal characteristics and gender diversity for (eco-) innovation activities at the firm-level. Results from a linked employer-employee database in Germany. Business Strategy and The Environment, 27(7), pp. 924–934)

		analysing links between inventor gender and gender analysis in patent descriptions, as has been done for some fields of academic publishing (Nielsen et al. 2017).
c)	Definition of "RRI practices"	RRI practices here mean effective strategies to promote gender equality, a practiced responsibility toward environmental concerns and a general openness towards societal needs are in place. For this purpose ,we will investigate whether the RRI practices are reflected in the existing incentive structures like KPIs, mission statements and the organisational structure, e.g. the existence of persons / unit in charge etc.
4.c. 1) How are you going to operationalise the practices in focus?		The operationalisation will be delivered as soon as the case study starts because this will be part of the research process itself (and will be team-based).
5.	How will the **three-part model** of integration, implementation and impact (i3) defined in the strategic plan be integrated in your case/project?	
a)	Integration:	Given the current under-representation of women in research and science systems, and in the business sector in particular, this case study will investigate successful strategies to recruit, retain and advance women. The main point of reference is the company staff.
b)	Implementation:	Here we investigate whether the practices in place are themselves being negotiated in a transparent, open and inclusive way
c)	Impact:	Impacts are key to this case study because we investigate how gender equality leads to more eco-innovations and how diversity leads to new processes, capacities and attitudes for addressing ecological and sustainability issues more broadly. It is worthwhile to mention, however, we do not claim causality and or attribution, but rather for contribution, taking non-linearity of innovation processes as well as context factors into account.
6)	Which **definition of change** do you use?	We investigate changes in the strategic orientation (measured as self-reports from HR people and decision-makers) as well as performance in terms of patents for eco-innovations of selected companies.

a)	What changes do you expect to happen?	We expect companies to be more responsible (societal, environmental, internal, external) if they show a higher degree of diversity among their staff and in decision-making positions. We will base our definition of responsibility on existing concepts of CSR (Corporate Social Responsibility), Corporate Citizenship (CC) and results from H2020 project on industrial RRI.
7)	How will you consider **contextual factors** relevant for assessing pathways and impacts of RRI? (See also "*credible contextualisation*" in D1.2)	Important context factors are the national gender welfare regimes, national gender equality and labour market policies, the overall strengths and weaknesses of the innovation systems (for example, diversity of R&I actors, R&I expenses, share of public and private funding, inclusiveness of the R&I systems) particularly in regards to the role of the business sector and R&I expenses.
8)	How does the study contribute to **the monitoring framework (WP1)**?	Input to the third monitoring report. The results could be used for the monitoring framework by showing the patterns and trends of female inventors in specific sub-fields that relate to eco-innovations.
9)	How is the study connected to the **implementation plan (WP2)**?	This proposal addresses a gap as it refers to the private sector and impact of at least one RRI key (gender equality). The implementation plan foresees patent data and only needs to be complemented by a gender dimension (gender of the inventors, for example). When using some combination of gender of the inventor, geo-localisation and patenting category on the one hand, and text-mining the patent abstracts on the other, this will potentially lead to one or two indicators for the monitoring framework. These indicators will potentially contribute to monitoring for the theme of sustainability in the framework (Super Morri Strategic Plan, section 3.4.2) and to monitoring along the gender key.

10) How does the study contribute to answer the **main question in WP5**: to understand better the pathways downstream of RRI practices and policies?	Numerous studies indicate the **"business case"**, i.e. the benefit that can be generated if more women are represented in companies, at top level but also within the different working units. What is still less studied, however, is the link between gender diversity and eco-innovations. However, in complex settings like R&I systems, it is hardly possible to establish causal links between a phenomenon (level of gender diversity) and environmental and social effects. Instead, what we can deliver are some sort of plausible links based on theory-based evaluation approach.
a) Which **pathway of RRI** are you addressing? Where should the pathway lead and why do you expect the pathway to happen?	The pathway is that gender diversity increases the variety of attitudes and behaviour, thus practice, which in turn will have effects on organisational strategies and finally, outcomes.
b) Referring to the Grant Agreement, which **kind of benefits** (societal, economic, democratic, scientific) of RRI practices and policies do you expect in your study?	Economic benefits: better economic performance in terms of turnover, patents etc., but also societal (staff satisfaction) and democratic (better representation of women among staff and in decision-making positions). Furthermore, we expect scientific benefits through delivering new insights into pathways between gender diversity and eco-innovations. Scientific benefits: a patterns-type paper about the link between the gender of the inventor, geography of innovation, patenting category and the gender content of patent abstracts analysed by text-mining. Societal benefits: the results will establish geo-spatial and gendered patterns of innovation that support sustainability in energy and other technology driven activities and sectors.
c) Which **kind of costs** of RRI practices and policies do you expect in your study?	Within-team conflicts - resistance and power struggles are further examples for potential costs.
11) How does the study produce knowledge **relevant to the users**?	Relevant knowledge: Link between economic and environmental benefits and gender equality.

	Users: Policy makers, Corporate management (reflection of corporate strategies), academia. They can use the study results, codified through reports, articles and factsheets, at least as an inspiration for further policy measures to promote gender equality and green economy (policy), and a reflection of HR strategies (corporate management). Academia might be interested because the underlying pathway for the assumed effect of gender equality / diversity is not yet understood (gender should be seen only as a proxy but not the cause)
12) **Who** implements the study? **Who is involved**? Which partners from the consortium are involved?	Fraunhofer as well as INGENIO will implement the case study whereas the focus of Fraunhofer will consist in the qualitative interview work within the identified companies and Ingenio's focus on its database, which is geo-coded by the fields and sub-fields of eco-patenting and by inventor. INGENIO will initially develop and implement and algorithm for the gender coding of inventors. A second step will be to explore the possibility of automatic exploration of gender content, or to prepare a stratified sample of patents for manual analysis and coding (depending on resources).
13) How will it be implemented? **Specific steps** in order to complete the study. Flashing insight in steps, methods, resources needed…	1. Identify patterns of eco-innovations via patent analysis based on respective classification systems and EU patents (own in-house database of INGENIO, Patstat), with a special emphasis on the geo-spatial location and fields of patent families of female inventors. 2. Identify companies owning eco-patents EU wide and based on the inventor's affiliations - as mentioned above, based on Patstat 3. Mapping a selection of female inventors with the companies owning and exploiting patents on their inventions. 3. Conduct qualitative case studies (20) in these companies based on interviews, taking into consideration a matrix of female inventors, geo-location and patent owners (firms). 4. Cross-cutting analysis of patterns and determinants for eco-innovations under a gender-perspective across different countries, where we find the majority of patent applications in the field of eco-innovations 5. Final results, conclusions and recommendations

D5.1

14) **Timing and resources**	2020 Start date: 9/2020, end date: 6/2021, resources for Fraunhofer: 3-4 PM, for other colleagues (Ingenio?) 1-2

Alignment of preferences, practices, and repertoires in public engagement with science (Aarhus University)

Research Question	RRI dimension	Main stakeholder group (RPO, RFO, HEI, CSO, industry, etc.)	Pathway or Patterns – upstream/downstream	Benefit/Impact	Level of analysis (micro – meso – macro)	Methods used	Data sources
What are the academic and societal impacts of different implementation modes (specifically degrees of alignment of preferences, practices, and engagement repertoires) in the integration of researchers and citizens?	Public Engagement	Citizens, researchers, RPOs	Pattern; downstream	We expect that different implementation modes, specifically (mis-)alignment of preferences, practices and available engagement repertoires, will have implications for science (optimising societal robustness and relevance of knowledge products) and for society (cultural authority / legitimacy of science, indicated, e.g., by citizen trust in scientists and scientific institutions)	Analyses primarily at macro-level (countries / regions) but primarily based on micro-data	Statistical analyses / approaches to be decided. Possibly cluster analyses	Eurobarometer, researcher survey, CCN study of RPOs The study depends on coordination between these elements (e.g. same items used in both Eurobarometer and researcher survey)

1. Title		Alignment of preferences, practices, and repertoires in public engagement with science
2.	**Research Question**.	The overall research question (fitted to the i3 model) is: - What are the impacts (academic and societal) of different implementation modes (specifically degrees of alignment of preferences, practices, and engagement repertoires) in the integration of researchers and citizens? The following sub-questions will be explored: - Are citizens' preference for engagement aligned with their actual level of engagement? - Are researchers' preference for engagement aligned with their actual practices? - Are citizens' and researchers' preferences and practices concerning engagement aligned? - Are RPOs' priorities and practices concerning engagement and outreach – what we could call the engagement repertoires they employ – aligned with the needs of researchers and citizens? Is better alignment between societal needs and R&I and the democratic legitimacy of science reached by (simply) maximizing inclusivity and public engagement?
3. Which current state of problem is the project seeking to influence? Why did you exactly choose this case?		Proponents of RRI tend to argue that alignment between societal needs and R&I and the legitimacy of the R&I system depends on maximizing inclusivity and public engagement. Our hypothesis is that it is not necessarily the absolute level of engagement but the balance (or alignment) of mutual expectations and the preferences for engagement between scientists and citizens and the balance/alignment between the preferred level of alignment and actual opportunities for and implementation of engagement that matter. Imbalances may lead to declining trust and deterioration of the cultural authority of science
4. Which **concept and definition of RRI** do you use in your case study?		In the case study:

a) RRI concept used in the case	We combine elements from each of the three conceptualisations described in the strategic plan.
	1) We look at the 'key' dimension of Public Engagement
	2) We look at interaction and mutual responsiveness (von Schomberg) and particularly emphasise the notion of 'alignment'
	3) We look at the dimensions of inclusion and responsiveness (Stilgoe et al)
b) RRI keys used in the case	Public Engagement
4.b. 1) How are you going to operationalise the key(s) in focus?	We will tap into researcher's perceptions and practices using the researcher survey. Specific items to capture engagement have not been decided yet, but will be partly informed by items used in the MoRRI researcher survey and significantly by the items used in Eurobarometers in order to gauge the alignment of researcher and citizen positions. Organisational PE repertoires will be examined in the CCN RPO study, but specific operationalisation has not been decided yet. Finally, public practices and preferences are operationalised using the range of items of engagement, trust, and efficacy in the 2020 Eurobarometer.
c) Definition of "RRI practices"	In terms of practices, we examine: 1) Citizens' preferred and enacted engagement practices, from horizontal engagement in information seeking and dissemination to vertical engagement in science policy and decision making 2) Researchers' preferred and enacted engagement practices (cf. MoRRI researcher survey – plus new elements and importing of Qs from the Eurobarometer survey 3) Strategies, priorities, practices aimed at public engagement at RPOs
4.c. 1) How are you going to operationalise the practices in focus?	We will tap into researcher's perceptions and practices using the researcher survey. Specific items to capture engagement have not been decided yet, but will be partly informed by items used in the MoRRI researcher survey and significantly by the items used in Eurobarometers in order to gauge the alignment of researcher and citizen positions. Organisational PE repertoires will be examined in the CCN RPO study, but specific operationalisation has not been decided yet. Finally, public practices and preferences are operationalised using the range of items of engagement, trust, and efficacy in the 2020 Eurobarometer.

5.	How will the **three-part model** of integration, implementation and impact (i3) defined in the strategic plan be integrated in your case/project?	In our case study:
a)	Integration:	- Integration refers to the interaction between researchers and citizens
b)	Implementation:	- Implementation refers to the repertoires of mechanisms employed by citizens, researchers and their organisations to facilitate integration
c)	Impact:	- Impact refers to the implications – positive and negative of alignment (and misalignment) of preferences, practices, and repertoires concerning PE
6)	Which **definition of change** do you use?	We do not expect to observe change, and while time-series may be available for the EB component of our data sets, they are not likely to be particularly relevant in the context of the combined use of data sources (i.e. including the researcher survey and the CCN RPO study). The expectation / hypothesis is that different ways of doing research (looking specifically at PE) would lead to different outcomes. But we stress that in this study, we do not expect to observe change; but taking a comparative perspective, we might find correlations that could be indicative of the opportunity for change. Markers of potential change, not observations. We work from the assumption that 'productive interactions' between scientists and researchers are conducive to the relevance and impact of science in society and the overall trust in science and scientific institutions. We wish to understand the nature of these interactions from a 'balance and quality' rather than 'quantity' point of view. We would expect that striking the 'right balance' leads to positive change in the social robustness of knowledge products and the legitimacy of science. We explore the issue based on comparisons of situations / clusters characterised by balance and imbalance respectively.
a)	What changes do you expect to happen?	But we would expect to tap into potential change using measures of, e.g., trust in science (citizen perspective) or engagement / job satisfaction (researcher perspective)

7) How will you consider **contextual factors** relevant for assessing pathways and impacts of RRI? (See also "*credible contextualisation*" in D1.2)	The analyses will be comparative, and we will include contextual variables and controls / co-variates. For the Eurobarometer this would mean a range of traditional socio-demographic variables plus religiosity, familiarity with science etc. For the researcher survey, this has not been addressed yet. More importantly, in terms of credible contextualisation, we will engage diverse users of potential indicators emerging from this study in discussions about feasibility and relevance.
8) How does the study contribute to **the monitoring framework (WP1)**?	The study will exploit data from different sources to both create indicators of alignment and legitimacy of science. Furthermore, the study will explore the opportunities for presenting the indicators in a way that can be used by regional actors (e.g. mapping of imbalances in Europe).
9) How is the study connected to the **implementation plan (WP2)**?	The study connects to the Eurobarometer, Researcher survey and the CCN RPO study. Specifically, we will re-use insert items from the EB in the researcher survey and use the CCN RPOs study to acquire knowledge about the engagement repertoires and priorities at an organisational level. The fact that the Eurobarometer instrument is fixed at this point implies that we will need to rely on operationalisation of some concepts, such as trust, in accordance with the Eurobarometer survey.
10) How does the study contribute to answer the **main question in WP5**: to understand better the pathways downstream of RRI practices and policies?	The study contributes to understanding patterns of responsible practices (conceptualised as balanced implementation of the integration of citizens and scientists, explored by focusing on preferences, practices and repertories for engagement), and how such patterns may connect with broader impacts such as socially robust knowledge and trust in science.

a) Which **pathway of RRI** are you addressing? Where should the pathway lead and why do you expect the pathway to happen?	Cognitive and procedural transformation related to PE (to be assessed comparatively) are likely to generate impact through processes of inclusion, pluralisation and legitimisation.
b) Referring to the Grant Agreement, which **kind of benefits** (societal, economic, democratic, scientific) of RRI practices and policies do you expect in your study?	Scientific and societal benefits (relevance and trust). We expect that different implementation modes, specifically alignment of preferences, practices and available engagement repertoires, will have implications for science (optimising societal robustness and relevance of knowledge products) and for society (cultural authority / legitimacy of science, indicated, e.g., by citizen trust in scientists and scientific institutions).
c) Which **kind of costs** of RRI practices and policies do you expect in your study?	For both citizens and researchers, mutual interaction involves the potential crowding out of other activities that are considered more valuable (in terms of recognition / merit / status).
11) How does the study produce knowledge **relevant to the users**?	The study should be relevant to researchers and citizens interested in engagement, as well as science policy makers at regional and institutional levels interested in improving engagement, and the relevance of science and trust in scientific institutions.
12) **Who** implements the study? **Who is involved**? Which partners from the consortium are involved?	Aarhus university will carry out this study. Coordination with Fraunhofer in terms of items going into the researcher survey. The Country Correspondent Network could potentially help contextualise the findings.
13) How will it be implemented? **Specific steps** in order to complete the study. Flashing insight in steps, methods, resources needed…	The following steps are envisaged: • The conceptual framework will be further developed during 2020 • The EB is already fielded, so that provides an initial framing of Qs to be employed also as part of the researcher survey • Specific items to be employed in the researcher survey will be presented by end-2020 and discussed with Fraunhofer • Elements to be adopted in the CCN RPOs study will be developed in 2020 • Once all empirical work has been concluded (in 2022), analyses will be performed • Potential indicators identified by mid-2022

	• Paper written by end-2022
14) **Timing and resources**	Approximate work effort: 5 PM for Aarhus. Start in Fall 2020 and end by end-2022. At the moment, the EB is expected to be fielded in fall 2020, so it should be feasible to start late 2020.

SUPER MoRRI

Scientific Understanding and Provision of an Enhanced and Robust Monitoring system for RRI

Horizon 2020, Science with and for Society Work Programme 2018-2020, Topic: SwafS-21-2018

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