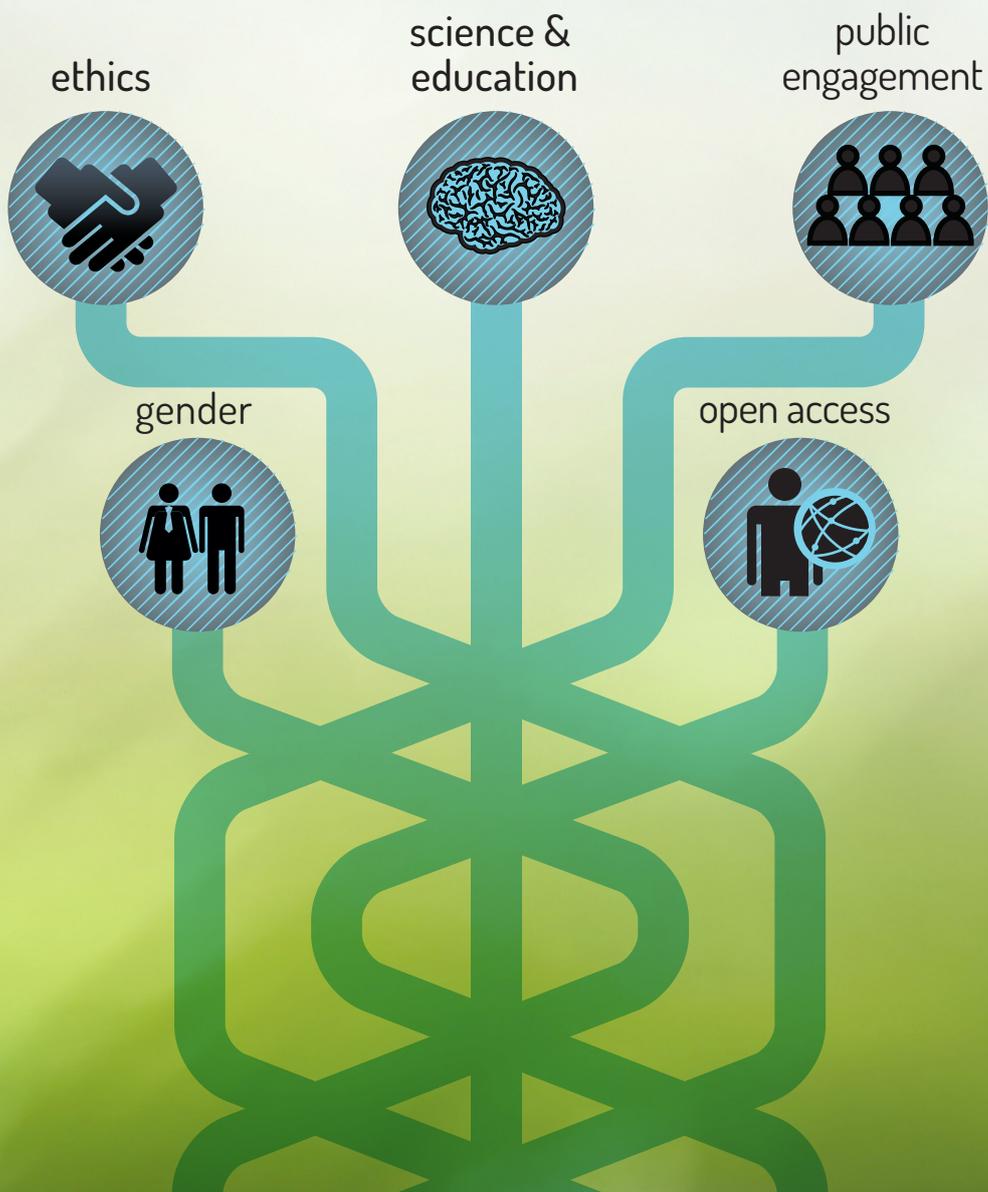


Transformative RRI action plan for Fraunhofer

DELIVERABLE D4.2





JERRI – Joining Efforts for Responsible Research and Innovation

Deliverable D4.2

Transformative RRI action plan for Fraunhofer

Project Name	Joining Efforts for Responsible Research and Innovation (JERRI)
Project No.	709747
Project Type	Coordination and Support Action
Project Duration	01.06.2016 – 31.05.2019 (36 months)
Project Coordinator	Philine Warnke, Fraunhofer ISI
Funded under	Horizon 2020, Science with and for Society SwafS
Work Package	WP4: RRI action plans at Fraunhofer
Dissemination Level	Public
Planned Date	Month 23 (April 2018)
Actual Submission	31.10.2018
Version	Draft version
Authors	Philine Warnke, Andreas Röß

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 709747.



TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	4
1 Purpose of the report in the JERRI context.....	6
2 Introduction	7
2.1 Structure of the report	7
2.2 Methodology.....	7
3 Results: The RRI Transition Roadmaps.....	15
3.1 Ethics	16
3.1.1. Starting point: JERRI pilot activities & long-term vision	16
3.1.2. Long-term transition roadmap	18
3.2 Gender	19
3.2.1. Starting point: JERRI pilot activities and long-term vision	19
3.2.2. Long-term transition roadmap	22
3.3 Societal Engagement	25
3.3.1. Starting point: JERRI pilot activities and long-term vision	25
3.3.2. Long-term transition roadmap	27
3.4 Open Access.....	29
3.4.1. Starting point: JERRI pilot activities & long-term vision	29
3.4.2. Long-term transition roadmap	32
4 Conclusions: Synthesis across RRI dimensions.....	34
4.1 Connecting the dimensions.....	34
4.2 Key long-term action lines.....	35



ABBREVIATIONS..... 37

PUBLICATION BIBLIOGRAPHY 38

ANNEX I..... 39



EXECUTIVE SUMMARY

As a formal deliverable for the JERRI project and part of work package 4, the present report D4.2 ('Transformative RRI action plan for Fraunhofer') gives insight to the developed long-term transformative action plan (roadmap) for the several dimensions of RRI. The deliverable is the counterpart of Deliverable D5.2 in which TNO outlines their roadmaps in order to advance responsible research and innovation.

The two most critical action lines for Fraunhofer are located on the **intra-organizational level**:

- aligning RRI with the intrinsic motivation of the organization, e.g. excellence in the Fraunhofer case (more important than direct "extra" incentives)
- building up RRI competences on the right level

These processes however can be substantially enabled by support at the **environment level**:

- providing RRI educated staff (most important reflexive capacity)
- providing RRI evidence

Finally, on the **individual actor level** these measures need to create space and capacity for reflexivity. Even more than the specific competences, the ability to question ourselves and to reflect common research practice seems key for RRI across all dimensions. This willingness to be open for a change is certainly an individual capacity but also needs to be enabled by the organization and its environment (providing sufficient resources, etc.) through allowing space.

Although we identified these critical factors towards deep institutionalization of RRI, the question remains to which already existing parts and processes of the organization our RRI aspirations could be connected. The results of the roadmapping workshops point out to the following **inroads**:

- feed-in of RRI through a general (further) training programme for (new) employees and in particular for leadership (employees at management level)
- mobilize the Fraunhofer Think Tank for connecting and bundling RRI actors and aspirations
- building on and advancing already existing RRI related knowledge and structures of the Fraunhofer-Gesellschaft



- tying RRI to other already established discourses and topics of responsibility, e.g. sustainability, integrity, diversity, etc.
- intensifying the exchange and strengthening the network between pioneer institutes
- introducing RRI into central Fraunhofer events in particular “Netzwerk Meeting” and orientation course for new staff



1 Purpose of the report in the JERRI context

In the JERRI project, Europe's two largest Research and Technology organizations (RTOs) TNO in the Netherlands and the German Fraunhofer-Gesellschaft have joined forces to advance towards responsible research and innovation practices. In this mutual learning process, we are supported by two research teams. One is from the Manchester Metropolitan University who have developed the theoretical framework of "deep institutionalization" to understand responsibility-oriented organizational change processes. The second team is based at the Institute for Advances Studies (IHS) in Vienna and supports us by monitoring the process thereby maximizing the learning effects. At the current point in time, we are in around three quarters of the project.

The purpose of the current document is to present the specific actions towards institutionalization of RRI within Fraunhofer and the envisaged pathway for a long-term transition towards deep embedding of RRI into the *DNA* of the organization. We developed these long-term transition roadmaps within JERRI work package 4 through an interactive process together with several actors from within and outside of our organization.

This document builds on several earlier steps presented in previous documents:

- Deliverable 2.1 discussed the *process* of goal-setting within Fraunhofer;
- Deliverable 2.2 documented *specific goals* for Responsible Research and Innovation (RRI) at Fraunhofer; and
- Deliverable 4.1 discussed various *organizational barriers and enablers* regarding the institutionalization of RRI at Fraunhofer and TNO.

More information on the RRI dimensions and their current implementation within Fraunhofer and TNO can be found in *D1.1 Synthesis of existing RRI practices*. An outline of the theoretical framework of institutionalization of RRI is provided in *D1.2 Deepening 'Deep Institutionalisation'* (November 2016) whereas the *shared lessons learned from the process of goal setting* are documented in D10.2.

2 Introduction

2.1 Structure of the report

Below, in section 2.2, we first present the methodology and theoretical framework that we have applied to arrive at the transition roadmaps. In chapter 3, we then introduce the transition roadmaps for each of the four RRI dimensions tackled in the JERRI project¹. In doing so, we also briefly revisit the short-term action plans and visions that we already presented in Deliverable 2.2. We do this because the visions were extended in the roadmapping activities and because in some cases the pilot activities were advanced in the course of the implementation process. Finally, in section 4, we discuss the findings and focus on the crosscutting insights and conclusions for the overall organization and the way forward towards a systemic and comprehensive advancement of RRI.

2.2 Methodology

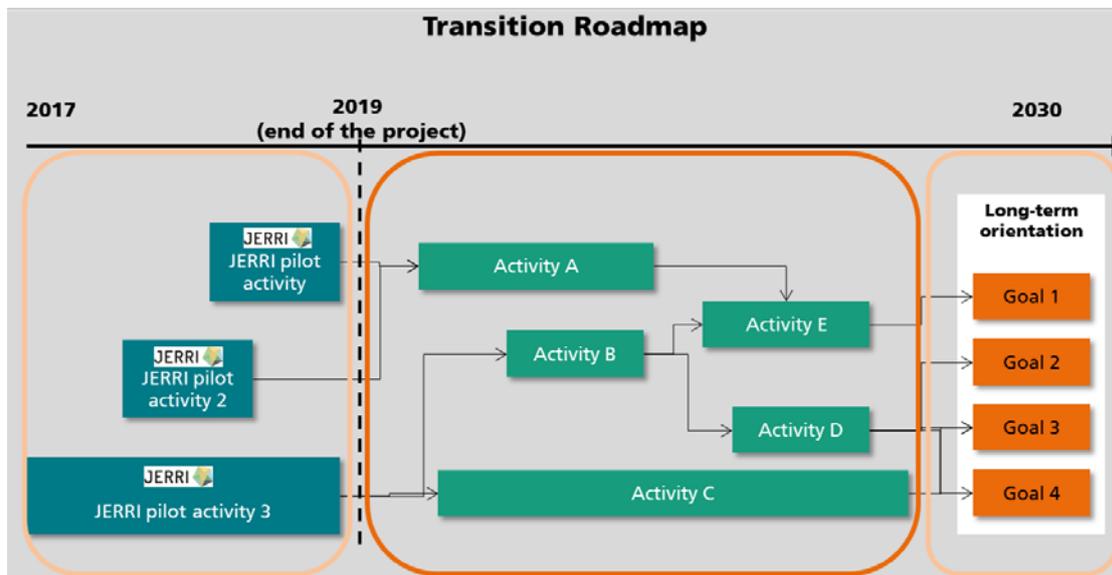


Figure 1: Transition Roadmap Principle

To develop a transformative action plan, we carried out workshops for each RRI dimension. The workshops were moderated by Fraunhofer ISI and took place at different locations, i. e. in the city or at the place where the respective Fraunhofer partners

¹ As explained in previous deliverables, Fraunhofer integrated the science education dimension into the activities for societal engagement.



responsible for the implementation of the pilot activities are located. Each workshop was carried out as a one-day workshop and held in German. For a more detailed overview of the workshops, see also Table 2. Figure 1 illustrates our basic approach to the RRI roadmapping process. In the left part of the time axis for the period until 2019, detailed action plans are in place in each dimension to implement the selected JERRI pilot activities. The transition roadmapping however focused on the long-term transition process towards our vision of a deep institutionalization of RRI within Fraunhofer.

Roadmaps provide a structure for reflecting on a timeline of developments across diverse realms (Phaal et al. 2010). There are a number of different types of roadmaps. A very common one however is the normative roadmap that describes steps towards a future goal as in our JERRI case. This approach of first sketching a visionary goal “and then looking backwards from that future to the present in order to strategize and to plan how it could be achieved” (Vergragt, Quist 2011, p. 747) is also known as “backcasting”. Usually, the structure of a roadmap is highly visual and thereby enables workshop participants from different domains to jointly discuss the steps, their sequence and the interrelations.

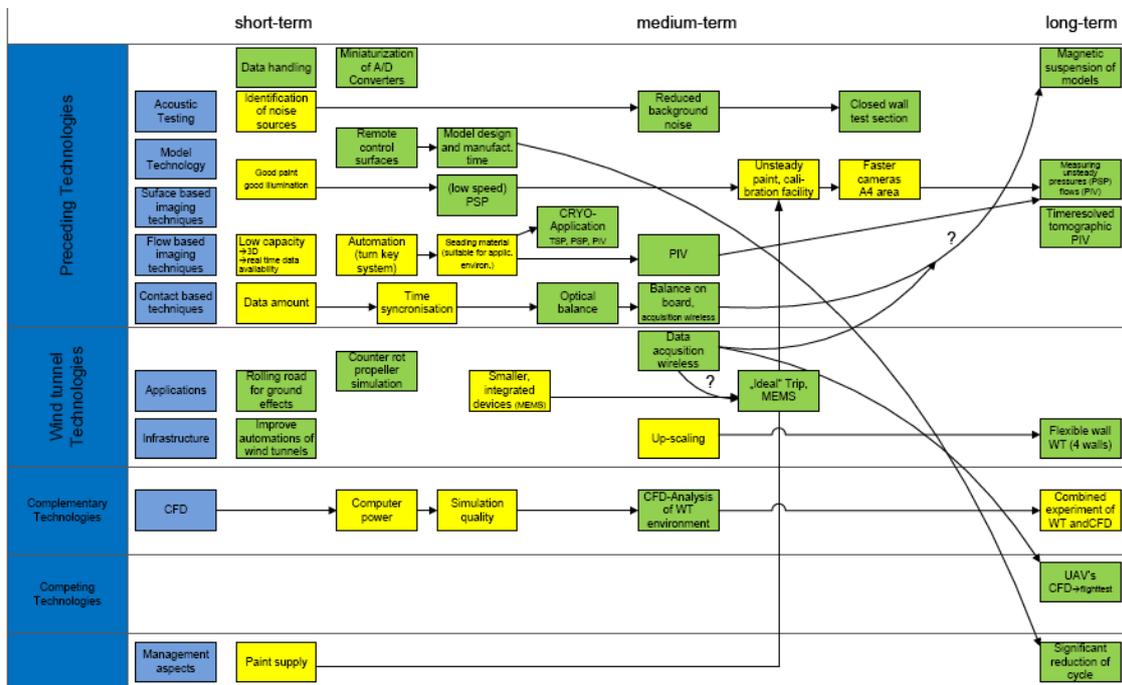


Figure 2: Typical Technology Roadmap

One key challenge in roadmapping is to define the layers of the roadmap. In order to create a powerful roadmap, the layers need to capture the main realms of change required in the system development. In the business context where roadmapping is often used to plan the steps and resources needed for a successful product launch, these layers are often technologies, market and competences, and often the technologies are detailed in different areas as in the example above.

In the case of organizational change for RRI, such levels are not suitable for obvious reasons. Rather for structuring our roadmapping, we needed to build on the theoretical insights of our deep institutionalization framework (Randles 2017). This framework highlights three levels of organizational change to be taken into consideration for understanding and thereby fostering organizational change:

- I. *Inter-organizational & environment level:* The level of institutional logics within the organization's environment and inter-organizational relations, for example nation state policies and its effect on organizations. In the case of Fraunhofer, e.g. the federal ministry for education and research (BMBF), who is partly funding the organization, is an important institution in the environment. At the same time, other organizations of the German research landscape such as the



Max Planck Society, the Helmholtz Association and the Leibniz Association are important inter-organizational factors as Fraunhofer fills a specific position.

- II. *Intra-organizational level:* This level includes the organizational culture, its structure and the established processes and routines within the organization. It is the most crucial one for achieving organizational change. It concerns the way and the ability of the organization to cope with different institutional logics, organizational cultures, missions and goals.
- III. *Individual Actor level:* This is the level of individual staff members within the organization. A particular focus is on institutional entrepreneurs and their performance as change agents who are willing and in a position to make a difference in the organization. At the same time, the “normal” employee also needs to be enabled to become enrolled into the change process.

Accordingly, we used these three levels as the structure of our transition roadmaps as outlined in Figure 3. It shows the intra-organizational level as the most relevant one. The long-term vision was taken from the previous phase of goal development (Deliverable 2.2). It was presented, reviewed and, where needed, adapted or specified in the actual workshops. The barriers and enablers were identified in interviews in advance to the roadmapping workshop (cf. Deliverable 4.1) and presented as an introduction to the discussion. Figure 4 shows a typical outcome of one of the roadmapping workshops.

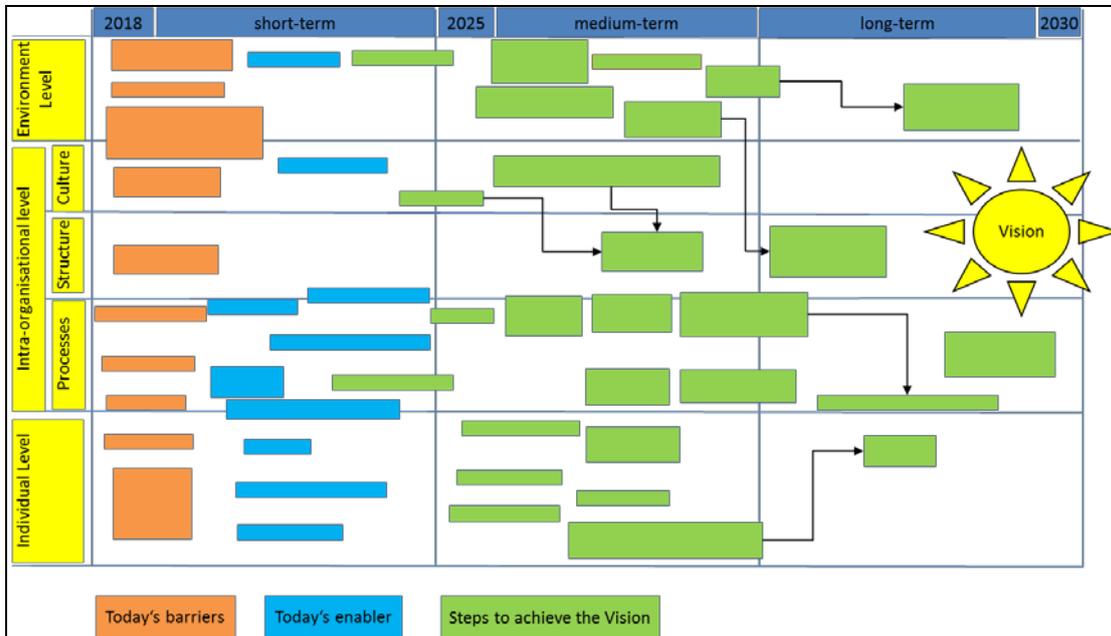


Figure 3: Template JERRI Fraunhofer Transition Roadmaps



Figure 4: Typical Workshop Setting for Development of the JERRI Transition Roadmap (Gender)

Workshop process

Table 1 provides an outline of a typical workshop process. The actual workshops differed slightly because of different situations in the four RRI aspects. Especially the ethics workshop focused on one specific pilot topic, i. e. the ethics review of the internal programming – one of its highly visible pilot activities. This workshop was also shorter because high-ranking participants were not available for a full day. In the gender workshop, participants needed more time to discuss the subject of the workshop as the selected focus topic “gender in research content” had not been previously tackled by JERRI. Originally, it was foreseen to open the discussion towards the other dimensions after the roadmapping but this proved not to be realistic as the full time was needed to work on the specific dimension.

Table 1: Typical Roadmapping Workshop Agenda

Time	Step	Format
45 min	Introduction: <ul style="list-style-type: none"> - project background - workshop goal and agenda - specific dimension & state of activities 	Plenary presentation
45 min	Joint interactive Review of the Vision: <ul style="list-style-type: none"> - How would I notice the realization of the vision? - What would be measurable indicators? 	Interactive Plenary Post-It session
45 min	Presentation of Interview findings on barriers and enablers	Plenary Presentation
45 min	Lunch	
2,5 hrs	Roadmapping <ul style="list-style-type: none"> - How to overcome the barriers, reap the opportunities of the enablers and reach the vision? 	Interactive Plenary Post It Session



Time	Step	Format
45 min	<i>specifying selected pathways (only in the gender workshop)</i>	<i>small group work</i>
45 min	Way forward, Reflection & Feedback Filling in the evaluation questionnaire	Plenary

Table 2 gives an overview of the type of workshop participants. In line with the primary goal of organizational change within Fraunhofer, the focus was clearly on internal participants. One important aspect in selecting these participants was to engage the key change agents, i. e. actors able to move something in the organization located in the central administration. As an example in the case of ethics, this would be the colleague actually in charge of the internal programming or, in the case of open access, the head of the Open Access department. Important change agents for all dimensions are colleagues from the central think tank advising the overarching Fraunhofer strategy. At the same time however, we made an effort to have people from the ground, i. e. institute level. This was important as in the pre-analysis it had emerged that people at the central level did not recognize some of the important RRI barriers. Especially we reckoned that the problems arising when integrating RRI in everyday practices would best be understood at researcher/institute level. Therefore, in all workshops we had “ground level actors” such as an institute’s library manager (OA), a researcher in an area with gender sensitive aspects (gender) and a colleague actually applying citizen engagement into regular research projects (SE). One important group we integrated as often as possible was the Fraunhofer CeRRI, a Fraunhofer research team created within the JERRI duration with a special focus on societal engagement but also on gender in research. In addition to the internal participants, we recruited external ones where the interview results indicated that they could make substantial contributions to the transition process. Examples are managers of pioneering Open Access publishers, a person from the ministry keen on promoting citizen engagement in research and a colleague from Austria who had first-hand experience from a pioneering support programme to gender sensitive applied research that would be of high relevance to Fraunhofer (Gender).

Table 2: Overview Transition Roadmapping Workshops

RRI Dimension & Focus	Workshop date & place	No. of participants ²	Type of participants
Ethics Integrating ethical reflection into internal programming	20.12.2017, Munich	9	Internal <ul style="list-style-type: none"> - colleague in charge of internal programming (central level) - involved in strategy development (think tank) - involved in ethically sensitive research areas (institute level) - involved in ethical support (central level) - JERRI Dimension leaders
Gender Equality Gender in research content	20.2.2018 Stuttgart	13	Internal <ul style="list-style-type: none"> - Equal opportunity officers (central and institute level) - researchers into gender sensitive research (Fraunhofer CERRI) - researcher in a gender sensitive area (health) - JERRI Dimension leaders External <ul style="list-style-type: none"> - Evaluator Austrian programme for gender sensitive applied research
Open Access	8.3.2018 Stuttgart	12	Internal <ul style="list-style-type: none"> - Fraunhofer actors involved into open access strategy (central level)

² Not counting IHS observers who were present at all workshops except for ethics and gender.

RRI Dimension & Focus	Workshop date & place	No. of participants ²	Type of participants
Open science in Fraunhofer			<ul style="list-style-type: none"> - Library Manager (institute level) - Fraunhofer JERRI Dimension leaders <p>External</p> <ul style="list-style-type: none"> - Open access publisher - TNO JERRI dimension leader
<p>Societal Engagement (&Science Education)</p> <p>Societal engagement in Fraunhofer</p>	11.04.2018 Oberhausen	10	<p>Internal</p> <ul style="list-style-type: none"> - strategy development (think tank central level) - Fraunhofer group involved in participatory design research and practice at institute level (CERRI) - Fraunhofer JERRI Dimension leaders <p>External</p> <ul style="list-style-type: none"> - BMBF actor active in SE

3 Results: The RRI Transition Roadmaps

In the following chapter, we present the results of the Roadmapping Workshops for each RRI dimension. We first briefly review the planned short-term activities as these have been already presented in detail in previous reports but were advanced in some cases. We then outline the vision based on the one previously developed but in some cases specified and sharpened in the new round of reflections. Finally, we report the steps adopted to achieve the vision along the timeline of the roadmap.



3.1 Ethics

3.1.1. Starting point: JERRI pilot activities & long-term vision

In the ethics dimension, the following three **pilot activities** had been adopted (Teufel, Röß 2017, p. 13ff.):

- Ethical screening and consultancy for project proposals in the internal research programmes
- Multiplying orientational knowledge on research ethics in the research management qualification programme 'Forschungsmanager/in'
- Set-up and test of a discussion format on one particularly relevant application field

The long-term vision was first developed in the visioning workshop in work package 2 and then specified in the roadmapping workshop. It contains the following elements:

General ambition:

Fraunhofer takes on a leading role in the ethical discourse of the applied sciences. It is being consulted for ethical issues in Fraunhofer-dominated strategic fields as it actively deals with the respective ethical challenges.

Ethics contributes to the creation of identity at Fraunhofer. Enabling the organization has to be the starting point.

- **Responsibility:**
 - o Besides technological developments, Fraunhofer addresses societal, ecological and economic implications ("thinking mid- and long-term").
 - o Fraunhofer integrates and lives up to ethical responsibility.
 - o Fraunhofer carries out research projects with a long-term perspective and takes on responsibility towards its customers and society as a whole. This responsibility is borne by both project members and executives.
- **Enabling:**
 - o Fraunhofer staff is enabled (in terms of 'competence') to live up to 'ethics'.



- **Value pluralism:**

- Fraunhofer creates and supports an open, constructive and respectful culture of dealing with conflicts, e.g. via clearing agents, consultancy services, etc.
- Fraunhofer actively deals with different moral concepts.

At the beginning of each roadmapping workshop, we presented the long-term vision again and asked the participants to comment, to add something or to specify the vision.

The following points have been discussed in the roadmapping workshop:

Fraunhofer is perceived as a relevant actor in ethics:

- Its ethical expertise is visible to the outside world.
- It is seen as a role model for tackling research ethics.
- It is well connected with external ethics experts on key topics.
- It functions as a neutral knowledge provider for the technical background in ethical issues.
- It is an advisor to policy actors (national and EU).
- Interested citizens find information at Fraunhofer about the ethical implications of specific research topics.
- Fraunhofer takes a proactive stance towards ethics, it:
 - formulates positions towards ethically critical technology issues,
 - actively engages in the quest for solutions for ethically sensitive issues such as e.g. the demand for complete replacement of animal testing for scientific and ethical reasons and
 - promotes access to research results for all.

Fraunhofer culture encourages ethical reflection:

- Ethical reflection is appreciated and pays off, incentives are in place.
- There are no sanctions; ethical conflicts can be discussed openly. Staff may refuse certain research lines for ethical reasons without any negative consequences.

Ethics is embedded into all processes:

- Ethical debate and reflection on societal impact of technology are well established as a taken for granted element in every research project.



- Ethics competence exists in Fraunhofer. There are formats for ethical debate across the organization.
- An ethics commission is involved into the process of exploring new business fields.
- Strategic initiatives are systematically assessed for societal implications.

3.1.2. Long-term transition roadmap

The transition roadmap specifies the key steps to be initiated after the ending of JERRI in order to achieve the vision. Figure 5 shows the transition roadmap for ethics.

Mid-term time horizon (up to 5 years)

- Promote the JERRI ethics guidelines developed for the pilot activity 'Ethical Screening' (independently of its use in the pilot activity for assessment of the internal programming).
- Initiate discourses, raise awareness (building on JERRI pilots).
- Strengthen individual competences (building on JERRI pilots).
- Promote general sample cases of ethical conduct (e.g. via the internal staff magazine "Quersumme").
- Make known the possibility to decline research requests from clients.
- Prioritize these activities that may cause a snowball effect.
- Define clear fields of action, e.g. in line with strategic initiatives.
 - o Monitor ethical aspects of the strategic initiatives.
 - o Draft position papers that take into account current public debates (e.g. future of work).
- Establish transparent processes for the choice of partners and clients.
- Exploit momentum of transformative events (e.g. crisis in the science system due to ethical/normative violations, new science funding principles).

Long-term time horizon (up to 10 years)

- Set standards.
- Soften goal conflicts: Establish ethics as a positive element of excellence and quality criterion rather than an additional burden.
- Drive forward deep cultural change: Strengthen a culture of actively dealing with ethical questions.



Figure 5: Transition roadmap for ethics

3.2 Gender

3.2.1. Starting point: JERRI pilot activities and long-term vision

For the gender dimension, the following three **pilot activities** had been previously selected (Teufel, Röß 2017, p. 23ff.).

1. **‘Gender Diversity Toolbox’**: further development, opening up and internationalization of the existing Gender Diversity Toolbox
2. **‘Role models at Fraunhofer’**: the identification and public communication of role models by means of integration into the Gender Diversity Toolbox and by designing an electronic booklet
3. **‘Gender in research content consciousness’**: identification and (further) development of existing checklists, identification and communication of related case examples by means of integration into the Gender Diversity Toolbox.

In the meantime, activities 1 and 2 are fully under way, whereas activity 3 will be expanded based on the workshop results. In the gender diversity toolbox, a section for gender in research content is already established.

In the vision developed in the first workshop for the gender dimension, the aspect of gender sensitive research was not covered in much depth. Only one sentence stated that “Gender competences exist, also for gender in research content” (Teufel, Röß 2017, p. 25). Therefore, we do not revise the general ambition like in the other sections for Ethics, Open Access, etc.

Through the interviews and roadmapping workshop, the following, more specific, aspects emerged: The single points were mentioned by the participants or the interview partners (cf. Warnke et al. 2018) and had been clustered by ISI moderators during or after the workshop.

- **Competences for gender in research content are widespread and easily accessible in Fraunhofer:**
 - o Everybody has gender competence and some people have gender expertise. Both interact in an adequate manner.
 - o Gender competence is well defined.
 - o A formal process within research projects is in place to identify and recruit required gender competences.
 - o Gender competence is easily accessible.
 - o Trainings in gender sensitive research are integrated in the mandatory training schedule.
 - o Leadership is competent in gender sensitive research.
 - o There is a person with specific gender expertise for each thematic cluster of Fraunhofer institutes (“Verbund”).
 - o When we write research proposals, we know whom to approach for support to adequately address gender aspects.
 - o Writing an original project-specific paragraph on gender aspects for a research proposal is fast and easy because people are familiar with the basic concepts of gender sensitive research.
 - o Reflexivity and openness are seen as core competences.
 - o All Fraunhofer publications are written in a gender sensitive language.
 - o A correct gender sensitive formulation no longer creates confusion.
 - o We are using gender stereotype challenging language wherever possible.



- **Gender sensitive research is taken for granted as a mandatory part of excellent research and innovation:**
 - o Scientific project posters highlight gender aspects together with other findings.
 - o Fraunhofer is a role model for gender sensitive research.
 - o Excellence is the motivation for addressing gender aspects.
 - o All participants in a research project are ready to deal with gender aspects.
 - o For each project kick-off meeting, there is a roundtable where gender aspects are discussed in a positive, motivated and constructive spirit.
- **Gender perspectives are fully integrated into all research processes. This has boosted validity and relevance of research at Fraunhofer:**
 - o Our results are more versatile and conclusive.
It is a well-established practice to continuously check research findings for gender aspects.
 - o Colleagues reflect automatically on gender aspects in their research.
 - o We ask the right questions for finding out what our research means in terms of gender aspects.
- **Gender sensitivity is deeply embedded into Fraunhofer's culture and driving all staff:**
 - o Gender aspects are addressed in key documents such as Leitbild (guiding vision), code of conduct and mission.
 - o Gender-related behaviour/competence is taken into account in assessments.
 - o Various research teams discuss excitedly: Wow, what kind of gender aspects did you identify in your project?
 - o Discussions on gender/men/women are no longer conducted in a tongue-in-cheek manner. There are no weird comments as soon as the word gender is mentioned.
 - o There is not only attention for gender differences but also positive expressions for gender commonalities.
 - o Male colleagues are absent from meetings because of a sick child as often as female ones.
 - o "You are our gender expert" is truly meant as a compliment.
 - o Diverse disciplines and perspectives collaborate on an equal footing.
- **Transparent processes are established on all levels (Institute, Thematic Cluster (Verbund), central level).**



3.2.2. Long-term transition roadmap

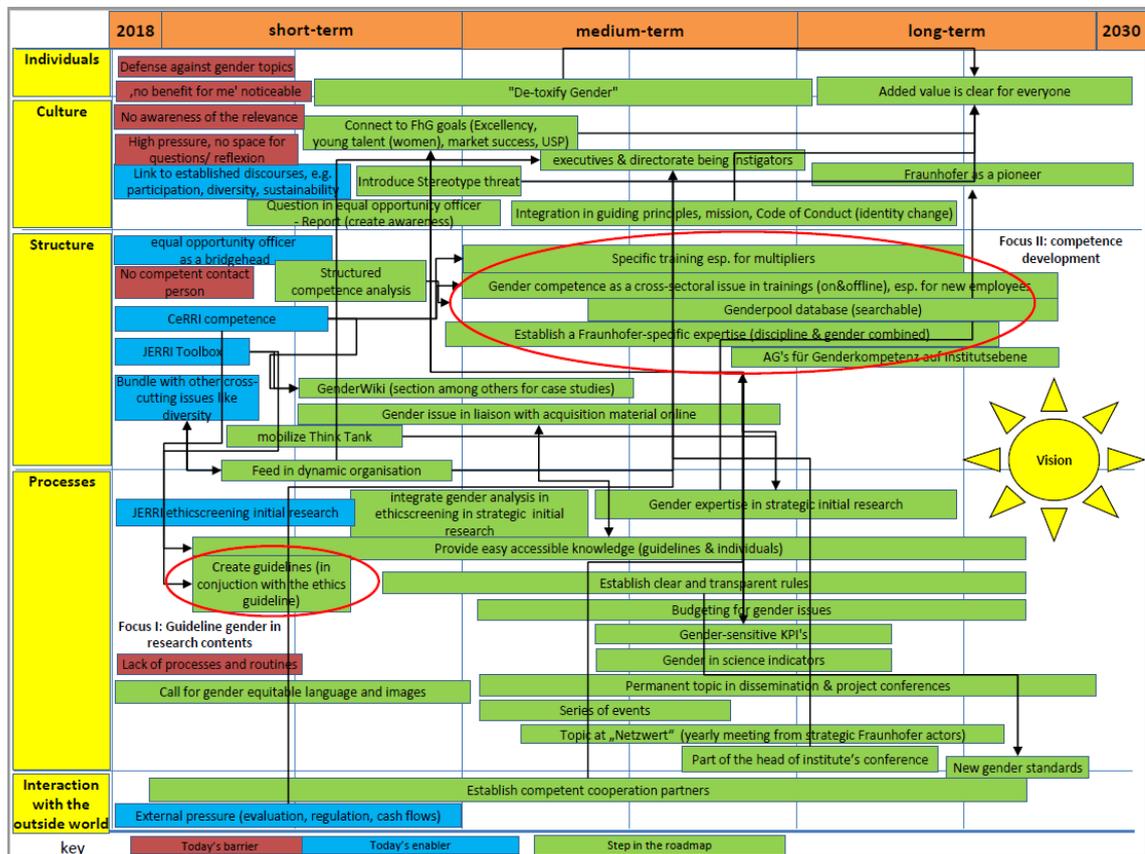


Figure 6: Transition roadmap gender in research content

Figure 6 illustrates the roadmap resulting from the workshop discussion. Two core lines of activities emerged:

1. Building up competences for gender in research content
2. Providing targeted guiding material for gender sensitive research

The first aspect of **competence development** is seen as a mid- to long-term activity.

The following steps would be required:

- Competence Analysis (What competences do we need and where?)
 - o e.g.: Fraunhofer-specific expertise that combines disciplinary and gender competence
- Validation (What do we already have? Where?) Forming of Portfolio groups
- Development: Recruiting/Training to establish the required portfolio groups



Possible outcomes could be:

- Establishment of specific training programmes esp. for multipliers
- Establishment of gender competence as a cross-sectoral issue in all trainings (on- and offline), especially for new employees
- Initiation of working groups for gender competencies on institute level

The second line of action, the provision of **guiding material for gender sensitive research** can be well aligned with the Gender Diversity Toolbox that is developed as a JERRI pilot activity. The toolbox will include a special section on gender sensitive research providing references for the identified material such as the Commission’s “gendered innovation” and the toolkit “gender in EU-funded research” developed by “Yellow Windows”³ and in particular links to case studies of interest for Fraunhofer. It is therefore positioned in the short-term window of the roadmap and can be started partly even in the duration of JERRI. Participants discuss however that it would be desirable to have a Fraunhofer-specific gendered research guideline. Yellow window one is seen as a suitable model. Also, the existing material from previous work in the Discover Project by Professor Schraudner from CeRRI could be used here but would need to be updated to the current state of research. It is emphasized that the use of this guideline would need to be promoted with other means than only the diversity toolbox. For example, a reference to the material should be provided along with other guidelines for project acquisition. It is key that the material is easily accessible, demonstrates the added value of gender sensitive research and provides also information on competent persons within Fraunhofer and other organizations that are able to support a specific gender sensitive research line, e.g. a searchable database of gender experts such as the one provided by FemTec.

Within JERRI, there is one particular window of opportunity for the promotion of the guidelines of gender sensitive research as they can be fed into the ethics assessment of the internal programming, which is going on as a pilot activity in the ethics dimension. Participants reckoned that the high visibility of the internal programming makes it a very suitable entry point also for gender in research content.

³ <https://www.yellowwindow.com/genderinresearch>



Other elements of the transition roadmap are:

Short- to mid-term:

- Link to established discourses, e.g. participation, diversity, sustainability.
- equal opportunity officer as a bridgehead
- Call for gender equitable language and images.
- Create awareness by integrating a question in the gender reporting.
- Mobilize the Think Tank (a certain Fraunhofer unit, located in the headquarters at Munich).
- Feed in dynamic organization.
- Establish competent cooperation partners.
- Connect gender excellence to established Fraunhofer goals (excellency, young talent [women], market success, USP).
- Provide evidence of the value added/the danger of gender insensitivity:
 - o Introduce the stereotype threat.
- executives & directorate being pioneers

Mid- to long-term:

- 'De-toxify Gender' (comment of one participant, meaning that the term 'Gender' is often – especially by men – negatively associated)
- integration in guiding principles, mission, Code of Conduct (identity change)
- Establish Fraunhofer as a pioneer.
- cooperation with gender excellent universities
- budgeting for gender issues
- Gender-sensitive KPI's (Key Performance Indicator)
- Gender in science indicators
- permanent topic in dissemination & project conferences
- Series of events should be carried out in the future in order to promote the Gender topic.
- topic at "Netzwerk" (yearly meeting from strategic Fraunhofer actors)
- part of the head of institute's conference



3.3 Societal Engagement

3.3.1. Starting point: JERRI pilot activities and long-term vision

For this dimension, the following three **pilot activities** had been previously selected (Warnke et al. 2018, p. 42).

- **Citizen's office:** a series of citizens' meeting in which social needs can be put forth to science
- **Fraunhofer Debate:** a public debate with actors from academia and civil society on a topic of high public attention
- **Stakeholder Avatar:** an algorithm that will systematically browse the World Wide Web for relevant social interests
- **UMSICHT Dash Button:** a software-based solution to enable sustained citizen engagement in environmentally relevant scientific topics on a continuous basis

The **Vision** from the first workshop (WP 2) for societal engagement contained the following elements:

General ambition:

Fraunhofer covers all levels of participation:

- the agenda setting at which 30 % of research is defined via societal participation,
- the research process/research projects and
- societal debates.

Specification:

- A culture of participation is deeply institutionalised at Fraunhofer.
- Fraunhofer is a permanent contact point for citizens, also in 'physical' terms.
- Fraunhofer is a key enabler for participation. It points to barriers for participation and helps to smooth them out.
- Fraunhofer provides resources and leeways for participation.
- Fraunhofer bears responsibility by pursuing a participatively developed roadmap specifying the Sustainable Development Goals.

Workshop Specifications

- increased reflexivity in research



- Researchers are well versed in communicating their findings in an easy to understand manner.
- Researchers are more often in direct contact with citizens/society.
- Research is more oriented towards addressing societal challenges.
- Addressing societal challenges is identical with research excellence.
- “Societal Engagement“ becomes a normative practice.
- changed relationship science and policy (closer)
- Fraunhofer is neighbour! Technological Innovations are most of all developed for regional challenges.
- Fraunhofer shapes the interface between citizens and industry.
- Fraunhofer Institutes have opened citizens offices.
- Citizen engagement involves rights and obligations for citizens.
- new and better formats, tools, technology for structured engagement
- establishment of Research Neighbourhoods
- coaching/moderation support for stakeholder involvement in-house available for all institutes
- More societal actors are involved (NGOs, Industry, Citizen).
- Engagement becomes viral (snowball principle).
- There are formats for dialogues for all large strategic Fraunhofer topics.
- Consciousness for sustainable development is increased.
- There is a transdisciplinary internal project addressing an SDG.
- “Societal pull“ instead of “technology push“ is the core principle for identifying research topics.

Indicators that would signify the realization of the vision:

- contribution of institutes towards the index of social climate⁴
- presence of Fraunhofer Institutes in local news, daily papers, magazines
- increasing the number of Fraunhofer researchers blogs
- use of public attention/non scientific publications as evaluation criterion

⁴ The social climate index is an attempt to measure trust and social cohesion on a community level. The idea is that Fraunhofer Institutes would contribute to improve this index within their community.



3.3.2. Long-term transition roadmap

Steps towards the vision

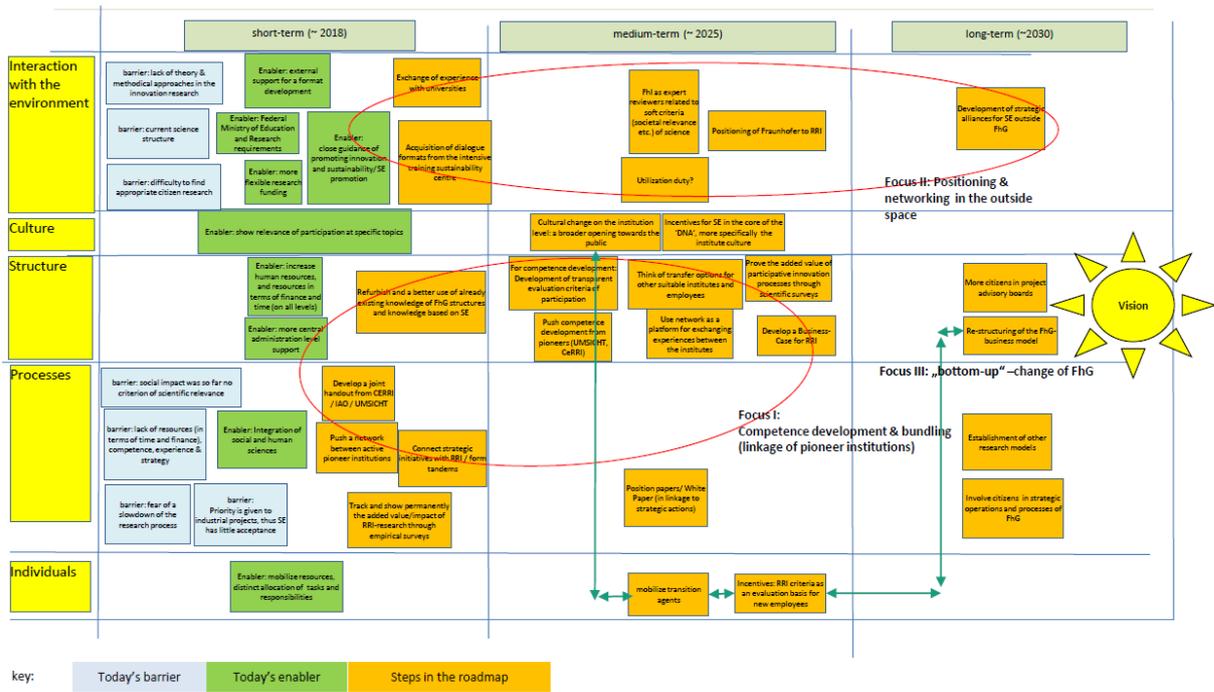


Figure 7: Transition Roadmap Societal Engagement

Figure 7 shows the transition roadmap developed in the workshop.

Three focus areas for action emerged:

1. Competence building and bundling
2. Positioning and networking in the environment
3. Bottom-up cultural change in Fraunhofer

All three are mid- and long-term ambitions with aspect 1 required to take the lead. The JERRI pilot activities can be used as an inroad into all three aspects. Already the UMSICHT experience, which will be documented and disseminated, serves as a focal point for competence building. In the workshop, it was decided to initiate a process where pioneering institutes such as Fraunhofer UMSICHT, Fraunhofer IAO/CeRRI, Fraunhofer ISI and others (e.g. the ones currently engaged in citizen science) as well as the Fraunhofer Think Tank connect and develop material for other actors in Fraunhofer wishing to venture into participatory activities. In particular, also evidence-based studies



on the benefit of participation would be very useful to promote the topic internally. Also, the group will start to compile a list of external partners interested in cooperating in this domain. As important entry points, the yearly Fraunhofer meeting (Netzwerk) and the sustainability network as well as the internal newspaper (Quersumme) are mentioned.

Other elements of the transition roadmap are:

Short- to mid-term:

- taking on the dialogue formats developed in previous activities in the context of sustainability
- exchange of experience with universities
- refurbishing and using already existing knowledge and structures of the Fraunhofer-Gesellschaft
- developing a joint handout from Fraunhofer CeRRI/Fraunhofer IAO/Fraunhofer UMSICHT
- showing relevance of participation at specific topics
- tracking and showing permanently the benefit/impact of RRI-research through empirical surveys
- pushing a network between active pioneer institutions

Mid- to long-term:

- prove of added value of participative innovation processes through scientific surveys
- pushing competence development from pioneer institutes
- for competence development: development of transparent evaluation criteria of participation
- mobilizing transition agents
- drafting position papers/white paper (in linkage to strategic actions)
- using the annual event 'Netzwerk' of Fraunhofer for exchanging the experiences between institutes
- developing a business-case for RRI in which Societal Engagement is an integral part
- increasing human resources and resources in terms of finance and time (on all levels)
- cultural change on the institution level: a broader opening towards the public
- development of strategic alliances for Societal Engagement outside the Fraunhofer-Gesellschaft

- involving citizens in strategic operations and agenda setting processes of the Fraunhofer-Gesellschaft, e.g. through board membership (“Kuratorium”)

3.4 Open Access

3.4.1. Starting point: JERRI pilot activities & long-term vision

The following short-term activities (pilot activities) had been selected in the Open Access dimension (Warnke et al. 2018, p. 32ff.):

- setting up and testing the open data infrastructure FORDATIS
- development of an open access business model and IP clarification support
- development and test of “open paragraphs” in research contracts
- development and communication of a marketing strategy for Open Access at Fraunhofer, including the identification of role models (scientists), best practices and an Open Access road show

All four activities are well under way.

The informal visions from work package 2 stated the following long-term goals:

General ambition:

Fraunhofer has undergone a fully-fledged cultural transformation towards Open Access and now lives up to its social responsibility.

Specification:

- All data and publications resulting from publicly funded scientific research are treated as commons. Full access is provided to any person wishing to consult them.
- Fraunhofer has put into place an Open Access Platform, i. e. data rooms that are open and – where needed – closed, together with the necessary infrastructure components.
- Fraunhofer researchers deal with research data and related industry collaborations in a fair and competent way. Clear rules and licensing models exist. Industry clients are supported to use Open Access business models wherever feasible.
- Fraunhofer researchers are present in Editorial Boards of Open Access Journals.



- Fraunhofer has institutionalised:
 - o quality management
 - o the protection of intellectual property using a classification
 - o personal accounts for different target groups
 - o the recording of all research data/possibility to identify research data
 - o Digital Object Identifiers (DOIs)
 - o links between research data and publications
 - o interfaces and standards
 - o long-time archival storage

Workshop Specifications

- existence of new dissemination formats (data + text)
- no financial barriers to knowledge anymore
- Memberships in institutions are not necessary anymore for access to publications.
- no discussions about subscription and contracts anymore because Open Access is the usual way of publication
- knock-on effects on other RPOs and multiple cultures
- Everybody can get access to all Fraunhofer publications and many data sets (this should be also regarded as chance to develop new cooperations).
- Change process is supported by a set of clear rules and models.
- Open data infrastructure is available for the organizational environment (FORDATIS).
- Open Access transformation: new Open Access cost models
- robust high quality of publications (approach: open review)
- more requests for research by societal actors which shows the general interest by the public in research work
- The acquisition of literature/inventory build-up by libraries is over.
- Issues regarding IP are solved and are no barriers for Open Access anymore.
- Access to data sets and/or academic literature is fast and uncomplicated.
- Open Access is the standard way of publishing.
- Publishing/Consuming Open Access is done because it is regarded as an efficient procedure.



- Open Science trainings for employees are obligatory.
- new challenge after the Open Access transformation: long-term archiving
- democratization of science (reducing societal inequalities regarding the access to knowledge)

Indicators that would signify the realization of the vision

- library staff dedicated to other tasks such as analytics of publication data
- new standards/indicators of measuring scientific impact (OA metrics): quality + openness + reuse + sharing network
- share of data sets, which can be reused
- established ethical standards, acknowledged “good practice statement” (“no predatory publishing”)
- change in citations, references, comments
- new system of identification (ORCID + DOI + organizational ID), which should be author-friendly
- by measures of efficiency (proportion of effort - time - benefit for scientific publication activities)
- The work tasks and financial expenditures of libraries have changed, higher number of Open Access publications, rising trust in science



3.4.2. Long-term transition roadmap

Steps towards the vision

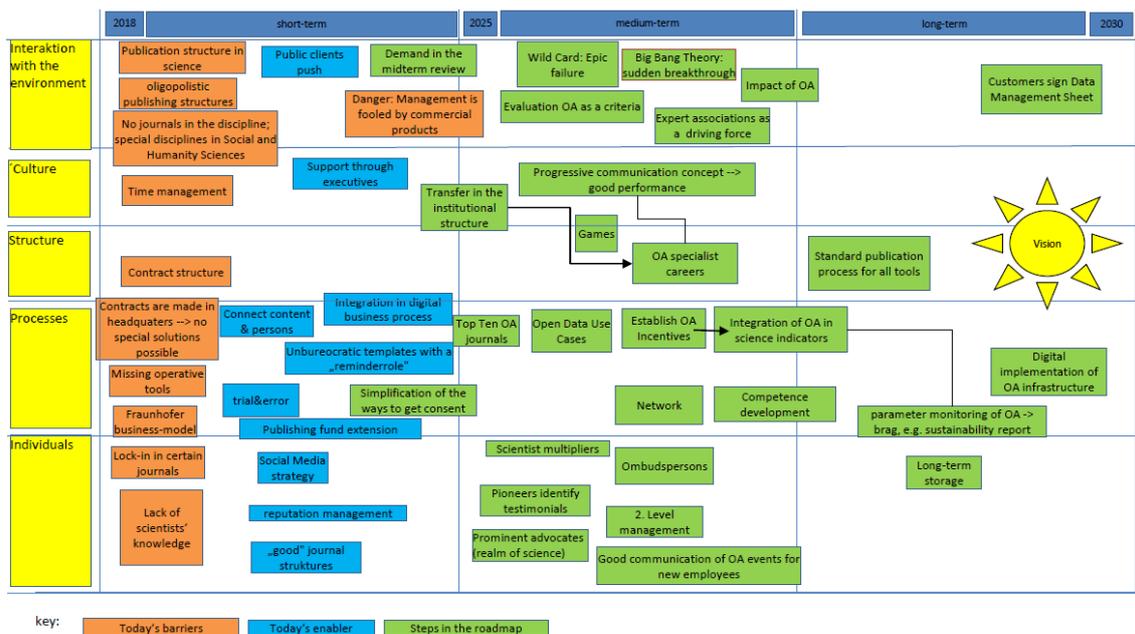


Figure 8: JERRI Transition Roadmap Open Access

Figure 8 shows the developed transition roadmap for the Open Access dimension. We identified the following three main action fields:

1. Open Access as a sign for scientific quality and as a part of the culture of science disciplines
2. Developing guiding and informational material, standardized publishing processes and introducing incentives for Open Access publishing
3. Competence building and bundling

The **first aspect** is seen as a mid- to long-term task. The specialty of this action field compared to the other two is that it is not a task that can be solved by Fraunhofer alone, but rather depends on a change of the overall science culture respectively the different cultures of the disciplines. Certain science disciplines like physics can be regarded as pioneers of Open Access, while others are lagging behind. Although Fraunhofer or the JERRI project itself cannot directly influence the overall scientific culture of the environment, it is a very important condition in order to succeed with the other pilot activities and to transform Fraunhofer successfully towards the practice of Open Access



publishing. In the workshop, we identified the following steps and actions that would be necessary:

- Open Access as a part of the evaluation criteria of projects
 - o e.g Open Access as a standard topic within midterm reviews
- Measuring the (societal, etc.) impact of Open Access in order to have evidence, empirical proof and to convince other actors of the benefits of Open Access

Although JERRI and Fraunhofer can only indirectly intervene in the scientific environment, it would be important that RTOs like Fraunhofer further advocate and commit to Open Access in the public and to further position the Fraunhofer-Gesellschaft as an RTO, which is in favour of Open Access, e.g. via position papers, etc.

The **second line of action** focuses on developing organizational structures and processes, e.g. models, standardized publishing processes and incentives fitting Open Access. Our selected pilot activities are well aligned with this.

Other elements of the Open Access transition roadmap are:

Short-term:

- support by higher management
- integration of Open Access in digital business process
- extension of the publication fund
- developing a social media strategy
- (individual) reputation management
- “good” journal structures

Medium-term:

- progressive communication strategy
- transferring the Open Access idea into the cultures of the institutes
- prominent advocates in the realm of science, who support
- pioneers identify testimonials
- identifying multipliers from the scientist staff
- Open Access specialist careers
- fostering networking between Open Access pioneers
- expert associations as a driving force



Long-term:

- digital implementation of Open Access infrastructures
- standard publication process for all tools
- full integration of Open Access in science indicators
- Open Access as an important part of science monitoring → a high share of Open Access publications is something to be proud of and “brag”, e.g. within the sustainability report.
- possibilities for long-term save of data

4 Conclusions: Synthesis across RRI dimensions

4.1 Connecting the dimensions

In Table 3, we have extracted from the four long-term transition roadmaps the key agents of change required. Furthermore, we indicate potential synergies between the different RRI dimensions:

- integration of gender aspects and participation requirements into ethical reflection guidelines; participation as an enabler for ethical reflection
- 'Fraunhofer debate' and 'citizen office' could also serve as chance to get in touch with the ethical values of civil society. This should also influence the internal value setting and ethical reflection within Fraunhofer.
- integration of Science Communication aspects into the ethical qualification programme in order to create a responsible and appropriate idea of new technologies/products in the public but also for potential customers
- Easier access to scientific knowledge also improves the outcomes of societal engagement activities.

These interfaces are important entry points for wider organizational transformation.

Table 3: Overview long-term transition roadmaps

Specific goals and activities for the different dimensions of RRI	Collaboration with change agents/ specific units needed for this	Synergy between RRI dimensions
Ethics		
Ethical screening and consultancy for the internal research projects	Fraunhofer Headquarters (strategic departments), department for internal research programmes	Connections to Ethics, Gender, Societal Engagement



Specific goals and activities for the different dimensions of RRI	Collaboration with change agents/ specific units needed for this	Synergy between RRI dimensions
Multiplying and systemizing orientational knowledge on research ethics in the research management qualification programme 'Forschungsmanager'	Fraunhofer Headquarters (Research Department Innovation), Fraunhofer Academy, Training Department (HR)	Connections to the dimensions Societal Engagement and Science Communication
Set-up and test of a discussion format on one particularly relevant application field	Fraunhofer Headquarters (Research Department Innovation), Think Tank	Connections to the dimension of Societal Engagement
Gender Equality		
'Gender Diversity Toolbox'	HR Department, Internal Communication department	
'Role models at Fraunhofer'	HR Department, Internal Communication department	
'Gender in research content consciousness'	Fraunhofer CeRRI, department for internal research programmes	Connections to the dimension of Ethics
Societal Engagement/Science Education		
Citizen's office	Fraunhofer Think Tank, Fraunhofer UMSICHT, Fraunhofer ISI, Fraunhofer CeRRI	Connections to the dimension of Ethics
'Fraunhofer debate'	Fraunhofer Think Tank, Fraunhofer UMSICHT, Fraunhofer ISI, CeRRI	Connections to the dimension of Ethics
UMSICHT Dash Button	Public relations	
Open Access		
'Setting up and testing the open data infrastructure FORDATIS'	Pioneering research groups as use cases	Connections to the dimension of Societal Engagement
Development of an open access business model and IP clarification support	Business model development, Law department	
Development and test of 'open paragraphs' in research contracts	Law department, contract development department	
Development and communication of a marketing strategy for Open Access at Fraunhofer, including the identification of role models (scientists), best practices and an Open Access road show		Connections to the dimension of Societal Engagement

4.2 Key long-term action lines

Table 4 (see Annex I) presents the crosscutting elements we have extracted from the long-term transition roadmaps of the individual dimensions.



Taken together the following key conclusions emerge:

The two most critical action lines for Fraunhofer are located on the **intra-organizational level**:

- Aligning RRI with the intrinsic motivation of the organization, e.g. excellence in Fraunhofer case (more important than direct “extra” incentives)
- Building up RRI competences on the right level

These processes however can be substantially enabled by support on the **environment level**:

- Providing RRI educated staff (most important reflexive capacity)
- Providing RRI evidence

Finally, on the **individual actor level**, these measures need to create space and capacity for reflexivity. Even more than the specific competences, the ability to question ourselves and to reflect common research practice seems key for RRI across all dimensions. This willingness to be open for a change is certainly an individual capacity but also needs to be enabled by the organization and its environment (providing sufficient resources etc.) through allowing space.

Although we identified these critical factors towards deep institutionalization of RRI, the question remains to which already existing parts and processes of the organization our RRI aspirations could be connected. The results of the roadmapping workshops point out to the following **inroads**:

- feed-in of RRI through a general (further) training programme for (new) employees and in particular for leadership (employees at management level)
- mobilizing the Fraunhofer Think Tank for connecting and bundling RRI actors and aspirations
- building on and advancing already existing RRI related knowledge and structures of Fraunhofer
- tying RRI to other already established discourses and topics of responsibility, e.g. sustainability, integrity, diversity, etc.
- intensifying the exchange and strengthening the network between pioneer institutes
- introducing RRI to central Fraunhofer events in particular “Netzwerk Meeting” and orientation course for new staff



ABBREVIATIONS

JERRI	Acronym for the project Joining Efforts for Responsible Research and Innovation
KPI	Key Performance Indicator
NGO	Non-governmental organization
R&I	Research and Innovation
RRI	Responsible Research and Innovation
RTO	Research and Technology Organization
TNO	Toegepast Natuurwetenschappelijk Onderzoek/The Netherlands Organization of Applied Scientific Research



PUBLICATION BIBLIOGRAPHY

Phaal, R.; Farrukh, C. J. P.; Probert, D. (2010): Roadmapping for strategy and innovation. Aligning technology and markets in a dynamic world. Cambridge: Univ. of Cambridge Inst. for Manufacturing.

Randles, S. (2017): JERRI – Joining Efforts for Responsible Research and Innovation Deliverable D1.2. Deepening ‘Deep Institutionalisation’. Elaborating a Concept and Developing a Typology to Analyse and Contrast the Institutionalisation of De-facto responsible research and innovation (rri); and H2020 RRI in Research and Technology Organisations (RTOs). Available online at http://www.jerri-project.eu/jerri-wAssets/docs/deliverables/wp-1/JERRI_Deliverable_D1_2_Deepening-Deep-Institutionalisation.pdf, checked on 14.12.2017.

Teufel, B.; Röß, A. (2017): JERRI – Joining Efforts for Responsible Research and Innovation. Deliverable D2.2. Description of specified RRI goals at Fraunhofer. Available online at <http://www.jerri-project.eu/jerri/results/deliverables/>, checked on 21.06.2018.

Vergragt, P. J.; Quist, J. (2011): Backcasting for sustainability. Introduction to the special issue. In: *Technological Forecasting and Social Change* 78 (5), pp. 747–755. DOI: 10.1016/j.techfore.2011.03.010.

Warnke, P.; Röß, A.; Mundt, I. (2018): JERRI – Joining Efforts for Responsible Research and Innovation. Deliverable D4.1. Discussion paper on the analysis of organizational barriers (Fraunhofer Part).



Table 4: Crosscutting elements extracted from the long-term transition roadmaps of the individual dimensions

	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
<i>individual</i>	<p>Show, using concrete examples and patterns (e.g. case studies), why achieving the goals is important for everyone in everyday life. Underpin with empirical research.</p> <p><i>Gender</i></p> <ul style="list-style-type: none"> - Added value is clear for everyone. - Introduce Stereotype Threat. - question in equal opportunity officer - Report (create awareness). - specific training especially for multipliers - Gender competence as a cross-sectoral issue in trainings (on- and offline), especially for new employees <p><i>Ethics</i></p> <ul style="list-style-type: none"> - reinforce individual expertise 	<p>Increase <u>intrinsic motivation</u> to follow goals.</p> <p>→ Bring the goals together with the (personal) goals of the employees/ organization (ethics as part of "excellence").</p> <p><i>Gender</i></p> <ul style="list-style-type: none"> - Connect to the Fraunhofer goals (excellency, young talent [women], market success, USP) - Fraunhofer as a pioneer - integration in guiding principles, mission, Code of Conduct (identity change) <p><i>Ethics</i></p> <ul style="list-style-type: none"> - Reduce the goal conflict. <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - Cultural change at the institution level: a broader opening towards the public 	<p>The added value of achieving the goals should become clear to everyone</p> <p><i>Gender</i></p> <ul style="list-style-type: none"> - Added value is clear for everyone. - ,No benefit for me' – attitude does no longer exist. - full awareness of the relevance <p><i>Ethics</i></p> <ul style="list-style-type: none"> - strengthening individual expertise <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - Prove the added value of participative innovation processes through scientific surveys. - Track and show permanently the added value/impact of RRI-research through empirical surveys.

	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
	<p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - prove of added value of participative innovation processes through scientific surveys - Track and show permanently the added value/impact of RRI-research through empirical surveys. 	<ul style="list-style-type: none"> - Enabler: show relevance of participation at specific topics. <p><i>Open Access</i></p> <ul style="list-style-type: none"> - prominent advocates (realm of science) - scientist multipliers 	
	<p>Create the ability and space for meta-reflection of one's own actions. Recognition of one's own (responsible) decisions that are in conflict with external pressure such as deadlines</p> <p><i>Gender</i></p> <ul style="list-style-type: none"> - Overcome high pressure and lack of space for questions/reflexion <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - increase human resources, and resources in terms of finance and time (on all levels) - mobilize resources, distinct allocation of tasks and responsibilities 	<p>Competence development: Offer workshops, seminars and training courses for Fraunhofer employees</p> <ul style="list-style-type: none"> → Train possible experts/multipliers. → Question about the appropriate level: Where/How many experts for which field? Should everyone be able to do this or will a few experts within Fraunhofer be enough? <p><i>Ethics</i></p> <ul style="list-style-type: none"> - Strengthen individual expertise. 	



	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
	<ul style="list-style-type: none"> - Address fear of a slowdown of the research process. 	<p><i>Open Access</i></p> <ul style="list-style-type: none"> - competence development <p><i>Gender</i></p> <ul style="list-style-type: none"> - Establish a Fraunhofer-specific expertise (discipline & gender combined). - specific training especially for multipliers - Gender competence as a cross-sectoral issue in trainings (on- and offline), especially for new employees <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - Push competence development from pioneers (Fraunhofer UMSICHT, Fraunhofer CeRRI). - For competence development: development of transparent evaluation criteria of participation 	
<i>Culture</i>	<p>Take into account enablers, barriers and current public debates.</p> <p>→ Link up with existing Fraunhofer structures and ways of thinking and</p>	<p>Address conflicts with existing organizational culture: Conflict with (time) pressure and external regulation of research assignments</p>	

	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
	<p>extend them in the direction of the goals (e.g. in basic training for new employees, or further training for 'old' employees).</p> <p><i>Gender</i></p> <ul style="list-style-type: none"> - Connect to FhG goals (Excellency, young talent (women), market success, USP) - Establish a Fraunhofer-specific expertise (discipline & gender combined) - Specific training esp. for multipliers - Gender competence as a cross-sectoral issue in trainings (on&offline), esp. for new employees <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - Building on and advancing already existing RRI related knowledge and structures of FhG <p><i>Open Access</i></p> <ul style="list-style-type: none"> - competence development 	<p>➔ Include RRI topics in contract research (which often has different rules and wishes than RRI).</p> <p>➔ Be clear that RRI is a part of excellence and therefore important. Remind the client in a diplomatically way about that.</p> <p><i>Ethics</i></p> <ul style="list-style-type: none"> - Soften the goal conflict. <p><i>Gender</i></p> <ul style="list-style-type: none"> - Connect to Fraunhofer goals (excellency, young talent [women], market success, USP) - integration in guiding principles, mission, Code of Conduct (identity change) <p><i>Open Access</i></p> <ul style="list-style-type: none"> - standard publication process for all tools - integration of Open Access in science indicators 	

	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
		<p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - Refurbish and a better use of already existing knowledge of Fraunhofer structures and knowledge based on Societal Engagement 	
<i>Structure</i>	<p>Competence analysis: Which competencies are required to achieve the goals?</p> <p><i>Gender</i></p> <ul style="list-style-type: none"> - structured competence analysis <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - building on and advancing already existing RRI related knowledge and structures of Fraunhofer 	<p>Develop supporting materials (handouts/guidelines) where they make sense.</p> <ul style="list-style-type: none"> ➔ Identify clear fields of action, define the limits of the topics and goals. ➔ Create topic-specific, freely accessible databases. ➔ Fraunhofer can build up its own expertise. ➔ Develop clear, transparent rules and application standards. ➔ Develop position papers. <p><i>Gender</i></p> <ul style="list-style-type: none"> - Establish a Fraunhofer-specific expertise (discipline & gender combined). - Establish clear and transparent rules. 	<p>Re-structuring of the business model</p> <p><i>Gender</i></p> <ul style="list-style-type: none"> - Fraunhofer as a pioneer - Connect to Fraunhofer goals (excellency, young talent [women], market success, USP) - integration in guiding principles, mission, Code of Conduct (identity change) - Feed in dynamic organization. - budgeting for gender issues <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - cultural change on the institution level: a broader opening towards the public - mobilizing transition agents



	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
		<ul style="list-style-type: none"> - Provide easy accessible knowledge (guidelines & individuals). - GenderWiki (section among others for case studies) <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - Develop a joint handout from Fraunhofer CeRRI/Fraunhofer IAO/Fraunhofer UMSICHT - Position papers/White Paper (in linkage to strategic actions) <p><i>Ethics</i></p> <ul style="list-style-type: none"> - Identify clear fields of action, e.g. through strategic initiatives/position papers that take into account current public debates (e.g. position paper on the "future of work"). 	<ul style="list-style-type: none"> - Develop a Business-Case for RRI. <p><i>Open Access</i></p> <ul style="list-style-type: none"> - Transfer in the institutional structure. - Open Access specialist careers
		<p>Create a platform/network for the exchange of experience between the institutes/employees</p>	



	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
		<p><i>Open Access</i></p> <ul style="list-style-type: none">- Network. <p><i>Societal Engagement</i></p> <ul style="list-style-type: none">- Use the network as a platform for exchanging experiences between the institutes. <p><i>Gender</i></p> <ul style="list-style-type: none">- Genderpool database (searchable)	

	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
<i>Processes</i>		<p>Write and publish interim reports on (interim) successes</p> <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - Track and show permanently the added value/impact of RRI-research through empirical surveys <p><i>Open Access</i></p> <ul style="list-style-type: none"> - parameter monitoring of OA → brag, e.g. sustainability report <p><i>Ethics</i></p> <ul style="list-style-type: none"> - Promote activities with a „snowball effect“. - Launch public discourses. 	
<i>Interaction with the outside world</i>	<p>Cooperate with pioneering institutions</p> <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - development of strategic alliances for Societal Engagement outside Fraunhofer - exchange of experience with universities 	<p>Adapt and refine the website with regard to the goals (e.g. gender-sensitive language)</p> <p><i>Open Access</i></p> <ul style="list-style-type: none"> - digital implementation of Open Access infrastructure 	<p>Follow up the added value/impact of RRI research through empirical analysis</p> <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - Track and show permanently the added value/impact of RRI-research through empirical surveys.

	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
	<ul style="list-style-type: none"> - Push a network between active pioneer institutions. <p><i>Open Access</i></p> <ul style="list-style-type: none"> - expert associations as a driving force <p><i>Gender</i></p> <ul style="list-style-type: none"> - Establish competent cooperation partners. 	<ul style="list-style-type: none"> - integration of Open Access in digital business process <p><i>Gender</i></p> <ul style="list-style-type: none"> - Gender issues in combination with acquisition material is put online. - GenderWiki (section among others for case studies) - Call for gender sensitive language and images. 	<p><i>Open Access</i></p> <ul style="list-style-type: none"> - impact of Open Access <p><i>Gender</i></p> <ul style="list-style-type: none"> - Added value is clear for everyone. - GenderWiki (section among others for case studies)
	<p>Current state of research: Which knowledge does already exist (in the society and research landscape)?</p> <ul style="list-style-type: none"> ➔ Promote cooperation with universities and non-university cooperation partners. ➔ Search for “role models”: Which institutions have gone through processes similar to ours? 	<p>Define the impact of achieving the goals of FhG for the outside world</p> <p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - Prove the added value of participative innovation processes through scientific surveys. - Track and show permanently the added value/impact of RRI-research through empirical surveys. - (Involve citizens in strategic operations and processes of Fraunhofer). 	<p>Respect external pressure through regulation/ strict laws</p> <p><i>Open Access</i></p> <ul style="list-style-type: none"> - time management - contract structure <p><i>Gender</i></p> <ul style="list-style-type: none"> - External pressure (evaluation, regulation, cash flows) (<i>enabler</i>) - Lack of processes and routines (<i>barrier</i>)



	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
	<p><i>Societal Engagement</i></p> <ul style="list-style-type: none"> - exchange of experience with universities - Take on the dialogue formats developed in previous activities in the context of sustainability. - Push a network between active pioneer institutions. <p><i>Gender</i></p> <ul style="list-style-type: none"> - Establish competent cooperation partners. - exchange of experience with universities <p><i>Open Access</i></p> <ul style="list-style-type: none"> - prominent advocates (realm of science) - Pioneers identify testimonials. 	<p><i>Open Access</i></p> <ul style="list-style-type: none"> - impact of Open Access - integration of Open Access in science indicators - scientist multipliers <p><i>Ethics</i></p> <ul style="list-style-type: none"> - Promote activities with a "snowball effect". - Raise awareness. 	



	<i>Short-term</i>	<i>Medium-term</i>	<i>Long-term</i>
	<p>Why do students hardly have any gender/Open Access competence from university?</p> <p><i>Gender</i></p> <ul style="list-style-type: none">- "De-toxify Gender" (soften automatic rejection of gender topics) <p><i>Open Access</i></p> <ul style="list-style-type: none">- lack of scientists' knowledge (barrier)		