Final Documentation of activities and outcomes under the individual pilots

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1. Introduction

This deliverable presents the main activities undertaken until now within our project's four pilot regions: Cantabria, Karlsruhe, Tampere, and Szeged-Timisoara. In this process, each region has executed the activities both laid out in past deliverables as well as those that were developed throughout the duration of work package 4. This document presents these pilot actions. Each pilot action is structured into four different sections that aim to promote a characterization of the participants enrolled, the activities, a narrative description of the pilot activity(s) and as a reflection on the process. The questions posed in this template are aimed to document the process as well as reflect on it.

Prior to this report, pilot regions were actively encouraged to report their pilot actions immediately after they were conducted, during or even before the pilot action(s) took place. This final report embeds all these actions and analysis into one. This was completed as such so that to help identify where RRI-related actions defined in Work Package 3 could be embedded, adjustments made where further improvements were needed. These reports acted as instruments and reflection tools to help pilots identify implementation challenges and best practices in moving forward.

The goals for this effort have been to:

- Finalize documentation of activities and outcomes conducted in each individual pilot regions.
- Discover what concrete challenges local/regional stakeholders focused on during the pilot actions.
- Understand how each pilot action operationalized RRI to address regional challenges.
- Evaluate what the positive and negative outcomes resulted from the pilot actions.
- Compare regional activities, best practices, and challenges.
- Provide a learning tool to further improve action plans for the duration of the TetRRIS project moving forward.

While many of the pilot actions will continue after this report is submitted, these will benefit from the findings and learnings of this report. In the following section, we shortly summarize each regions pilot actions, key learnings, and challenges.

Tampere region:

The pilot actions, key learnings and main challenges for Tampere region are summarised in Table 1.

Table 1 Tampere region Action Plan + Follow-up Actions (WP4)

Drivers	• Sustainability and responsibility are seen crucial for the regions RDI • Strong co-operation culture exists among multiple actors. • Public initiatives include public engagement and stakeholder inclusion activities. • Various co-creation platforms have been established
Challenges	• Lack of practical know-how of RRI among regional actors • Lack of experience in implementing sustainability and responsibility strategies into practices • Achieving dialogue between the traditional innovation ecosystem and the manufacturing industry in the region

Solutions to challenges	• Concrete training activities, open dialogue, information sharing as well as sharing of good and also failed practices. • Regional development program • Collaboration between Tampere and Karlsruhe region • Corporate responsibility accelerator hub • Partnering with the SPRINT Innovation Festival 2021 and 2022 • Co-creation with Ekothon II event
Unique opportunity	• New regional plan, early 2021 • Small number of ongoing or soon to be launched promising processes and initiatives from a perspective of the project objectives. • Shift toward S4+ • Tampere pilot has already taken steps in promoting the RRI dimensions within the regional stakeholders through the programme preparatory process
Tampere desired impacts	• contribute to development of an innovation system, which while supporting renewal of traditionally strong manufacturing industry, would also be attentive to ecological, ethical, and social considerations in such a way that they are systematically integrated into innovation activities in the region • the RRI will be strongly integrated into regional development processes promoting sustainability through regional development work • sustainability promoted through industrial RDI ecosystem through which the RRI themes will be integrated into industrial RDI practices

Action Plan(s):

The actions planned and conducted throughout the last years in Tampere region is summarized in Table 2.

Table 2 Tampere region Pilot Actions updated 01/02/2023.

2021	2022	2023
Regional Development Program: intertwining with ongoing regional development program process, by enhancing RRI-dimensions. Final version of programme completed by end of November 2021 and enters into force at the beginning of 2022	Piloting of Corporate Responsibility Accelerator Hub, 2-5/2022	Concept note of responsibility accelerator in collaboration with Tampere and Szeged by 03/2023
Responsible and Sustainable Future workshop, 8/2021	The RRI Roundtable meeting 2022, volume 1, 6/2022	European cooperation: Exchange between Tampere- and Karlsruhe technology region is ongoing (2022-2023). *Specific events tbd 02-05/2023*
SPRINT innovation festival challenge competition, 11/2021	RRI (engagement) workshop in the High -Level Forum (HLF) with Karlsruhe pilot, 11/2022	Building a roadmap of the regional digital compass in Pirkanmaan liitto. *Specific engagement events tbd 02-05/2023*
1st RRI Roundtable meeting in Tampere, 11/ 2021	Tampere & Karlsruhe regional exchange meeting in Tampere, 11/2022 as part of European cooperation and the exchange between Tampere and Karlsruhe	4th RRI Roundtable event on 05/2023

	technology regions started in autumn 2021	
Ekothon II 12/2021	STRONG, STRONGER, RESPONSIBLE hybrid seminar in Tampere by VTT, 10/2022	
	SPRINT innovation festival challenge competition, 11/2022	
	RRI Roundtable meeting 2022, volume 2, 12/2022	
	The regional exchange with Tampere and Szeged-Timisoara, Hungary-Romania, 12/2022	
	Building a roadmap of the regional digital compass in the Council of Tampere Region	

Cantabria:

The pilot actions, key learnings and main challenges for Cantabria region are summarised in Table 3.

Table 3 Cantabria Action Plan + Follow-up Actions (WP4)

Drivers	• Set up the TetRRIS lab to promote RRI into S3 regional strategy. • Common presence of sustainability and responsibility notions in the regional innovation system • RRI awareness in some research actors closely related to RRI keys such as ethics or gender equality. • Keys such as public engagement, open access and/or science education not widely popular in R&I organizations in the region • Emerging actions around CSR, Social innovation, SDGs and social Challenges
Challenges	• Modest Innovation culture and cooperation culture (socio-cultural challenges). • Lack of an official open innovation strategy. • Lack of synergy between R&I stakeholders • Societal challenges in coming years related with rural depopulation, ageing, energy transition, post-industrialization and/or mobility. • Retention and attraction of talent
Solutions to challenges	1. Bio-health and post-covid19 society 2. Blue economy and fair energy transitions 3. Responsible industry 4.0 4. Territorial sustainability and responsibility
Unique opportunity	• The RRI vision projected in TetRRIS project in the region seems to be nicely aligned with what the policy making domain will try to aim during the period between 2021-2027
Cantabria desired impacts	• To position Cantabria TetRRIS Lab as a meeting point into the regional innovation ecosystem to stimulate a forum dedicated to the need of strengthening science-society interactions in the four domains of opportunity identified.

Action Plan:

Cantabria is different from the other regions as it develops its pilot activities following their social lab (SL) approach and builds on existing past and present initiatives in the region. Actions consist of 3 participatory workshops (starting in the fall 2021, ending in spring 2022). The actions planned and conducted throughout the last years in Cantabria region are summarized in Table 4.

Table 4 Cantabria Pilot Actions updated 27/1/2023.

2021	2022	2023
TetRRIS Cantabria Lab (WS1), October 2021	Co-Creation workshop (WS2), March 2022	
	Co-Creation workshop (WS3), June 2022	Policy Lab II, 8-10 February 2023
	Follow-up meetings, January 2022, April 2022	Policy Lab III, 4-5 July 2023
	Policy Lab I, 12-13 October 2022	Pilot 3: Digital skills training, continuation based on survey results
	In order to combine complementarities with the reflection process already existing in the region within the framework of reflection of the Smart Specialization Strategy of Cantabria (RIS3) in which the DG of Innovation leads Tetrris participates in the EDPs sessions https://www.cise.es/programas-para-emprendedores/ 21 June 2022, 30 Sept 2022, 28 October 2022	Pilot 4: Sustainability education and training, several events scheduled in 2023
	Pilot1: #ONEHEALTH CANTABRIA FORUM Leaded by the Innovation DG meeting in July with the Ministry of Health. Different meetings have been held with the Director general of Innovation of the Regional Government to launch a Health Forum in the region without specific results so far; conversations between the Regional Ministers of Health and Industry are being held.	
	Pilot 2: Sustainable consumption model based on technological alternatives; part of a bigger regional initiative funded by NEXT	
	Pilot 3: Digital skills training, The TERA Cluster (Information and Communication Technologies) has carried out a study in Cantabria on digital competences, actions in 2023 based on the results. The cluster will be responsible in developing a formal training on digital competences detected as necessary by the different members of the regional Cluster Sea of Innovation (marine and offshore energies' value chain). Different meetings were held between SODERCAN, and the TYERA cluster followed by meetings between TERA and the Cluster Sea of Innovation in order to design the specific and real needs of the latter in digitalisation training.	Training on digitalisation (cluster TERA as trainer and the cluster Sea of Innovation as trainee)
	Pilot 4: Sustainability education and training, several meetings with the	5 workshops on sustainability at different regional colleges, together

	chamber of commerce of Cantabria who is driving this idea. Specific offer from one specific stakeholder to implement a pilot action in the region, more specifically at colleges where 5 workshops are foreseen to promote education and training on Sustainability	with the regional Chamber of Commerce.

Karlsruhe:

The pilot actions, key learnings and main challenges for Karlsruhe region are summarised in Table 5.

Table 1 Karlsruhe Action Plan + Follow-up Actions (WP4)

Drivers	• Comparatively high level of de facto RRI practices • Long tradition of citizen and stakeholder engagement • Participation is a legal requirement in some contexts. • High interest in exchange of experiences and good practices • Strong recognition of the importance of public and stakeholder engagement and participation for social and technology innovation, and regional development, especially in the context of renewable-energy and sustainable-mobility related infrastructure build-out (well-run public engagement seen to reduce social conflict around build-out) • Social and political environment and culture broadly receptive and sympathetic towards RRI and related concerns
Challenges	• Existing de-facto RRI practices sometimes done in a rather ad-hoc and disjointed manner. • Few pre-existing structures for exchange of knowledge and experience and mutual learning regarding citizen and stakeholder engagement/participation (Note: this is also an opportunity for the TetRRIS project) • Limited insight into practices, activities, and experiences in other European regions • Little awareness of "RRI discourse" and a rather practically oriented culture that emphasizes immediate concrete outcomes and can be impatient with "academic theory." • Karlsruhe Technology Region (KTR) is characterized by a wide variety of technological, institutional, and sectoral structures that might impede RRI practices. In particular, the governance structures in the "KTR" are quite complex, as it cuts across and includes several different administrative districts in both Germany and France, which have equal standing within the KTR
Solutions to challenges	1. Creation of a practitioner network on citizen and stakeholder engagement and participation, targeted at innovation and development as well as civil-society actors within the KTR 2. Initiation of an intensified dialogue and exchange between regional innovation and development policy makers in Karlsruhe and Tampere
Unique opportunity	• Pre-existing de facto RRI practices and a culture receptive to the concerns and objectives of RRI • Growing emphasis on public engagement/participation in contemporary public discourse in Germany, especially • Clearly identifiable gap in the support services currently provided regarding participation/engagement issues
Karlsruhe desired impacts	• Strengthen the practical public engagement/participation-related "know-how" and awareness among innovation and regional-development actors in the KTR, to thus:

	o Directly: Durably improve public-engagement practices in innovation and development projects in the KTR o Indirectly: Improve innovation and development outcomes in general, and facilitate the build-out of renewable energy and sustainable-mobility related infrastructure by fostering better public-engagement practices and, thereby, reduced social conflict • Create new linkages among actors in the KTR around the topic of public engagement/participation. • Foster new linkages between Karlsruhe and other European regions to facilitate the exchange of knowledge surrounding the role of RRI in regional development, and regional development/innovation-related good practices in general

Action Plan:

The creation of a *practitioner network on citizen and stakeholder engagement:* In discussions with local innovation actors it became clear that a "safe space", where conversations on who conducts participation processes, uses them in their innovation projects to exchange experiences, discuss problems, and advise each other was needed and that could take place in a trustworthy, confidential environment, allowing actors to be open especially about failures, problems and challenges and get constructive feedback from their peers, could be of high value. The network is intended to fill this gap.

The initiation of an *intensified dialogue and exchange* between regional innovation and development policy makers in *Karlsruhe and Tampere*

The creation of a *mobility advisory council* (*Mobilitätsbeirat*): A way to further facilitate citizen and stakeholder input into regional mobility projects, priorities and strategies that emerged in TetRRIS dialogues with local innovation-system actors – akin to existing structures for energy sector development.

Note: The hoped-for pilot action "mobility advisory council" could not be conducted within the pilot time frame of the TetRRIS project. However, the Karlsruhe Mobility Lab with ca. 20 partners from local businesses, research institutions and public transport operators was established and presented during the IT-TRANS Exhibition in May 2022 in Karlsruhe. Since then, the term "Karlsruhe Mobility Lab" has become a well-established name in the mobility community in Karlsruhe and is constantly being expanded. The Karlsruhe Mobility Lab makes the regional mobility projects known in the public and is therefore an indispensable prerequisite to be able to discuss the RRI-aspects with all stakeholder groups within the framework of a future "mobility advisory council".

Table 2 Karlsruhe Pilot Actions updated 07/02/2023.

2021	2022	2023
Workshop: Citizen participation and living labs for new technologies in the Karlsruhe Technology Region; 07/2021	**Founding meeting** "Practitioners' Network for Citizen and Stakeholder Participation; 02/2022	**Workshop:** Citizen and stakeholder participation from the RegioWIN projects from the region; 03/2023
Kick-off Meeting online: Collaboration Karlsruhe & Tampere; 12/2021	**Workshop:** Successful project communication between marketing, co-creation and technology acceptance: the example of efeuCampus; 04/2022	
	Survey: The influence of RRI aspects; 04/2022	
	online Meeting: Collaboration Karlsruhe & Szeged-Timisoara; 05/2022	
	Workshop: Participation in practice - objectives, challenges and formats; 07/2022	
	High Level Forum: Together with Tampere Pilot hosting the workshop: "How can engagement enhance responsibility?"; 11/2022	
	Regional exchange meeting In Tampere between Tampere and Karlsruhe; 11/2022	
	Workshop: Conflict resolution in spatial innovations and large-scale technical facilities: Experiences and recommendations from practice; 11/2022	

Szeged-Timisoara:

The pilot actions, key learnings, and main challenges for the two running pilots (TalentMagnet and DIH world) in Szeged-Timisoara region are summarised in Tables 7, 8 and 9.

TalentMagnet

Table 3 TalentMagnet Action Plan + Follow-up Actions (WP4)

Drivers	• Currently, personal networks of local RRI experts are the main drivers in this region • Unfortunately, internal drivers to the implementation of RRI are very rare.
Challenges	• Lack of trust • Lack of cooperation willingness although economic cooperation through mutual benefit can create an economic surplus. • Low familiarity and exposure to RRI
Solutions to challenges	1. TalentMagnet
Unique opportunity	• Starting anew, introducing the concept to entire region from scratch

	• The RRI concept has been introduced to the participants and they were ready to discuss their experience which make it possible to identify areas of potential RRI actions. • The presented ongoing activities and planned actions of local stakeholders have already some elements of RRI included which can be further developed within the DIH-World project. • DUTIREG is committed to creating the roadmap for implementing Digital Innovation Hub in Szeged (which is a DIH-World result). It shall follow the open innovation process and public engagement shall be an important element (which is TetRRIS result) • The participants have learned about the good practices and practical examples from the West region which makes it possible to implement knowledge transfer from the town of Timisoara toward Szeged, including their agglomeration zones.
TalentMagnet	• Bring about engagement and knowledge of RRI concept

Action Plan:

Raise awareness of RRI in a post socialist innovation environment (starting challenge): the general knowledge about RRI issues in the post-socialist countries is very low, which statement is valid for the TalentMagnet partnership, too. However, their openness to be familiar with RRI issues has been tested and the result is very positive: based on a bottom-up approach TalentMagnet partnership invited TetRRIS experts for an online workshop about RRI in the close future.

Having TalentMagnet's steering committee meetings on the importance of RRI (raising awareness on RRI in the partnership)

An RRI training with TetRRIS

Creating RRI-related visuals (infographics, animations, leaflets) with easy-to understand key RRI-messages and advantages: This is a key activity, since visuals can help to summarize and understand the most important issues of RRI very quickly and efficiently. TetRRIS experts will develop and edit attractive RRI-related visuals. These visuals will be very important in the next activities.

Helping trained partners start to use RRI thinking during their work.

Ask TalentMagnet partners to distribute the importance of RRI among their stakeholders: After getting the RRI knowledge and understanding its importance and applying it during their work, partners will be asked to try to distribute the importance of RRI among their stakeholders. The helpdesk will help partners to do that if needed. RRI visuals will help this work.

Invite TalentMagnet key persons to main TetRRIS activities to continue cooperation and get more support.

Transferability of Open Access RRI Key: Transferability requires that the outputs of the projects are presented in a format that is easy to use and adapt by another beneficiaries.

Involving RRI keys and dimensions into the deliverables

D.T2.1.2 Local Talent Clubs established

D.T2.1.5 Urban hackathons implemented

Table 4 DIH-World Action Plan + Follow-up Actions (WP4)

Drivers	• West region is the model region in Hungary. • The first region in the country to develop regional innovation strategy (RIS) 2005-2008, 2009-2013 • Smart Specialisation strategy (S3) developed in 2013 → Promising for further development. • Exploring spill-over effects of some key enabling technologies – namely ICT
Challenges	• fully addressing and maximising the impact of the thematic objectives identified in the S3 process and translating the process into a manageable procedure involving all relevant regional players: industry, S&T, intermediary sector as well as regional authorities • Restricted resources • RRI is a new concept to the region
Solutions to challenges	• Development of an innovation ecosystem in Szeged • Cross-border approach, international cooperation: development regions led by Szeged (Hungary), Timisoara (Romania) and Novi Sad (Serbia) • Responsible innovation within ICC within Timisoara • Innovation in RIS3: Regional Innovation Strategy (RIS3) for the West Region of Romania, a Smart Specialisation Strategy under approval in Serbia, anS3 and several innovation-oriented organizations in Hungary
Unique opportunity	• First real opportunity to address RRI in the region and offer an impact path for the future
DIH-World	• Addressing and maximizing the impact of the identified thematic objectives in the s3 and translating the process into a manageable procedure involving all relevant regional players,

Action Plan:

The actions planned and conducted throughout the last years in DIH world and Szeged- Timisoara region are summarized in Table 8.

Creating RRI-related video material with easy-to understand key RRI-messages and advantages as communication actions that shall be continued after the completion of DIH-World project (May 2023)

DIH-World partner clusters shall distribute information materials about the RRI among their members followed by structured online discussions organized by new regional "TetRRIS Innovation Lab" following the model from Cantabria.

DIH-World partner clusters shall be invited to TetRRIS activities to continue regional involvement in transnational cooperation.

Integrating RRI in regional innovation services by DIH Business Plan

S3 training with RRI in focus – practical online education to cluster managers and economic development professionals organized following the model of TalentMagnet.

Integrating RRI in European DIH cooperation between Szeged and Timisoara – cross-border concept and pilot implementation following the model from Tampere

RRI community of professionals – supporting RRI with knowledge and experience generated by TetRRIS partners following the model from Karlsruhe.

Table 5 S-T Pilot Actions updated 18/1/2023.

2021	2022	2023
Local Talent Clubs established, December 2021		
Forum for projects by Territorial Innovation Platform on 8th November 2021	Foresight workshop on regional responsible innovation in Szeged, 8th December 2022	Concept note of responsibility accelerator in collaboration with Tampere and Szeged by March 2023
TalentMagnet's steering committee meetings on the importance of RRI (raising awareness on RRI in the partnership) 15th September 2021.	Online RRI training for TalentMagnet staff. During the 1,5-hour training, we had 18-22 participants. 18th February 2022	Partner clusters in EPIX project shall be invited to TetRRIS activities to continue regional involvement in transnational cooperation from February 2023
Creating RRI-related visuals (infographics, animations, leaflets), October – December 2021	Involving RRI keys and dimensions into the TalentMagnet deliverables: D.T2.1.5 Urban hackathons implemented, June 2022	S3 training with RRI in focus – practical online education to cluster managers and economic development professionals, from March 2023 – 3-month online training (planned twice yearly)
DIH Online workshop on 16 September 2021:	Involving RRI keys and dimensions into the TalentMagnet deliverables: D.T2.1.2 Local Talent Clubs established	RRI community of professionals – supporting RRI with knowledge and experience generated by TetRRIS partners, start of networking function from April 2023
Invite TalentMagnet key persons to main TetRRIS activities in order to continue cooperation and get more support 19th October 2021	Integrating RRI in regional innovation services by DIH Business Plan, Nov. 2021 – April 2022 partnership with regional stakeholders / May 2022 – Initial start of DIH functions / April 2023	Integrating RRI in European DIH cooperation between Szeged and other DIH-World partners for joint projects in Horizon Europe April 2023
Creating RRI-related podcasts and video material with easy-to understand key RRI-messages and advantages, November 2021 – August 2022	27/10/2022 – 1st workshop for Chemist talents	International Community Day by DIH-World partners where DIH Business Plan for Szeged is presented officially by May 2023
DIH-World partner clusters shall distribute information materials about the RRI among their members followed by structured online discussions, Oct.-Dec. 2021 – distribution / Jan.-June 2022 – follow-up online discussions	31/10/2022 – 1st workshop for Economist talents with Emad Yaghmaei's RRI keynote	
	03/11/2022 – 2nd workshop for Chemist talents	
	14/11/2022 – 2nd workshop for Economist talents with Krisztina Kádár's CCU keynote	

	21/11/2022 – 3rd workshop for Economist talents: RRI and CCU debate day1	
	28/11/2022 – 4th workshop for Economist talents: RRI and CCU debate day2	

In the following sections each studied region (Tampere, Cantabria, Karlsruhe and Szeged-Timisoara) present in detail the pilot actions that were conducted, describing the participants enrolled, the activities, and reflect on the process.

II. Tampere region

The vision of the pilot in the region of Tampere was based on the actions promoting sustainability and integrating RRI themes in the regional innovation ecosystem, especially in the regional strategical processes including the Regional Development Programme and Smart Specialisation Strategy. As the regional development strategies continue to shift towards strengthening the sustainability transition, and as the upcoming smart specialization strategy shifts towards the concept of S4+, embedding the RRI dimensions deeper into the regional innovation system will become more important and visible. The TetRRIS pilot anticipated these changes and aided with the transition.

The Tampere pilot also recognized that the traditional innovation ecosystem cannot drive the responsible sustainability transition alone without including the region's biggest economical actors, namely, the manufacturing industry. Thus, the pilot was divided into two spearheads, other focusing more on the regional development processes and other on manufacturing industry's ecosystem and processes (see Figure 1). The spearheads supported each other and had a strong linkage through continuous dialogue during the project's lifecycle. The overall vision of the pilot was "to create a cohesive, responsible and sustainable regional innovation system that works in a cooperation towards building a better future for the region".

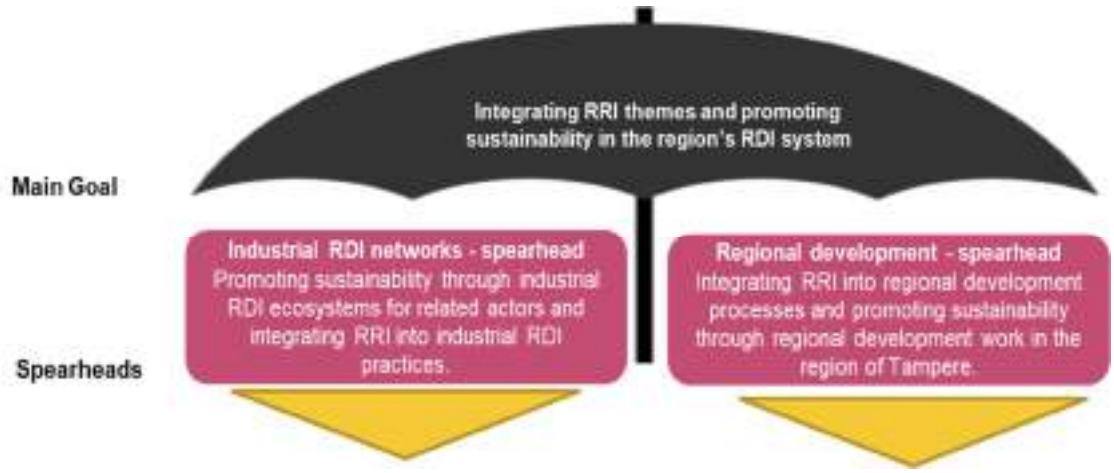


Figure 1 The spearheads and the main goal of the pilot

To answer the two targets, the Tampere pilot organized 16 actions (see **Error! Reference source not found.**2) that included variety of participatory activities, like workshops, roundtable discussions, student workshops.

The actions planned in the beginning of the project took place mostly as planned, and besides these, the pilot also ended up covering e.g., wider cross-regional collaboration and RRI-focused research collaboration. As the project reaches its end, it can be concluded that the challenges and opportunities recognized in the beginning of the project are still relevant, but concurrently a considerable progress in the sustainability and responsibility thinking in the region is taking place both due to the change of operational environment and the initiatives of the project.

The actions are introduced in detail in the order of occurrence in the Tampere Pilot region.

1. Pilot actions

1 The regional development program

The Council of Tampere Region launched a preparation of new regional program in the early 2021, which provided a good opportunity for the Tampere pilot to first introduce, and second, enhance sustainability and responsibility views in an institutional setting of a regional development. The pilot enhanced RRI dimensions within the dialogue between the regional actors and promoted open access and inclusivity between different ecosystems.

Model of doughnut economy combining the concepts of planetary boundaries with the social boundaries was used as a framework in the new program. Despite the strong regional strategic focus on sustainability in the Tampere pilot, most environmental impacts are foreseen to be indirect via improved understanding of responsible and sustainable business, for example in small- and medium-sized manufacturing companies. Tampere Pilot has created impacts to regional policy by successfully engaging in local strategy process, namely in the development of regional development program. It was the first time such intervention was made locally that aimed to integrate responsibility among sustainability in the strategic decision-making. In line with this aim, responsibility and sustainability are cross cutting the new regional development program published in the end of 2021.

The Council was responsible for the process. It aimed to include all the relevant regional stakeholders in the process either via a survey or by invitation to the series of workshops in which topics and actions of the regional strategy were discussed. The stakeholders included cities and municipalities of the region, research and development organizations like the Tampere University and Technical Research Centre of Finland, representatives of business and industry like local business associations and major firms, various expert organizations, and civil society associations. Altogether in the workshops participated 70-80 representatives of organizations. The project group does not have detailed lists of the participants.

The action aimed at to introduce and strengthen responsibility and sustainability related agenda and topics in the regional development strategy. The aims were pursued by actively participating in the process and supporting the uptake of relevant topics and aspects in the preparatory process and in the strategy itself.

The strategy process was identified by the project team as potential and promising way of introducing responsibility and sustainability related issues in the policy agenda of the region. The project partners of the Tampere regional council discussed internally in the Council on the possibilities to link in the process. In practice, this meant number of internal preparatory discussions with the persons responsible for the strategy preparation in the Council on various ways how sustainability related aspects could be integrated in the process e.g., in the conducted survey and workshops.

The strategy process led by the Council of Tampere Region begun in the spring 2021. The TetRRIS pilot team was present in every step of the strategy process, and at least two team member was present in the three strategy workshops (13 April 2021, 27 April 2021 and 11 May 2021). The pilot team also helped to design the online survey that was sent out (24 March 2021) to the whole regional innovation ecosystem organizations reaching 247 replies. The team embedded the RRI dimensions into the survey and helped to clarify the sustainability aspects of the survey. Along with the RRI dimensions, the pilot provided the

regional development program planning officer adequate information about the appropriate SDGs and how to further embed them into the program, equally in respect to the S4+ development.

Especially the strategy workshops where places were sustainability and responsibility related topics and themes were discussed widely. All the stakeholder participants were very active and usually it did not require any introduction of sustainability related themes or perspectives when, for instance, regional transportation or innovation related themes were discussed. The participants were very conscious of the rising significance of sustainability and responsibility. However, number of more traditional development views were also presented focusing solely on economic development and more traditional welfare aspects. In these cases, project group members actively introduced and picked up to the discussion complementary views from responsibility and sustainability related topics. While none of the sustainability and responsibility related themes were rejected, on the contrary they were considered important, they seemed sometimes for some participants more rhetorical and instrumental than as an important target as such. Despite this, the process was fruitful and managed to introduce for the first time a more sustainability oriented regional strategy for the Tampere region.

The regional strategy reaches to 2025 and the Council follows how it has been implemented and how it has affected to the regional development efforts as well as regional actors´ target setting and operations. It is not in the reach of the project group to arrange any follow up of the regional strategy.

2 Responsible and Sustainable Future workshop

To enhance public engagement, transparency, and stakeholder inclusion the Council of Tampere Region and VTT organized in cooperation "Our Common Responsible and Sustainable Future: Co-creating a future vision through the upcoming Regional Development program and Smart Specialization" online workshop on 24th of August 2021. The workshop was centered around the Regional Development program's mission "Tampere region business-sector has a positive handprint". The event took place while the preparation of the Regional Development Program for 2022-2025 was still underway. Therefore, the workshop provided an opportunity to collect inputs and views from a wider group of stakeholders strengthening strategy work and the preparatory process of the development program. The purpose of the workshop was to reflect on the future of the region from the perspective of the sustainability transition, with a particular focus on building a sustainable vision for the future of business and industry in Tampere region. As such, the workshop was an action to strengthen connection between the two spearheads of the Tampere region pilot: one focusing more on regional development processes and other on the region's strong manufacturing industry ecosystem and processes.

The action pursued related to several objectives in the Tampere region pilot: (1) to enhance open access and public engagement on strategical level within the region, in particular relation to the Regional Development Programme and S3 processes; (2) to foster a dialogue between the traditional innovation ecosystem and the manufacturing industry's ecosystem centred around RRI themes and the regional sustainability transition, and (3) to advance regional systemic thinking, public engagement, and open access through a dialogue between the sectors. A workshop bringing together people from public and private sectors to discuss how to promote sustainable transition in regional development and business activities contributed to these objectives of the pilot. The workshop also worked as a testing ground for future workshops to promote awareness of the RRI dimensions and sustainability aspects in regional cross-sectoral development.

Implementation

Preparation of the late-August workshop were started in Spring 2021. Focus of the workshop was discussed in joint meetings of the Tampere pilot team and with stakeholders with close connection to (manufacturing) industry in the region (e.g., representatives of the national Sustainable Industry X – initiative and Business Tampere). The aim of the workshop was to collect stakeholders' views on the following questions:

- How can we get to a situation where business in the Tampere region has a positive handprint on sustainable development?
- What do businesses need from regional decision-makers and the public sector to make this possible?
- What kind of cooperation should exist between different actors?
- How should different actors, sectors and industries innovate?

The workshop targeted a wide stakeholder group to reflect together and have an anticipatory future dialogue on how to promote, build and vision the sustainability transition in Tampere region. Invitation to participate in the workshop was sent in the beginning of July 2021 to a list of invitees who were identified in discussions with stakeholders and internal TetRRIS' Tampere pilot project meetings. A particular aim was to bring around the common virtual table a diverse group of people from business and industry sector, business lobby organisations, regional government, and higher education and research. Some of the participants in the workshop were/have been involved in other TetRRIS activities prior and after the workshop while there were many who hadn't participated in TetRRIS activities before the event. Altogether, 29 participants attended the workshop.

Working in small groups was chosen as a workshop method to help stimulate and encourage dialogue between participants. A script for facilitation were prepared in advance. The instructions supporting implementation defined for each phase of the workshop timing, tasks involved and questions/subjects to remember also including suggestions how to create psychological safety in a group.

The workshop took place in Zoom and was hosted by the pilot partner from the Council of Tampere Region. The program of the virtual event consisted of two interlinked parts. The event started with four presentations reflecting on sustainable transition and on-going actions linked with the development from different angles. The presentations had been selected to give the participants a systemic picture of how the sustainability transition is promoted at different levels of the society. The speakers presented the Ministry of Finance, Finance Finland, the Council of Tampere Region and Kiilto Ltd, an international family-owned company originating from Tampere region.

After the presentations, the actual workshop section begun. The participants were divided into small groups to discuss the region's common responsible and sustainable future. The subject was approached through ecological handprint thinking; by when could the region's business- and industry sector have a positive ecological handprint and what does this require, how can this be achieved? Each group was asked to approach the topic from a particular perspective; an industry/practical perspective, a societal/responsibility perspective, a business perspective, a scientific community perspective and a regional developers' perspective. Mural online collaboration tool was used to support small groups working in virtual space.

Many groups stated that, at least in terms of the carbon neutrality target, Tampere region is more ambitious than the national target and the region could achieve carbon neutrality as early as 2030 (national goal for carbon neutrality is set by 2035). It was, however, noticed that building a sustainable future requires more systemic and cross-sectoral cooperation, dialogue, and new partnerships. All actors in the region must be committed to a common mission objective to achieve it within the target time.

In addition, discussions highlighted the fact that, although the transformation of sustainability in the region presents challenges, there are also many new opportunities to increase the vitality of the region. The region's pioneering role in the sustainability transition was considered important. The workshop's discussions also highlighted the importance of the sustainability transition and the societal responsibility of the innovations and measures that promote it.

Each small group had a designated facilitator(s) from the organizing side to support the discussion and encourage participants to use and record their views in Mural online whiteboard. In addition, discussions and results of group work were followed and recorded by a visual storyteller / art-based facilitator in an engaging way (see Figure 2). The visualization summarizes the small groups' discussions on the desired change towards a sustainable future, its enablers, challenges, opportunities, and cooperation.

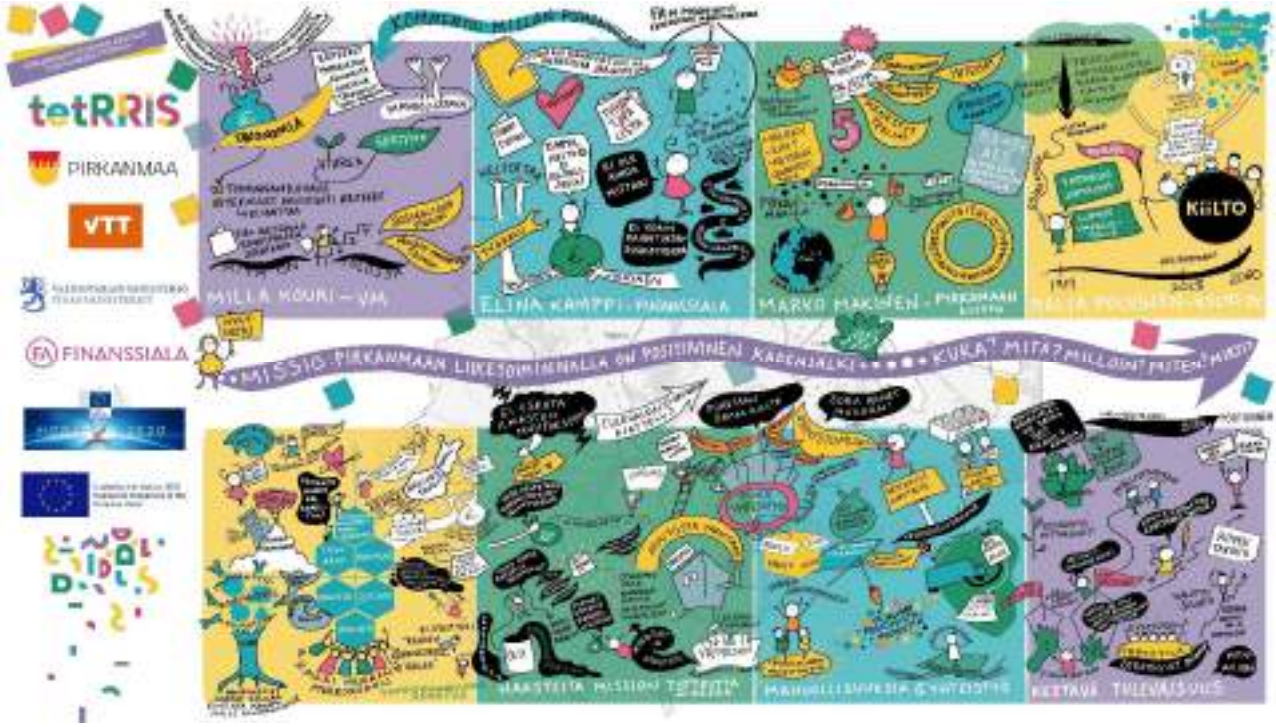


Figure 2. Recording of the workshop through visual storytelling by Raakku.co. Upper part of the picture summarises the content of the presentations. Lower part of the picture shows results of the group work on how to achieve the mission of 'Tampere business-sector has a positive handprint'.

After the workshop feedback were collected from the participants through a web-based event management system. The topic of event, presentations and the facilitation of the workshop section received good feedback from the participants. Some comments would have liked to have seen more participation from industry.

3 SPRINT Innovation Festival 2021

There is a growing need to get multidisciplinary experts to work in the manufacturing industry to answer the needs of sustainable industrial renewal as well as industry continuation and competitiveness in the region. The pilot action has recognized inclusiveness, including diversity issues, as an important factor for the challenge to be resolved. In the discussions with manufacturing industry ecosystem representatives from national Sustainable Industry X - SIX Initiative and Business Tampere the growing challenge facing industry – how to attract young people towards studies and future careers in the field of manufacturing industry – was raised as a critical matter. The Tampere pilot together with SIX Initiative and Business Tampere saw an opportunity to participate as a challenge partner in the Sprint Innovation Festival that combines the sustainability agenda with a large stakeholder engagement focusing on students. Sprint Innovation Festival is organized annually by the Tampere university community (incl. Tampere University and Tampere University of Applied Sciences).

Together with stakeholders, we assessed that student as the future workforce, are well positioned to develop new and sustainable ways to meet the manufacturing industry's challenge of attracting a skilled, diverse workforce in the future. Actual decision to participate was left to individual students. Each participating organization was asked to deliver a short description of their challenge well in advance. Students interested in to participate in Sprint festival selected then the challenge they wanted to work on. Participation gives the students opportunity to network, test and show their skills and in addition earn study credits.

Close collaboration with the Sustainable Industry X (SIX) initiative and Business Tampere as co-owners of the challenge supported the pilot's aim to push the RRI agenda forward through the recognized challenges in the region. The joint effort boosted systemic thinking and co-creation among participating organisations and was a concrete action to engage actors from manufacturing industry's ecosystem with the RRI questions. At the same time, the SPRINT event offered a platform to collaborate with the university community and students. Wide based cooperation in implementation advances regional systemic thinking, public engagement, and open access through a dialogue between the sectors.

Planning and implementation

The decision to participate in the InnoSprint challenge goes back to spring 2021, when the project team looked for cooperation opportunities with industry on RRI in Tampere region. We were interested in to find an industry relevant systemic challenge that requires a public private collaboration. In the discussions with manufacturing industry ecosystem representatives from national SIX Initiative and Business Tampere the growing challenge facing industry – how to attract young people towards studies and future careers in the field of manufacturing industry – was raised as a critical matter that could get major benefit from the Sprint Innovation festival where students are involved in creating innovative solutions to challenges. Further actions were taken to contact the Sprint Innovation Festival organizers. It was also decided that the challenge would be formulated and given to the event as a collaboration activity between the tetRRIS Tampere pilot, SIX and Business Tampere. Representatives from all partnering organizations took part in planning the final challenge and the precise description of the challenge was formulated in an online workshop meeting held in August 2021.

The innovation festival week follows a tested structure and schedule. This time because of the Covid restrictions, the event took place in virtual format. At the beginning of the festival week on Monday, the

Tampere region pilot team introduced the challenge to 34 students (16 females, 18 males) who were interested in the challenge. It turned out that the challenge was among the five most attractive challenges in the SPRINT innovation festival in the 2021 event.

In the challenge, we emphasized how the need for multidisciplinary experts is growing in the manufacturing industry and how the industry could benefit from inclusive approach in attracting future talents. As a food for thought, we also discussed how the manufacturing industry is already producing sustainable solutions and how attracting people with diverse backgrounds and skills could further increase the development of manufacturing industry to more responsible and sustainable. Participants were encouraged to think about solutions to the manufacturing industry's recruitment and skills challenge especially from student perspective. In addition to the introductory material, we shared students a non-exhaustive list of relevant sources of information to start with.

With the information as a source of inspiration, the students, divided into five multidisciplinary groups, put their minds and skills in use for the rest of the Sprint week in developing their own solutions to answer the challenge with the help of coaches and mentors. Also, the Tampere region pilot team in a challenge owner role had a chance to coach teams during the week.

The organizer had arranged pre-event orientation for students to support team building and having opportunity to get to know team members. During the first and second day, each team created a work plan, defined the problem to solve, gathered information and ideated alternative approaches to the challenge. On the second day, there were organized a question session during which the student teams had the opportunity to ask additional information about the challenge from the pilot team members participating in the meeting. Day after, each team presented their top 3 ideas and got feedback from our side to help them to focus their efforts during remaining days of the festival. The student teams were also mentored by one of the challenge owners. On Thursday, the teams were busy with developing their solutions, building, and rehearsing the final presentation, as well as finalizing the report on the work done.

In the final stage of the Sprint Innovation week, ideas were presented in a pitching session by all five teams to a jury presenting the challenge owners (incl. representatives of the Council of Tampere Region, the local Chamber of Commerce, a large international manufacturing company operations in Tampere and TetRRIs pilot team). The winning team proposed a comprehensive approach which included elements in raising awareness towards the manufacturing industry from kindergarten to graduate degree. In their solution, special attention was paid in social media opportunities in breaking the old-fashioned mental images strongly linked to the manufacturing industry and in reaching the right target groups. The winning team had recognized that manufacturing industry is especially lacking the ability to attract women. In addition, their solution embraced diversity, and emphasized the co-operation between schools and manufacturing industry companies. Finally, the great importance of qualified student counsellors and their role in motivating students was brought into daylight. It was seen important that the development of manufacturing industry should be made visible not only to the students but also to the student counsellors to spread diverse and up-to-date image of the industry.

As a part of the follow up, the event organizer delivered us a compilation of the solutions proposed by the five student teams to the challenge. The ideas put forward were then went through more in detail in two internal meetings with the other challenge owners (SIX Initiative and Business Tampere). As the role of student counsellors were highlighted by the students, we carried out an additional interview of a counsellor to broaden the perspective on current situation in counselling of young students in basic education/high school.

The pilot action was drafted with idea to have potential input to an on-going project called "Konepajakoulu 2.0" in Tampere region. The project funded by the Council of Tampere Region and Business Tampere had studied the needs of regional industry, especially local work machine manufacturing, concerning the future employee and education needs and was during the pilot action tailoring a new type of training solution to be implemented in the region. SIX initiatives had also been involved in the project. Thus, thanks to the partnering organisations the results of the challenge competition were directly available in planning of the future work of Konepajakoulu 2.0.

4 The RRI Roundtable meeting 2021

The initiative to set up a RRI Roundtable meeting for regional RRI related project was need-based as it was realised that regional RDI actors are involved in multiple responsibility related projects, but information and knowledge does not transfer in an effective way either between the projects inside or between organisations. Thus, RRI roundtable meeting series was established to facilitate this information flow and identify common interests of projects.

The 1st RRI Roundtable collected seven regional RRI projects which are managed by three institutions, namely VTT, University of Tampere and Council of Tampere Region. The aim was to start with projects and institutions that were known to organisers and enlarge the participation in the forthcoming events with snowball method. The1st meeting was kept on purpose relatively small to kick off the activity. The 1st RRI Roundtable meeting had 14 participants.

One of the objectives of Tampere's pilot activity intended to raise awareness of sustainability and responsibility in regional RDI community, and RRI roundtable as an established structure, and given that 2 follow-up meetings are organised, facilitated needed information sharing between RRI actors. The second objective of the meeting was to co-create content to the upcoming Ecothon event in December 2021 that Council of Tampere region was preparing.

Preparation of the 1st RRI Roundtable started in September 2021, as an initiative of Council of Tampere Region. The design of the meeting was developed together with VTT tetRRIS team and Council of Tampere Region. Personal invitations were sent in the early November 2021 with an aim to forward the invitation to interested parties.

> Welcome to the first meeting of the RRI Roundtable initiative. The initiative will provide a platform for dialogue and cooperation for the regional and perhaps national RRI- projects and specialists. The language of the first meeting will be Finnish, but we can make arrangements and accommodations for the English-speaking participants if necessary. It has been planned that the following RRI projects and their representatives are invited to the first meeting: tetRRIS, MARIE, Co- Change and Gender sti. However, as of now it seems that there is still room for a few more participants, so representatives from other projects may join as well.
>
> A private room has been reserved for us in the Grand Hotel Tammer. The hotel's buffet breakfast will take place from 7 to 10 am. Please make sure that you arrive in time. You can add your dietary requirements in the registration.
>
> The agenda of the meeting will be specified later. You can register for the meeting here by 6 pm on the 10th of November: https://www.lyyti.in/RRI-Roundtable1

Since the aim of the first meeting was to get to know each other, the 1st RRI Roundtable meeting was organized face-to-face as breakfast meeting in Tampere to keep a relaxed atmosphere. Second important

objective of the meeting was to design together format and continuation of the RRI roundtable meetings, given that need for common discussion on RRI was identified among RDI organisations in the region.

The meeting started with participants brief introductions and the project/ projects that they're involved in and how these projects are pushing the "RRI transition" forward in their own innovation ecosystems. A lively discussion followed as it was learned that many projects did have similar goals and objectives that facilitated collaboration and need to exchange learnings also in future.

The second topic of the meeting was to discuss the concept and format of the initiative -how could we make it beneficial for everyone involved. The concept of RRI Roundtable was agreed a valuable concept to continue, and even enlarge in the future.

Figure 3. Questions for brainstorming

The third topic was to explore how to take the RRI- dimensions into the grassroot level dialogue that related to an upcoming Ekothon 2- event. Ekothon provided an opportunity to take the responsibility dialogue to the grassroot- level and enhance citizen engagement in the responsibility thematic.

The meeting guided the future of RRI- engagement through different projects and how can projects and involved RDI experts potentially aid each other: for instance, recognize similar challenges, exchange best practices, and so on.

Figure 4. Participating projects

The host of the event sent a feedback questionnaire, and presentation slides were distributed to all participants. As mentioned, RRI Roundtable meetings was designed to be a meeting series which materialised and envisaged to continue beyond tetRRIS project.

5 Co-creation with Ekothon2

The Ekothon2 was a two-day co-creation online event (a hackathon) that enhanced public engagement with the civil society and the grass- root-level actors of the Tampere region (1-2 Dec 2021). The event included co-creation workshops where the participants mostly worked in groups to develop ideas on making real-life sustainability projects more successful. The participants were able to choose from 6 different project groups that span from very local sustainability grassroots initiatives to larger scale regional initiatives. The aim was to develop projects and funding opportunities for the projects. The event was organized together by the Council of Tampere region, STUE from the Tampere University, VTT and Konsulent Stiller-Reeve.

The TetRRIS project prepared the RRI themed questionnaire and responsibility guidelines for the workshop facilitation of the Ekothon2 workshops in co-operation with the EU projects CoChange and MARIE. The event also served as a test platform for the questionnaire and the guidelines.

The responsibility questionnaire supported and directed the participants to take into consideration RRI-related issues. The questionnaire topics included two main themes:

- Gender equality and social equality; with questions such as
    - How does your initiative strengthen a culture in which everyone feels involved and valued?
    - How is gender equality considered? Can your initiative strengthen gender equality? How?
    - How does your initiative promote equality?

- Societal interaction and inclusion; with questions such as
    - Which stakeholders should be engaged? Why?
    - Could your initiative influence political decision-making? How?
    - Can anyone participate, or is participation limited? Why?
    - Who should the communication be directed at? How to ensure that the right target groups are informed of the activities?
    - How do you ensure open access to the activities and the results?

The Ekothon2 event was open for everybody: representatives of local municipalities, politicians, artists, researchers, entrepreneurs, activists, and regional developers. The event looked especially for people that are interested in sustainability transition and cross-industrial sprint. Together, 51 participants from different organizations (academia, public, private, and non-governmental organizations) took part in the event.

The Ekothon2 event introduced the RRI concept to the grass-root level, and thus it contributed to the Regional development spearhead of the pilot of Tampere region, by integrating RRI into regional development processes and promoting sustainability through regional development work in the region of Tampere. Feedback for the questionnaire was good, and the questionnaire can be used for other purposes, in other events, as well.

Preparation and implementation

The preparation phase included the identification of the project initiatives that the participants worked with in the event.

The event was conducted through ZOOM and lasted 5 hours each day, from 9:00 to 14:00. The event comprised of group workshops in which participants collaborated to generate ideas to enhance the efficiency of ongoing sustainability projects. The primary objective of the event was to create sustainable projects and identify funding opportunities for them. Participants could select from six distinct project groups ranging from very local grassroots sustainability projects to bigger scale regional activities, namely:

1. Karkku library as a community centre
2. Pirkanmaa's (Tampere region) co-operative cultural centres
3. Pirkanmaa's Doughnut coalition
4. Korento Nature School and innovations in nature education
5. Tampere University researchers collaborating at the grassroots.
6. Pirkanmaan Kaarikoirat Ry and community in skateboarding

Each group was facilitated by experienced facilitators who had been trained in the Ekothon method.

Figure 5. Flyer of the project group number 3, the doughnut coalition of the Tampere region (Pirkanmaa) (source: https://projects.tuni.fi/ekotransitio/tapahtumat/ekothon/)

The participants worked with the six projects, with a greater aim of building a co-creational culture in the region, that motivates people with similar interests to come and work together, and to strengthen the co-creational networks that are needed in the sustainability transition.

A guidebook has been prepared for regional actors that would like to organize similar kind of hackathon events. The guidebook is available at: https://www.ecowelfare.fi/wp-content/uploads/2022/05/Orsi-ekothon-opas.pdf

6 The Corporate Responsibility Accelerator

The Corporate Responsibility Accelerator is a series of four half-day workshops targeted at manufacturing industry SMEs that are either just starting out, or already developing and designing their next steps towards responsible and sustainable business. The Corporate Responsibility Accelerator was developed and piloted in the spring 2022 together with five companies of the Tampere region. The pilot was developed, and the workshops were facilitated by the experts of VTT and 4Front, a Finnish-based consultancy company.

The accelerator was open for SMEs of the Tampere region that had acknowledged the need to develop their corporate sustainability measures and wanted to investigate the possibilities of sustainable business. The companies that participated had not been involved in the TetRRIS activities prior the workshops.

The companies were small and mid-sized companies from the Tampere region. They came from the following industries: chemical product production, handling gear production, foundry, furniture production, and food package production. In total, seven participants from five companies took actively part in the

workshops (i.e., more than two of the events). Two people among these companies took part in only two of the workshops. The roles of participants were sourcing manager, environmental engineer, two CEOs, sales manager, quality and environmental manager, financial manager, and communications manager.

Two company representatives that first enrolled to the accelerator could not join the workshops at all. One of these was looking for a more advanced level approach to sustainability than the accelerator offered.

In terms of the Tampere pilot and its goals for development, this action related to the Industrial RDI networks spearhead, as it promoted sustainability amongst SMEs and integrated RRI into industrial RDI practices, helping companies understand what the sustainability transition is about and get going with the development in their business.

Design and implementation

The Corporate Responsibility Accelerator was formulated by VTT and 4Front as an answer to the needs brought up in the discussions with the representatives of the manufacturing industry ecosystem (the regional Smart Manufacturing Hub, national SIX Sustainable Industry X Initiative, and Business Tampere, the economic development agency of the Tampere). It was seen that SME's and mid cap companies lacked the possibilities to get concrete help and support in developing their corporate social responsibility activities. Prior the kick-off and the workshops, VTT and 4Front experts met several times to plan for the contents of the accelerator meetings.

The accelerator concept was marketed on the VTT website (https://www.vttresearch.com/fi/uutiset-ja-tarinat/vahva-vahvempi-vastuullinen-yritysvastuun-kiihdyttamo-2022) where there was an open call for interested, Tampere region based, companies. Moreover, the invitation was shared through LinkedIn and Twitter, and through e-mails.

The Corporate responsibility accelerator included six meetings with the participants, with the following themes and workshop topics:

Figure 6. Meetings of the Corporate Responsibility Accelerator

As the Corporate Responsibility Accelerator was organized during the time of Covid19 epidemic, the meetings were organized in a hybrid mode. Two of the workshops were organized also physically, at the

VTT office in Tampere, but only one of the participants chose to come to the office, and the rest of the participants took part online.

The workshops included presentations on the key topics, and workshop working in smaller groups of companies and a facilitator. Participants were also given preparatory exercises prior workshops.

The workshops offered companies information of the key concepts of sustainable development and corporate sustainability, the trends around the development, and tools that support their development, and through bringing companies together in a workshop setting, giving the companies possibility to share and learn from another.

The Accelerator focused on the following themes: changes in regulation, trends of the operational environment, key areas of corporate responsibility, and opportunities for business development, such as circular business models. For companies, the most important take-aways of the accelerator are tools to evaluate the strategic direction of participating companies, analyze the needs of main stakeholders, conduct materiality assessment, map central risks and opportunities in business development, and draft responsibility goals and roadmaps.

After the fourth workshop, the participants were asked to give feedback for the accelerator with an online feedback form. The participants' experiences and feedback were also discussed in the closing meeting.

The experiences of the first accelerator were excellent: Every participating company was happy to recommend the accelerator to other companies. The workshops helped the companies in increasing understanding of the current state of their responsibility work and offered concrete ideas and tools for continuing the work. According to the feedback, the limited number of participants, regular meetings and assignments together formed an approach that both participants and the organizers felt was effective.

The best results of the accelerator are achieved when the participating companies have a willingness and a drive to create change, as well as the opportunity to take the new ideas into a wider conversation within their companies – as the themes and development needs of corporate responsibility touch all levels of an organization. Therefore, it is good if the participants of the accelerator have time and the possibility to discuss the ideas and learnings of the workshop meetings with their colleagues between the meetings, and thus share the information on sustainability and get also their colleagues committed to the development. Therefore, two to three weeks between the meetings is a minimum, so that participants have the time to have these discussions and perhaps take the ideas to the decision-making process needed.

Covid19 epidemic challenged the organizing of the accelerator as during the spring 2022 companies were just starting to open their offices but many employees still preferred working from home. Even though participants appreciated and looked forward meeting others and sharing discussions face to face, and the possibility of workshopping in the Tampere office was organized for two of the meetings, participants preferred joining the workshops online.

7 The RRI Roundtable meeting 2022, volume 1

The RRI roundtable was designed to be a meeting series, and the second meeting was organized to meet the needs identified in the region. It was realized that regional RDI actors are involved in multiple

responsibility related projects, but information and knowledge does not transfer in an effective way either between the projects inside or between organisations.

The objectives of the second meeting were 1) to intensify understanding RRI project contents, to hear the news and ongoing actions and have time for the general discussion about the RRI- dimensions through the projects; and 2) brainstorm the High-Level Forum workshop (https://hlf-giant-grenoble.org/) that The Council of Tampere Region and Karlsruhe Technology Region organize together in November 2022. The meeting was organized again by The Council of Tampere Region, and it was a face-to-face event. Like the first event, also the 2nd meeting was a half day event.

The invitees of 2nd RRI Roundtable meeting largely replicated the participants of the 1st meeting. Also, the 2nd RRI Roundtable collected six regional RRI projects with 10 participants from three institutions, namely VTT, University of Tampere and Council of Tampere Region.

One of the objectives of Tampere's pilot activity intended to raise awareness of sustainability and responsibility in regional RDI community and RRI Roundtable met this need for co-creating upcoming RRI activities in tetRRIs, and in other projects. For instance, regional RRI expertise was leveraged in designing contents to High-Level Forum workshop.

Preparation and implementation

The preparations of the second meeting started right after the first meeting in December 2021, and the 2nd meeting was planned for June 2022. Now, the initial plan was to also invite guests from Karlsruhe pilot region to the meeting who eventually participated via online.

The meeting started with project introductions which highlighted the main activities, outcomes, and results, as well as their successes and challenges. The second half of the meeting was devoted to introducing the High-Level Forum by Lukas Kurzmann from Karlsruhe pilot region, and brainstorming ideas for the upcoming workshop that started to formulate around 'citizen engagement' and 'responsible innovation'.

The meeting agenda:

9:00 Meeting starts, in Conference Centre Pellava, meeting room Roine

9:15 Working breakfast, project presentations and general RRI - discussion

10:35 Break

10:45 'Citizen engagement and responsible innovation'- workshop (Hybrid meeting starts)

11:50 The meeting ends, and we'll walk to the Restaurant Pons

12-13 Lunch

The aim of RRI roundtable is to facilitate knowledge sharing on RRI and allow room for general RRI discussion.

Figure 7. Participating projects

It was agreed in the meeting that 3rd RRI Roundtable meeting will take place in the end of the year, but as separate event from High-Level Forum meeting. In addition, it was agreed that VTT will take the responsibility of organizing the 3rd meeting to continue the initiative.

8 the High-level Forum (HFL) workshop

High-level Forum (HFL) workshop was an interactive session in a larger 3-day event of High-level Forum in Tampere November 2022. The objective of the workshop was to promote responsible innovation in general and Karlsruhe and Tampere regions in particular, as RRI actors.

The invitees of the event were innovation ecosystems who are members of HFL and participated in the event. The workshop that was organized by tetRRIs and Co-Change projects gathered nearly 30 innovation ecosystems from 5 continents. The workshop attracted some 70-80 participants representing widely the innovation ecosystem, i.e., academia, industry, policy maker and intermediaries such as funders.

The aim of HLF workshop event was to give room for HLF members, namely innovation ecosystem actors, to find connections in each other's work to build stronger bridges and future collaboration between the

partners. The session designed by Tampere and Karlsruhe promoted RRI and concentrated on arguments why stronger stakeholder engagement in needed to reach sustainability goals and get involved in responsible innovation.

The Council of Tampere Region participated in the organisation of the HLF event in Tampere since the beginning of 2022. For example, the organizing delegation from Grenoble visited Tampere 24.3.2022, and interaction with the organizing committee was intense throughout the year. The Council of Tampere Region with co-organizer of Karlsruhe Technology Region participated in the preparation meetings and negotiated an interactive session slot for tetRRIs. Tampere and Karlsruhe regions proposed sustainability and responsibility of innovation as workshop topic, which was accepted by the organizers, and it turned out that responsibility of innovation became an overarching topic of HLF 2023.

VTT got involved in preparations stronger in autumn 2022, and it assisted in designing the contents for workshop. VTT's acted as scientific support of the workshop. In September, it was decided that a sister RRI-project, Co-Change, will be an official organizer of the workshop. Around the same, the workshop topic was nailed to 'Responsibility in Innovation: How can engagement enhance responsibility?'.

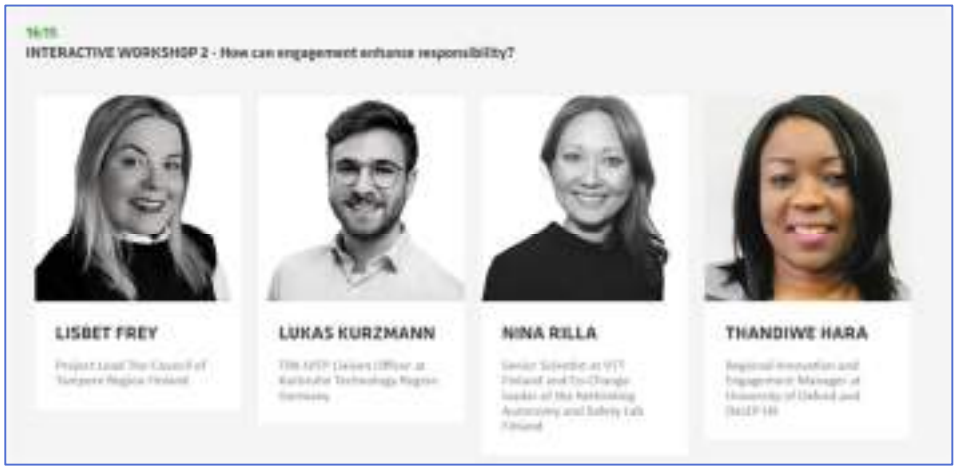


Figure 8. Presenters and facilitators of the workshop

Implementation

The session was designed as interactive session that started with short introduction to regions of Tampere, Karlsruhe, and Oxford, and continued with introduction to responsible innovation, public engagement, and sustainable development goals (SDGs).

The introduction tackled a question of why engaging wider and more diverse audiences and stakeholders to innovation ecosystem processes and activities is the key to responsible innovation? And how responsible innovation can support the SDGs?

The interactive part of workshop introduced good practices of different innovation ecosystems which the participants were able vote via an online tool called SLIDO during the workshop. The good practices were related to projects, or other activities, that drive forward the SDGs in their own ecosystems.

Figure 9. Poll for the workshop participants

The learnings of HLF event in Tampere are summarised in the blog texts:

- Global innovation ecosystem gathering – the High-Level Forum brought the international innovation community to Tampere (available at: https://tetrris.eu/global-innovation-ecosystem-gathering-the-high-level-forum-brought-the-international-innovation-community-to-tampere/)
- Regional Exchange between Karlsruhe (Karlsruhe Technology Region), Germany and Tampere (Pirkanmaa), Finland (available at: https://tetrris.eu/regional-exchange-between-karlsruhe-karlsruhe-technology-region-germany-and-tampere-pirkanmaa-finland/)

Figure 10. Workshop presentation starting

9 STRONG, STRONGER, RESPONSIBLE hybrid seminar

One major challenge in the region, which was detected in the analysis of the region´s challenges in the beginning of the TetRRIS project has been that especially SMEs do not have enough resources and competence to start their own responsibility related operations. To address this gap and discuss about major sustainability and responsibility challenges in business and technology development as well as on potential solutions, Tampere TetRRIS VTT team decided to participate in the preparation and organization of sustainability and responsibility seminar together with various teams and research areas in VTT especially for SMEs in the region but also nationwide and other relevant organizations like public organizations (e.g., city of Tampere). In the seminar it was asked and discussed, among other things, that while sustainable development has become a topic of conversation everywhere, how can we get from speech to concrete solutions? How should we deal with the inevitable issues of compromise between ecological, social, and economic sustainability? And is sustainable growth a utopia and how can technological and social innovations help build a more sustainable future?

As major target group was selected firms, various bridging organization between public policy and business, as well as public policy organizations. All these actors have an important role in the introduction, uptake or support of sustainability and responsibility in firms. The idea was also to make possible dialogue between different parties to increase their mutual understanding on challenges and potential solutions.

The major objectives in the seminar were:

- To offer information to the firms and other actors on the sustainability related challenges and solutions
- To provide an opportunity for various actors and stakeholders to discuss about the challenges and opportunities.
- To emphasize the business potential of sustainability and responsibility in changing business environment

These questions were addressed both via presentations, and panel discussions in the seminar.

In the seminar participated approximately 40 persons on-site and 120 on-line. Participants were mainly from firms but also from the city and regional development organizations. Exact numbers of the participants e.g., gender or organization are not available because the event was a hybrid one.

The action was a collaborative process among various projects and teams in VTT. Putting together a seminar required long preparation including e.g., planning, meetings and taking care of practical issues related to the event.

The seminar was held in the Glivelab, Tampere, Finland and it was fully streamed. The stream can be found from: https://www.youtube.com/watch?v=1s5hAZPEb5w (accessed on 27.3.2023)

The agenda of the seminar was as follows:

9-9.30 Opening of the event.

Jussi Manninen, Executive Vice President, VTT Technical Research Centre of Finland

9.30-10 Responsible VTT

Jussi Manninen, VTT

Lilli Kulta, Sustainability Specialist, VTT

10-10.45 Key speeches: What challenges do we face in terms of sustainability?

Tommi Pettersson, VP, Kalmar Strategy, Sustainability and Technology, Kalmar

Hanna Kalliomäki, Vice President, Sustainability, Paptic

Oras Tynkkynen, Chairman of the Board, Tyrsky-Consulting

10.45-11 Break

11-12 Perspectives on sustainability: What kind of solutions from research? Sociotechnical aspect

Mika Nieminen, Team Leader, VTT

12-12.45 Panel: Responsible result, how?

Katri Kennedy, Business Director and Sustainability Strategist, Ramboll

Niina Mikolanniemi, Sustainability manager, Vincit

Mari Zabihian, Manager (Digital services), Kemira

Jussi Manninen, VTT

Moderator: Nina Wessberg Senior Scientist, VTT Technical Research Centre of Finland

12.45-13 Closing remarks: Towards dialogue and cooperation

From the seminar was collected feed-back both quantitative and qualitative. The feed-back was almost entirely positive or neutral. Of participants 52 responded to the survey and 42% of them consider the event being of high standard. Only one respondent did not like the event at all. In the open feedback s/he commented that the event was not concrete enough. See below in detail the distribution of responses.

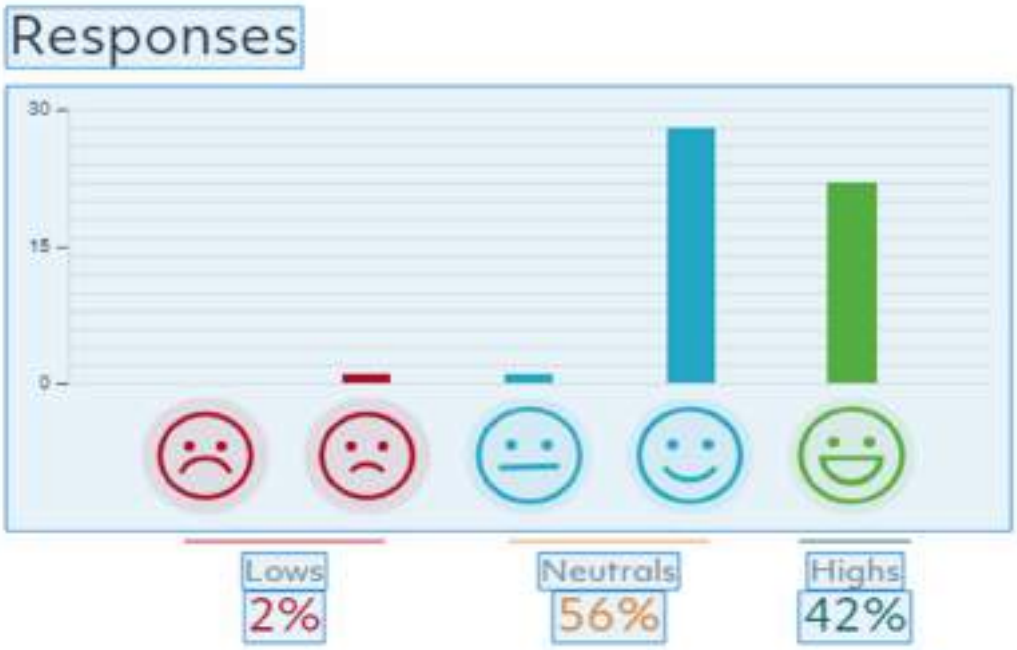


Figure 11 Feedback for the seminar

Also, the qualitative feedback was highly positive. For instance, one of the participants commented as follows:

"It was indeed an honor and a pleasure to be a part of it! And learn again from the other speeches themselves – of course, it reinforces one's own views, as others also observe similar challenges in promoting sustainability. Courage was needed in the speeches, and for me this debate yesterday also gave me a big notch of more courage and certainty about the right direction. Working together to move forward!"

Based on the feedback the event was decided to be reorganized in autumn 2023 by focal VTT actors.

10 The SPRINT Innovation Festival 2022

Sprint Innovation Festival is a challenge competition for students organised by Tampere University and the Tampere University of Applied Sciences. Tampere pilot, i.e., VTT and the Council of Tampere region, together with Business Tampere prepared a challenge for the student teams taking part in the competition. The TetRRIS challenge challenged the students to envision a sustainable digital future in the Tampere region, 10 to 20 years ahead. In the challenge, the students were encouraged to think up solutions that would have a positive impact and that might even help solve societal challenges of today and the future. Moreover, the importance of wide consideration of the different stakeholders' needs and expectations, and the positive and negative values they might experience, were stressed.

In total, nearly 500 students took part in the Sprint Innovation Festival week. During the innovation week, the students participated in specific keynote lectures, and they had several group meetings with their dedicated coach that supported them in the innovation process. Besides the TetRRIS project, companies such as Fortum and Valmet, and public sector pension provider Keva, among others, had prepared challenges to the innovation week.

The pilot action was targeted at university / university of applied sciences students. Many of the students participating had a background in the entrepreneurial studies. The pilot taking part in the event with the aim of taking sustainability and responsibility thinking to students and showing them also the importance of considering different stakeholder groups when innovating offered a great opportunity to change the thinking of the future decision-makers. In total, 34 students chose the tetRRIS challenge, and worked with it during the Sprint week.

The reason behind this challenge idea was the wide array of ethical considerations of acceptability and desirability relating to digital transition and its gadgets, services, and solutions. One of the major questions in green digital transition is how digital transformation can be implemented sustainable and responsible manner by respecting the environment and society but making the transition economically feasible.

The action contributed to the Regional development spearhead of the pilot of Tampere region, by promoting sustainability through regional development work in the region of Tampere. Firstly, the action promoted sustainability, responsibility and stakeholder engagement to students that had the chance to innovate new, future digital solutions, and secondly the action promoted the importance of wider stakeholder and sustainability considerations when innovating to the organizers of the event.

Preparation and implementation

Pre-pilot action preparations included several meetings with the event organizers to discuss the festival weeks schedule and the preparatory material that was needed. The Tampere pilot group prepared short descriptions of the challenge and delivered e.g., marketing materials for the organizers. Closer to the event, the pilot group prepared a preparatory material set with links to additional sources (a Power point set, total of 20 pages) for the students, to present the challenge, the context and the key concepts and phenomena relating to the challenge; the set included information on e.g. megatrends, sustainable development, responsibility, ethics, RRI, digitalization, smart specialization strategies in the Tampere region, national and EU level digitalization strategies, examples on the green transition in manufacturing industry and in the health sector and metaverse.

The Sprint Innovation Festival week included four meetings with the student groups that chose the TetRRIS challenge. Next, the dates and meeting goals are presented:

- Monday 7 Nov 2022: VTT team presented the challenge to the students' groups.
- Tue 8 Nov 2022: VTT team met with the students that had the possibility to ask questions on the challenge and to get first feedback on their solution idea.
- Wed 9 Nov 2022: VTT team with the student groups that had prepared short pitches of three of their best solution ideas. The ideas were discussed, and VTT gave feedback and support for the further development.
- Fri 11 Nov 2022: Each of the student groups presented their solution. A jury comprised of representatives from VTT, the Council of Tampere Region and Business Tampere, had the chance to comment the ideas and present questions. Finally, the jury came together to draw final feedback for the solutions and chose the winner of the competition.

The student groups' solutions included the following:

- Virtual reality aided interactive games for pupils with learning disabilities, supporting them with their special needs and creating a more inclusive school environment.
- Service against cyber scams for vulnerable groups, such as the elderly.

- Artificial intelligence (AI) aided health check self-service booths at healthcare stations, to ease the burden of the healthcare sector and to create better and more flexible service experiences for young people, for instance.
- Digital sustainability consultancy for starting companies and for industry-level sustainability assessment and development.
- AI-aided burn-in portable device to monitor and support well-being at work with advanced prognosis feature.
- Waste collection robot in a smart city environment, with new energy solutions, automation and optimization features and advanced on-site waste processing and recycling.

The winning solution was the idea of an AI-aided health check self-service booth. A special mention was given to the waste collection robot idea.

The challenge proposed by the TetRRIS project was challenging for the students for four reasons. Firstly, it urged the students to look into future, with the time span of 10 to 20 years ahead, which asks for deep understanding on the phenomena and trends taking place and the direction of technological development, for example. Secondly, the challenge urged the students to consider the stakeholders of the solutions widely, and the values they might experience. This was an extension to the original guidance that the Sprint organizers encouraged the students to consider, as the Sprint itself guided the students to focus especially on the customer of the solutions. Thirdly, many of the digital concepts that the challenge brought forward and highlighted in terms of future development paths, such as metaverse and AI, are very complex and to somewhat still emerging concepts, that were perhaps challenging to approach by the students that came from different backgrounds and stages of their studies. Fourthly, questions on responsibility and sustainability and ethical issues are often very complex and difficult.

After the innovation week, the VTT team met once with the organizer to discuss the experiences, receive feedback from the students and to give feedback on the event and its practicalities. According to the student feedback, approximately 67 % of the students that gave feedback found the challenge very interesting or somewhat interesting.

The feedback that the VTT team gave to the organizers was to perhaps include elements of foresight and future perspectives, and a broader stakeholder engagement, in the challenge guidance given to students in the future Innovation Festival Sprints.

11 RRI Roundtable meeting 2022, volume 2

The RRI roundtable was designed to be a meeting series, and the third meeting was organized to meet the needs identified in the region – i.e., to improve knowledge exchange of RRI. The 3rd meeting centralized on a topic of the prospects of RRI, given that many H2020 funded RRI themed projects are reaching to the end in 2022. The meeting was organized by VTT and tetRRIS's sister RRI project, called Co-Change which focuses on co-creating RRI-related change on research funding and performing organisations. The event was a hybrid meeting in Tampere and online, and it lasted 2.5 hours.

Given that the two previous meetings were organized as face-to-face events and attracted mainly regional participants, we wanted the third meeting to be integrate also European perspectives. colleagues. Thus, the invitation was sent to RRI sister projects, and European partners of tetRRIS. The 3rd RRI Roundtable meeting had 12 participants, 8 from research organisations and 4 from RDI intermediaries. In total 4

participants connected outside Finland. This event had unfortunately relatively large no-show number, as 8 persons had to cancel their participation.

One of the objectives of Tampere's pilot activity intended to raise awareness of sustainability and responsibility in regional RDI community and RRI Roundtable met this need for co-creating upcoming RRI activities in tetRRIs, and in other projects. The 3rd RRI meeting managed to extend beyond regional and national boarders which also served the internationalisation goals of Tampere pilot.

The preparations of the third RRI Roundtable meeting started in August 2022 to explore potential date with key organizers. It was soon realized that Tampere Pilot is involved in several events in autumn that postponed the meeting in the beginning of December. Discussions with Co-Change project partners were also initiated to find a suitable date the RRI event.

Implementation

The 3rd RRI Roundtable meeting took a future-oriented outlook. The aim was to discuss the prospects of RRI - what direction are we heading? How is the use of the concept of RRI evolving and what are some of the main challenges for the future? What should we do to keep help realizing the goals of RRI? This discussion started with keynote interviews of three RRI experts: Mika Nieminen, VTT; Julie Jouvencel, SoScience (France) and Nina Wessberg, VTT.

Figure 12 Agenda of the RRI Roundtable meeting

The interviews explored what was interviewees first encounter with RRI concept, and how have they in practice addressed RRI in their project, and what is their view to RRI's future as key concept of responsible innovation.

After the interviews, the participants were divided into three smaller groups to discuss about the future of RRI. The discussions were facilitated in groups with the help of Miro online tool. Groups explored questions such as what direction are we heading? How is the use of the concept of RRI evolving? What are the main challenges for the future? What should we do to help realizing the goals of RRI?

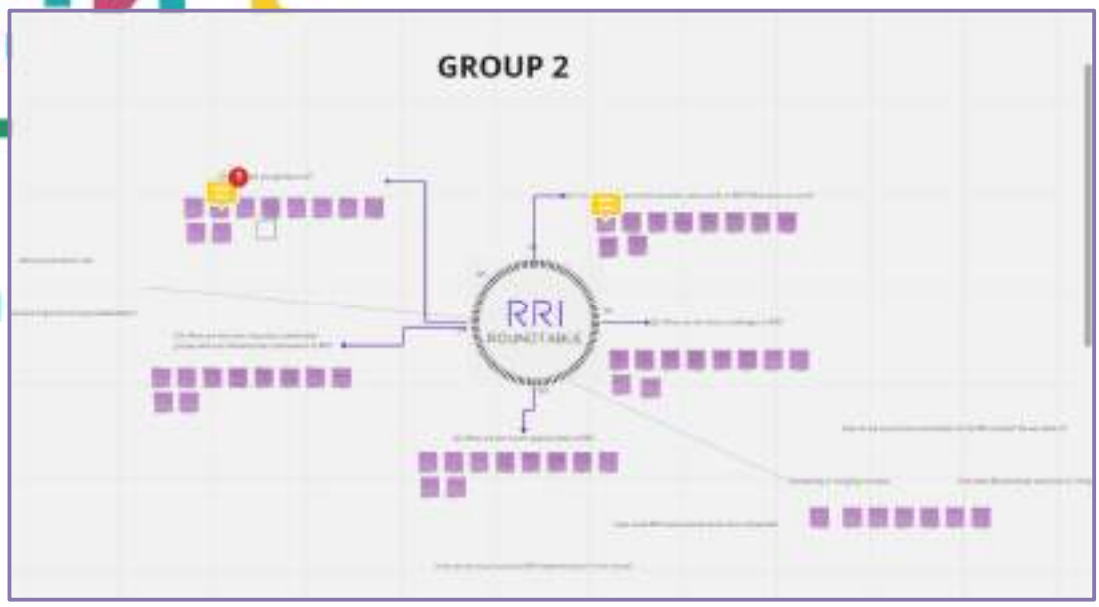


Figure 13. An example of the Miro canvas in the meeting

A blog text that summarized the discussions of 3rd RRI roundtable meeting was published on Co-Change web site, https://cochangeproject.eu/article/embedded-necessary-meaningful-are-these-ingredients-sufficient-for-a-sustainable-rri-future. Also, tetRRIS website has a link to the blog text.

The 4th RRI Roundtable timing was not set in the meeting, but it was later suggested that the Council of Tampere Region will organize next event in May 2023 in which VTT will assist as a scientific partner of Tampere pilot. Hence, the organisation of 4th RRI Roundtable meeting is a pending activity in 2023.

12 The regional exchange with Tampere and Szeged-Timisoara, Hungary-Romania

The specific activities for a regional exchange between Tampere and Szeged-Timisoara were set in a consortium meeting in Brussels in October 2022. In was realized that VTT and YAGHMA could help to run a foresight workshop with local stakeholders of Szeged to identify common interests in responsible and sustainable innovation that translates into roadmap actions towards sustainable research and innovation in Szeged. The workshop was organized on 8th of December 2022. Given that Szeged-Timisoara region is a learning partner of tetRRIS, one of the objectives of the visit in Szeged was to reflect the learnings of Tampere.

DarInno was responsible in engaging local innovation ecosystem stakeholders, and the participants of the event represented University of Szeged, Demola Szeged, Laser and ICT clusters. The workshop on 8th December hosted 14 persons in the morning session and 6 persons in the afternoon session. The morning session was organized in University of Szeged and the afternoon session in Science Park Szeged, ELI-ALPS.

Breakfast meeting on Friday 9th December hosted 2 persons, and visit to Kecskemét, Kecskemét University to get to know Hungarian DIH² Network (dih-squared.eu) hosted 6 persons from the university.

The aim of visit to Szeged was exchange of knowledge, regional learnings, and good practices between the tetRRIS pilot regions of Tampere and Szeged-Timisoara. In addition to running a foresight workshop in Szeged, the visit provided an opportunity to start discussion of replicating Responsibility accelerator

for SMEs to Szeged. The accelerator was piloted in Tampere in spring 2022, and Szeged region had indicated interest to pilot similar activity.

Preparation and implementation

The preparations of pilot action were initiated in tetRRIs' Consortium meeting in Brussels, October 2022. In the meeting, it was decided that Szeged-Timisoara could benefit of visioning workshop that aims to build an action roadmap to responsible and sustainable R&I in 2030. Timing of the workshop was agreed in the meeting, given that it was preferred to organize the visit before end of 2022. Setting of the agenda for the visit and contents of the workshop continued between October and early December in various online meetings. VTT and TU Delft team was responsible in designing contents of the workshop, while DarInno concentrated on engaging local stakeholders.

The workshop day started with introduction to sustainable and responsible innovation, and introduction to regional R&I characteristics. After the presentation, we moved to short workshop part to create a shared vision for responsible and sustainable R&I strategies in 2030 in Szeged.

PART I: Foresight for sustainable research and innovation in Szeged

Time: 9:30-12:30

Place: University of Szeged, Rector's Office – 229. Terem

9:30- Welcome – Mátyás Dénes, department of strategic management University of Szeged

9:45-10:15 (30') Inspirational talk: How to embed RRI into regional R&I processes? Mika Nieminen, VTT and Emad Yaghmaei, TU Delft

- Bring examples from Finland – why it is important to take RRI and sustainability seriously. in research, businesses and regional governance
- Present European agenda for sustainability and responsibility
- Immediate Q&A

10:15-10:45 (30') Talk about local conditions in Szeged

- Introduction of science park activities - Plavecz Péter
- university view on RRI – Mátyás Dénes + Prof.Bajmóczy Zoltán
- introduction of the TIP (Territorial Innovation Platform) – Mátyás Dénes

10:45- 11:30 Discussion & Break

11:30 - 12:15 (45') Workshop (in small groups)

- Exercise 1: Building a common vision for embedding RRI in local R&I system (30')
- Discussion of the group work (15')

12:15-12:30 Closing of the event

Agenda of the afternoon meeting concentrated more strongly on the foresight exercises, which were performed in one group instead of multiple groups given the number of participants was feasible for a common discussion.

PART II: Building action roadmaps for sustainable research and innovation in Szeged.

Time: 14:00-16:30
Place: Science Park Szeged, ELI-ALPS (https://www.eli-alps.hu/) – Gyarmati Zoltán.

14:00- 14:30 (30') Welcome and introduction to workshop

14.30 - 15.00 Future developments and projects in Science Park Szeged

- Dr. Csaba Janáky – SunFlower project –
- Enikő Koppány – Demola Szeged –

15:00-16:00 (60') Workshop (in small groups)

-Exercise 1: Introducing and revising the vision(s) created in the morning (15')

-Exercise 2: Identifying local stakeholders who should be engaged in successful RRI embedding (30')

-Exercise 3: Identifying actions how to reach the vision (45')

16:00- 16:20 (20') Discussion of the group work

16:20-16:30 (10') Closing of the workshop.

The first exercise was to revise the vision(s) created in the morning that was followed by identifying key local stakeholders and identifying gaps and needs in R&D&I who should be engaged in successful RRI embedding. The last exercise to identify actions to reach the vision was excluded because of time constraints, although during the common discussion we addressed regional action points to start a firmer journey towards responsible innovation in the region.

Figure 14. Workshop exercise

The collaboration with Tampere and Szeged-Timisoara regions continued in the form of co-creating a concept note for sustainability Accelerator in Szeged. The teams have been in frequent contact since the visit to Szeged, and the knowledge exchange continues in the form of designing the accelerator. Also, Demola Szeged joined the initiative, given that it has contacts to local star-up community. The concept note will be finalised in March-April 2023, which would still give room to pilot the accelerator during the tetRRIS project. Hence, creating a Concept Note to Responsibility Accelerator is an activity that will still take place in spring 2023.

13 European cooperation and the exchange between Tampere and Karlsruhe technology regions

During the early months of the TetRRIS project, it became apparent that the pilot regions of Karlsruhe (Germany) and Tampere (Finland) had many similarities. Various representatives from the regions gathered for online exchanges in autumn 2021 to examine more closely these parallels. These meetings fulfilled several functions. For starters, they were meant to individually introduce members of organizations that were not part of the core TetRRIS project teams but should still be engaged in the regional exchange. Second, they aimed to better familiarize members of the two organizations with each other's structures, political and policy processes, as well as the organizations' mission and objectives. Third, they helped to discover similar issues and areas of interest on which to base future collaboration and exchange.

The action brought together participants from regional organizations and project actors of both regions: From Tampere: VTT, the Council of Tampere Region, Business Tampere, Tampere University, Tampere City Region, and the SIX Initiative; and from Karlsruhe: Technologie Region Karlsruhe, Fraunhofer ISI, and FZI Research Center for Information Technology. Many of the actors were already familiar with and involved in the TetRRIS project activities, but the action motivated and engaged also new actors that were interested in developing their international, cross-regional collaboration, and in finding new benchmarks with which to learn and co-create together in the future.

Karlsruhe and Tampere, despite having different institutional structures, have agreed to collaborate on a pilot project to create a network that will improve transparency and promote collaboration between those European regions. This action aims to share knowledge, ideas, and experiences to bring about institutional change within regional development organizations and establish base for future collaboration. The action answered to the target of the regional development spearhead of the pilot.

Preparation and implementation

In early 2022, a series of brainstorming workshops were conducted with different partners to identify potential areas of collaboration. As the TetRRIS project progressed, it was discovered that there were already established connections between the regions. These existing connections were discussed with stakeholders and integrated into future planning. The themes of participation and responsibility under Responsible Research and Innovation (RRI) were particularly emphasized and explored in their various aspects and dimensions.

Collaboration on a workshop organized in the High-Level forum was one of the key outputs of the action. In June 2022, the TechnologieRegion Karlsruhe GmbH (TRK), Council of Tampere Region,

Technical Research Centre of Finland (VTT), and University of Oxford / OxLEP from the HLF community began planning a workshop for the High Level Forum, which took place at 7.11.2022 (detailed description in the chapter “Tampere: High-level Forum (HFL) workshop”).

Representatives from Karlsruhe and Tampere participated in a policy lab in Brussels in mid-October 2022 while the preparations for the HLF event were underway. The policy lab served as a source of inspiration for the regions as they learned about various ecosystems introduced during the European Week of Regions & Cities, which focused on facilitating regional exchange between different institutions in the regions.

Another meeting took place during HLF, on 9 November 2022, after the co-designed workshop "How can engagement enhance responsibility?". The delegations from Karlsruhe and Tampere met for an in-person exchange to identify common interest and make plans to continue collaboration. The meeting involved many regional organizations and projects: VTT, the Council of Tampere Region, Business Tampere, Tampere University, Tampere City Region, and the SIX Initiative; and Technologie Region Karlsruhe, Fraunhofer ISI, and FZI Research Center for Information Technology; and nine experts in total.

Following activities conducted in 2022, the collaborative effort between Karlsruhe Technology Region and the Council of Tampere Region yielded notable achievements. The two regions generated innovative approaches to address challenges such as the scarcity of qualified personnel, the transition towards sustainable mobility and energy systems, and the development of neighborhoods. The outcomes of this cooperation will be incorporated into the respective regional development strategies.

Moving forward into 2023, both regions aim to establish a sustainable foundation for ongoing dialogue and knowledge exchange beyond the scope of the TetRRIS project. After the collaboration in TetRRIS, collaboration between the two regions will be taken forward especially by Business Tampere and Karlsruhe Technologie Region. The potential themes for collaboration include e.g., matchmaking companies, scouting for corporate innovation, benchmarking, joint EU projects, and event collaboration in exploring new technologies and processes. In terms of responsibility, especially stakeholder engagement and inclusion were identified as important topics for further discussions.

14 Building a roadmap of the regional digital compass in the Council of Tampere Region

In the spring of 2021, the EU Commission published a policy proposal on the EU's digital decade and digital compass, which sets the EU strategic and measurable goals related to digitalization. Finland has prepared a national digital compass for the year 2022. During the spring of 2022, Pirkanmaa (the Tampere region) have been the first EU province to work on a regional digital compass. With it, it is intended to increase and target investments and development measures based on Pirkanmaa's strengths as part of the implementation of European and national goals. The preparation of Pirkanmaa's digital compass is divided into two phases. In the first phase, the regional strategic goals have been defined based on the EU digital compass and the necessary and available metrics have been identified. The goals have been prepared for the four areas of digicompass: digital competence, digitalization of business, digital infrastructure and digital public

services. In the second stage, the measures needed to implement the goals will be identified and a road map consisting of the measures will be created.

To ensure that the strategic goals included in the digital compass reflect a comprehensive and multidimensional understanding of the digital revolution, it was deemed essential to engage in extensive and informed discussions. To this end, a broad range of experts from Pirkanmaa's stakeholders were invited to participate in the development of the compass. The participants were divided into four working groups based on the cardinal points of the compass, each consisting of a chairperson and 7-9 expert members, including representatives of public and private sector organizations, and academics. These groups were supported by a network of information management experts from participating organizations, as well as a secretariat composed of experts from the Pirkanmaa association. Around 80 people participated in an open stakeholder meeting held on May 23, 2022.

The objectives of the building a roadmap of the regional digital compass in the Tampere Region are mainly to increase investments in digitalization in the region and improve the synergies of digital (and green) policies and investments, sharpen the profile of Tampere Region related to the European and national digital targets, policy instruments and funding programmes, attract businesses, partners, digital talent and investments, increase regional contribution to the European digital policies and contribute to the national digital compass. The use of participatory, open and interactive methods plays an important role in the process of preparing the Digital compass. The project has applied the so-called RIS4 thinking, and efforts have been made to integrate the approaches of responsible RRI policy into regional development. The concrete goal has been to increase the inclusivity of the process and thereby promote systemic thinking and the societal effectiveness and acceptability of the road map.

Implementation

During the stakeholder meeting at 15.10.2021, the key stakeholders of the region have discussed the digital decade with a conclusion that it is necessary to create Pirkanmaa regional digital compass, the compass should be created in an open and participatory process coordinated by the Council of Tampere Region, a multi-stakeholder steering group needs to be created for the compass and that the next digital development program of the City of Tampere will be created within the framework of the digital compass.

At the initiative of the Council of Tampere Region, a regional digital compass that will last until 2030 is being defined for the region. The project is implemented in a wide regional cooperation network and has been directed by a steering group confirmed by the provincial government. The EU Commission's Joint Research Center (JRC) has supported the implementation of Pirkanmaa's digital compass as part of the Science Meets Regions (SMR) program.

The activities included a series of facilitated workshops with key regional stakeholders and national and European experts and policy makers. Dedicated small-scale studies were carried out during the co-creation process to strengthen the required evidence base.

The process of developing the digital compass in Pirkanmaa was conducted as a learning process, progressing through stages that utilized the diverse and deep knowledge of participants through sharing, coordinating, and refining it. The principle behind this process was the continuous iteration

of information to avoid making decisions too early and based on preconceived notions, thus ensuring that choices were made based on detailed and shared interpretation and learning.

In addition to Pirkanmaa's own digital compass work, the Finnish national compass process was also monitored and participated in at various stages through events, workshops, and preparing a statement on the draft national compass. It was crucial to influence the formation of the Finnish digital compass and evaluate its relationship with Pirkanmaa, as this kind of strategy work formed a good basis for forming strategic choices and strengthening cooperation between regions.

The connection of the compass to the overall strategic development of the region was an essential starting point in its preparation. The Council of Tampere Region's provincial program and smart specialization strategy acknowledged the strengths of know-how, research, specialized and internationally competitive business operations, and how they could help the province renew itself in the face of various changes in the operating environment.

The process of creating Pirkanmaa's digital compass began with a kick-off event where experts were introduced to the four points of the EU's digital compass, along with their goals and background analysis. Thematic follow-ups work then took place, where preliminary SWOT analyses were produced. This helped to examine the strengths, weaknesses, opportunities, and threats of the Pirkanmaa province in relation to the goals set by the EU, as well as the strengths of other regions in Finland and the EU.

The secretariat then compiled thematic preparation material based on the SWOT discussion, which supported the definition of goals in the working groups. This preparation material relied on the "Path to the Digital Decade 2030" background material from the EU Commission. The material was reviewed with the chairman of each branch, and necessary clarifications were made for the SWOT analysis.

Next, the first workshops began, where the working groups evaluated the preliminary SWOT analysis results further and refined and balanced the analysis. It was considered important that strategic thinking related to the digital revolution progressed through a multidimensional information-based discussion, and experts from Pirkanmaa's stakeholders were widely invited to the digital compass work. Four working groups were assembled according to the points of the compass, and each group consisted of a chairman and 7-9 expert members. The theme groups were supported by a data and metric network made up of information management experts from participating organizations and a secretariat made up of experts from the Pirkanmaa association.

During the first workshops of Pirkanmaa's digital compass creation process, experts discussed the development opportunities arising from the preliminary SWOT analysis. Working groups identified development themes and sub-goals for each compass focus point. The responses were then analyzed and three to four goal themes for each working group were formed, which were used to group the identified development goals into sub-goals.

The second round of workshops began after defining and reporting the target themes and preliminary goals. During these workshops, working groups refined the target themes and identified the possibilities of monitoring related targets with the data available. At the start of the compass process, it was evident that obtaining the data required for measurement would be challenging since new data was not being collected at this stage, but existing data sources were being utilized. During the workshops, the working groups identified their information needs by exploring data sources and

their capacity to provide information at the provincial level. With the assistance of data experts, the various data sources and their available data were examined in greater detail, and data availability was considered as a criterion for prioritizing goals.

In the third round of workshops, the working groups examined the most promising indicators for strategic goals based on the detailed sub-goals, data sources, and metrics identified by the data and metrics working group. During this stage, the sub-goals were further specified, and through prioritization discussions, 5-6 sub-goals were selected, covering the most significant themes that offer a credible opportunity to produce valid and reliable measurement data to monitor the realization of the goals.

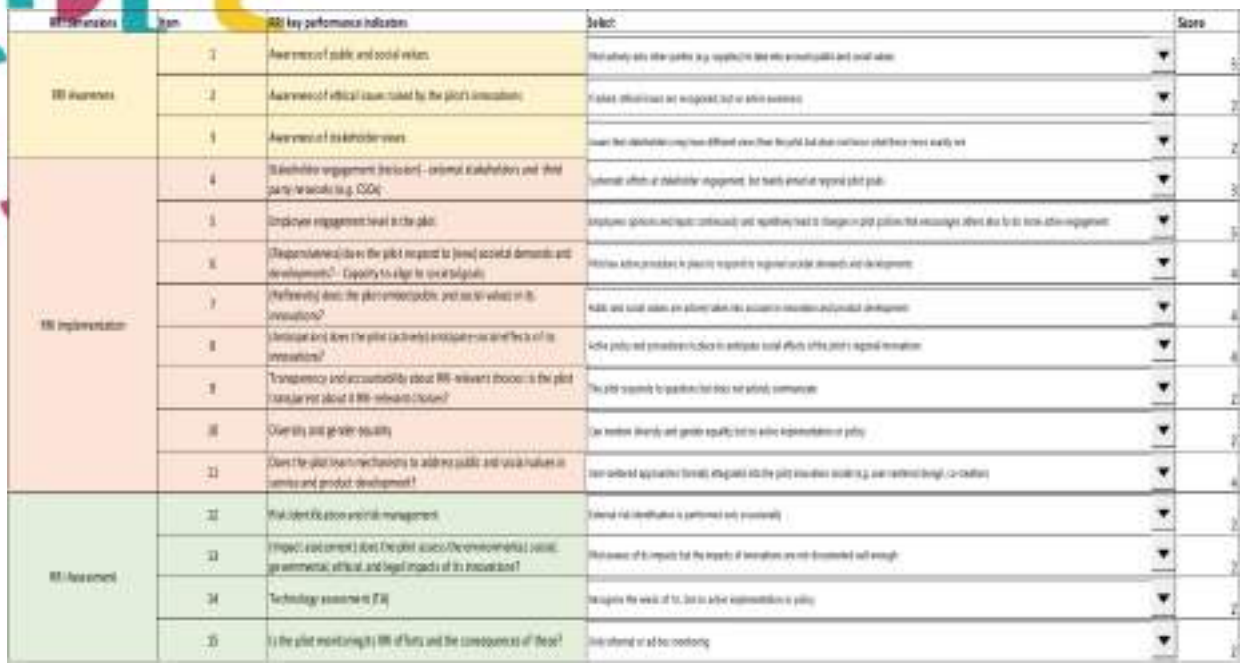
The final step of the process was an open stakeholder meeting held on May 23, 2022, where the results of the process were presented, from SWOT analysis to goals, sub-goals, and metrics. Approximately 80 people participated in the discussion event, which was preceded by an engagement and communication campaign carried out on social media to arouse public discussion and validate the presented goals. The event was also made available remotely, and participants could contribute to the discussion via social media channels, especially Twitter. Two weeks after the event, a Webropol survey was sent to stakeholders who participated in the event, asking for their feedback on Pirkanmaa's digital compass.

The first phase of Pirkanmaa's digital compass process (1–6/2020) was launched during the acute phase of the coronavirus pandemic, when remote work was strongly recommended. To adapt to the situation, Teams and Howspace tools were utilized, which proved to be effective choices given the digital nature of the project. However, the expert resources of the working groups had to be adjusted due to occasional illnesses.

The next step of the process is to prepare a regional digitalization road map. The measures of the road map will allow to implement the strategic digitization goals set in Pirkanmaa's digital compass by 2030. The work on the road map is planned to be done from 1 February to 30 June 2023. The activity has the potential to make the regional strategies more engaging, accessible, and transparent to civil society and the wider regional innovation ecosystem from an RRI perspective. The activity has been designed to create institutional change and promote responsible digital transition within the region and stakeholder organizations.

2. Reflection survey

To evaluate the added value of RRI within TetRRIs project, a reflection survey with 15 questions around RRI implementation at current stage for each region was developed in order to be reflected at the middle of pilot actions (work package 4) and at the end of the project (work package 6). For Tampere it was filled in by pilot partners (Council of Tampere region) and scientific partners (VTT) and the first-round results are presented below. The highest scores were given on dimensions related to RRI awareness and RRI implementation, whereas the lowest on RRI assessment methods.



RRI dimensions	Item	RRI key performance indicators	Select	Score
RRI Awareness	1	Awareness of public and social values		
	2	Awareness of ethical issues raised by the pilot's innovations		
	3	Awareness of stakeholder views		
RRI Implementation	4	Stakeholder engagement (inclusion) - external stakeholders and third party networks (e.g. CSOs)		
	5	Employee engagement level in the pilot		
	6	(Responsiveness) does the pilot respond to (new) societal demands and developments? - Capacity to align to societal goals		
	7	(Reflexivity) does the pilot embed public and social values in its innovations?		
	8	(Anticipation) does the pilot (actively) anticipate social effects of its innovations?		
	9	Transparency and accountability about RRI-relevant choices: is the pilot transparent about it RRI-relevant choices?		
	10	Diversity and gender equality		
	11	Does the pilot have mechanisms to address public and social values in service and product development?		
RRI Assessment	12	Risk identification and risk management		
	13	(Impact assessment) does the pilot assess the environmental, social, governmental, ethical, and legal impacts of its innovations?		
	14	Technology assessment (TA)		
	15	Is the pilot monitoring its RRI efforts and the consequences of these?		

Figure 15 Reflection Survey Council of Tampere region

RRI dimensions	Item	RRI key performance indicators	Select	Score
RRI Awareness	1	Awareness of public and social values		5
	2	Awareness of ethical issues raised by the pilot's innovations		5
	3	Awareness of stakeholder views		4
RRI Implementation	4	Stakeholder engagement (inclusion) - external stakeholders and third party networks (e.g. CSOs)		4
	5	Employee engagement level in the pilot		4
	6	(Responsiveness) does the pilot respond to (new) societal demands and developments? - Capacity to align to societal goals		5
	7	(Reflexivity) does the pilot embed public and social values in its innovations?		4
	8	(Anticipation) does the pilot (actively) anticipate social effects of its innovations?		5
	9	Transparency and accountability about RRI-relevant choices: is the pilot transparent about it RRI-relevant choices?		3
	10	Diversity and gender equality		4
	11	Does the pilot have mechanisms to address public and social values in service and product development?		4
RRI Assessment	12	Risk identification and risk management		3
	13	(Impact assessment) does the pilot assess the environmental, social, governmental, ethical, and legal impacts of its innovations?		3
	14	Technology assessment (TA)		1
	15	Is the pilot monitoring its RRI efforts and the consequences of these?		3

Figure 16 Reflection Survey VTT

In the preparation phase of the project, VTT and the Council of Tampere Region saw it important that the pilot contributes to the development of the innovation system, which while supporting the renewal of the traditionally strong manufacturing industry, would also be attentive to ecological, ethical and social considerations in such a way that they are systematically integrated into innovation activities in the region.

In terms of RRI, six themes were identified particularly important to the Tampere region: anticipation, openness, diversity (incl. gender questions), stakeholder inclusion and public engagement, transparency, and communication of RDI activities, and reflexivity and responsiveness. Responsibility and sustainable development related perspectives are getting increasingly important in policies and businesses also in the Tampere region.

However, now, as the project reaches its end, it can be noted that the RRI as a concept is not strongly present in the regional level, while many of its elements have become widely acknowledged and integrated in both policies and business. This was, in practice, the situation also in the beginning of the project: de facto RRI was already present, and a "tactical" choice was made to further support these dimensions and strengthen the uptake of new ones where possible. RRI was considered too academic and alien concept for the practitioners and therefore it was "translated" into concrete actions and dimensions more familiar to the practitioners to ease the stronger adoption of responsibility and sustainability thinking. In this sense, the project group participated and launched various initiatives like engaged in the regional strategy process and SPRINT Innovation Festival, and launched Responsibility Accelerator for regional SMEs.

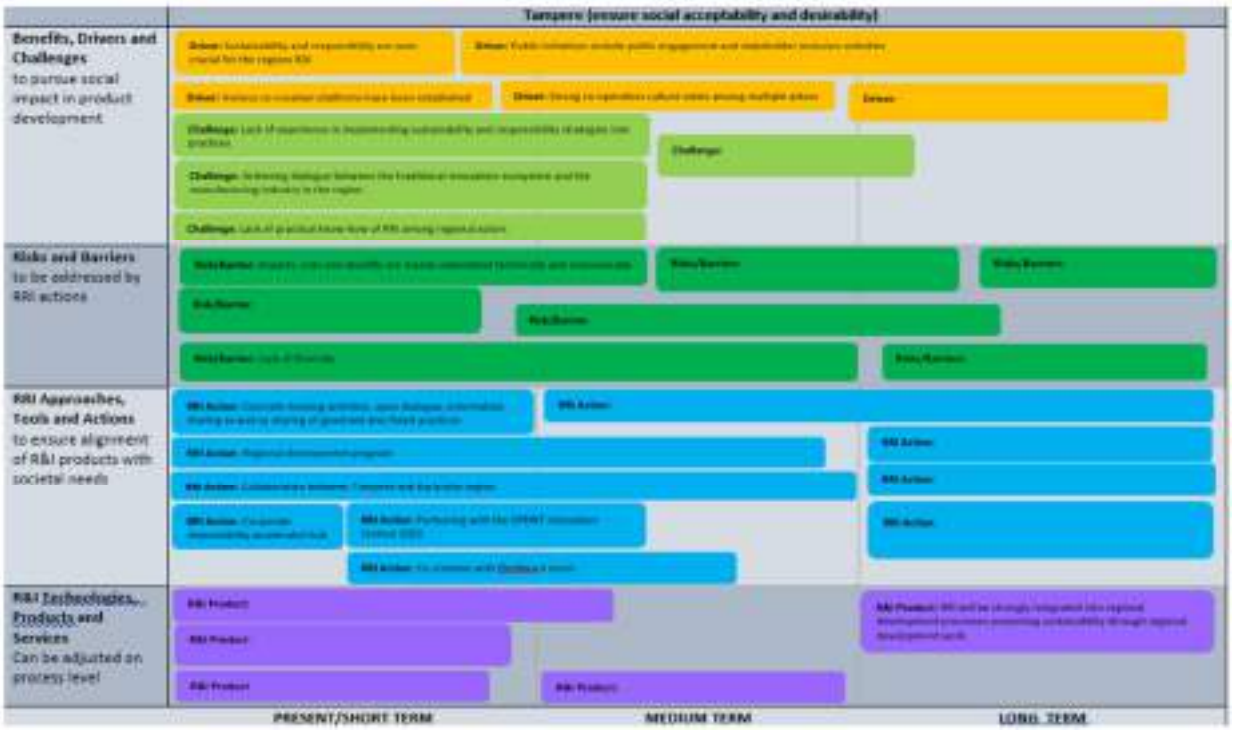


Figure 17. Roadmap elements of the Tampere region pilot as identified in the beginning of the project.

It is noteworthy that the concepts are constantly developing and reshaping. For instance, during the project period, the gender equality target has been increasingly included into wider concepts and related discussions on diversity, inclusiveness, and equality. Another very descriptive example is the growing importance of social perspective in firms´ operations besides environmental ones. This change is due to e.g., changing customer needs and new regulation such as Corporate Sustainability Reporting Directive and Corporate Sustainability Due Diligence Directive. Alongside of new regulation, stakeholder engagement and inclusion are becoming more and more relevant in companies.

As sustainability and responsibility are complex, wide and constantly evolving concepts, there is a need to keep the discussion and dialogue going on what they mean for different organisations, in different contexts, and how to take them forward into practices and decision-making so that the whole (innovation)system becomes more sustainable.

Thus, one of the challenges in the region was and still is the lack of practical know-how and experience in implementing sustainability and responsibility strategies; in companies this means, for example, how to implement the sustainability strategy and integrate it into product development processes and product design phase, or how to network with others with similar challenges, and share resources and expertise without risking one's key business idea. Also, from a company perspective, it is a challenge to find the right people with whom to discuss on sustainability related issues. A more general challenge is stakeholder engagement: How to do it in right way, and to reach a representative sample of various stakeholder groups, and how to carry out stakeholder engagement activities in such a way that it supports the aim of creating better understanding of the values and needs of the stakeholders but being also efficient and effective in terms of resource use.

One of the strengths of the Tampere region has been strong co-operation culture, and the various co-creation platforms among educational institutions and individual companies. Thus, especially in the beginning of the project, the project team closely collaborated with regional industrial networks, Smart Manufacturing Hub project and the national SIX Smart Manufacturing initiative. However, with established industrial networks the building of continuous, deep collaboration, and co-creation is a challenge as it requires trust, common language as well as shared understanding and vision of the future. Existing networks may already have established processes, roles and ways of operating in place, and introducing new ideas and creating new connections with these networks is not an easy task but takes a lot of time and effort. Among other things, due to these challenges we were not able to continue the discussions with SMH and SIX as actively till the last months of the project as they were in the beginning.

Based on the regional analysis and roadmap work, in the beginning of TetRRIS project the Tampere pilot was divided into two spearheads, other focusing more on the regional development processes and other on the manufacturing industry's ecosystem and processes (see Figure 1). The general view of the project has held its grip. As planned in the beginning of the project, the regional development spearhead was implemented through successful participation in the regional development program. In addition, related actions have been the initiative for policy and development collaboration between Tampere and Karlsruhe regions, as well as regional co-creation activities of various stakeholders in the Ekothon2, aiming at the implementation of sustainability thinking in region more broadly.

Likewise, the actions planned for the Industrial RDI networks spearhead took place mostly as planned. The project team designed and piloted the Corporate Responsibility Accelerator Hub for industry and partnered with the SPRINT Innovation Festival in 2021 and 2022 to highlight the significance of responsibility and sustainability of innovations among local university and university of applied sciences students. Besides these actions, the regional development spearhead extended to develop regional collaboration between Tampere and Szeged-Timisoara, as well as brought together various RRI-focused research projects from the region and beyond in the RRI Roundtable event, which was organized four times during the project. In addition, the sustainability seminar organized in autumn 2022 should be mentioned. Even though the sustainability seminar was targeted especially to SMEs, it reached other organizations too, and served as an integrating event supporting both pilot spearheads.

As a general reflection of the roadmap, it can be said that the challenges and opportunities in place in the beginning of the project are still relevant, while concurrently considerable progress in the sustainability and responsibility thinking in the region has taken place both due to the change of operational environment and initiatives of the project.

III. Cantabria region

1.Exploration stage

Cantabria´s pilot plan has focused on four domains of opportunity identified for the diffusion and adoption of RRI concept in the territory. These four domains were selected in D3.1 and have been refined in D3.2 and finally titled as:

1. **Bioeconomies, Health and post-Covid-19 Society**
2. **Blue Economy and Fair Energy Transitions**
3. **Responsible Industry 4.0**
4. **Territorial Sustainability and Responsibility**

The actions developed during the piloting phase were spurred thanks to the Social Lab approach, that helped to meet the major stakeholders of the regional innovation system. This social lab methodology initiated with the mapping developed in WP2 but continued with two participatory workshops at Santander and Torrelavega that engaged different stakeholders. Co-creation processes have been facilitated into different workshops as well as different interactions and activities that have been demanded by participants such as trainings, dedicated events, follow-up meetings, and others. These activities required participation of different stakeholders identified during the empirical fieldwork carried out in deliverable 2.2 as well as others that have been also identified.

These co-creation processes started with an **exploration stage** that was aimed to promote engagement with selected stakeholders that have been initially identified. The main objective of the first workshop WS1 (29th of October 2021 in Santander) was to set up the TetRRIS Lab in Cantabria and to trigger the process deployed till the beginning of 2023.**A second stage** helped to work on the **definition and initiation of pilot actions** along the lines of regionally specific challenges in the identified domains. Based on the results of the first workshop, the implementation and execution of pilot actions were kicked off through a roadmap-focus process managed in WP4.

WS1 was designed and conceptualized to meet the challenges previously explored in the diagnosis of the innovation ecosystem (D2.2, D3.1 and D3.2). These challenges were mainly associated with the lack of innovation culture, lack of open innovation strategy, lack of cooperation between R&I agents and others related. In this session, participants were encouraged to propose ideas understanding of each other's perspectives, expectations, priorities and concerns to strengthening science-society interactions in their particular contexts and aligning them to socio-ethical aspects of innovation policy.

TECNALIA worked closely with SODERCAN to recruit participants for the first workshop that had taking part in the interviews but also to invite other stakeholders identified during the fall of 2021. WS1 was initially planned to have around a set of 20-25 participants from different sectors and domains of the R&I regional ecosystem of Cantabria, but the recruitment process worked well and around 40-45 participants finally confirmed their participation at the event. This good news created a sort of tension into the team for *"meeting the rising interest and expectations of participants*".

Additionally, the dynamics at place were designed for 20-25 participants and this created some problems that were managed during the event.

The main objectives of WS1 of the TetRRIS Lab in Cantabria were mainly related with the setting up of the lab, as well as involving a significant number of stakeholders in the R&I ecosystem of Cantabria. These objectives were considered critical for triggering collaborative pilot actions between stakeholders. In this regard, the design and contents of the event were oriented to promote these collaboratively pilot actions for promoting and facilitating collaborative work around RRI feeding into regional RIS3 policy.The number of participants engaged in the event, as well as their interest and energy demonstrated during this first workshop proved to be a valid test for the validation of these objectives. It is also important to acknowledge the active involvement of political powers in the event as General Directorate for Innovation and General Directorate of Industry of Cantabria Government both attended the event.

From the initial list of 60 stakeholders invited to participate, 42 were registered, only 2 persons that were registered did not attend and 1 person that was not registered participated in the WS.
Regarding the type of stakeholder: 13 participants from Academia/Research, 17 from Innovation/Business and 12 from Public Administration/Policy Maker. 11 participants were already involved in the D1.2 Mapping exercise interviews and half of the attendants also participated in the virtual workshop (6th May 2021) in which the prior fieldwork results were presented and validated (D3.1)

Table 6 List of participants in WS1

PARTICIPANTS	SSTAKEHOLDER[1]	REGION	GENDER
44	Academia/Researsch	Cantabria	12 Females/32 Males

Preparation and implementation

For the preparation of WS1, that took place in the 29th of October of 2021 at Santander, several actions and tasks were conducted to the design, conceptualization and setting up of the event. The development of the agenda was oriented to present the new RIS3 regional strategy with the collaboration of DG of Innovation of Cantabria Government (Jorge Muyo) who attracted many stakeholders. There was also the presentation of the four domains of opportunity for RRI by TECNALIA team and another short-invited talk of EDP about energy transitions. After these talks, participatory activities were activated to develop co-creation activities between stakeholders.

[1] Please select: Academia/research, innovation/business, Public administration/policy maker, CSO/lay person/association, Other.

Figure 18 Agenda of WS1 (in Spanish)

After these presentations, the first exercise was designed to break the ice between participants and to meet each other. In groups of 4-5 people, participants were encouraged to present themselves to the group and trying to explain what it means responsibility for them and in their working contexts. There was no time for making a complete presentation of participants, so it was decided to make two rounds of this exercise and then making a big circle for making a quick presentation of everybody (just saying their names and organizations). This first exercise contributed to create energy and helped to make visible relationships between participants.

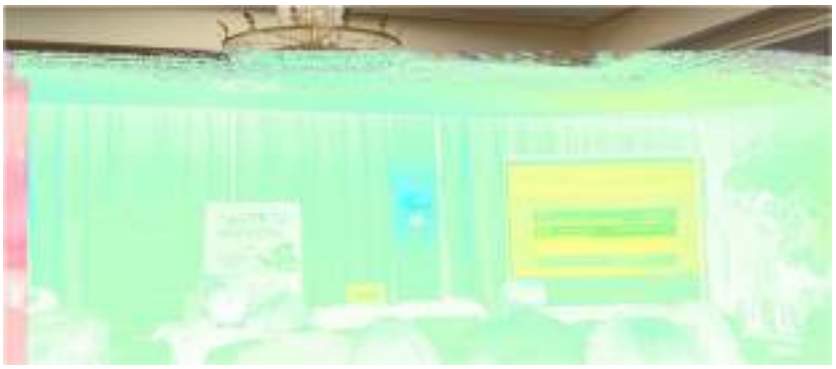


Figure 19 Jorge Muyo presenting Cantabria S3 strategy.

Afterwards, participants were encouraged to embrace (or not) the four domains of opportunity for RRI (Bieconomy, health and post-Covid-19 society, Blue Economy and Fair Energy Transition, Responsible Industry 4.0 and Territorial Sustainability and Responsibility) with an exercise that aimed to situate participants into these domains. Participants had to fill a sheet where they were encouraged to answer to three questions:

- Which is the most important domain for you and why?
- What past, present and future initiatives can be situated in this domain?
- Do you miss any particular domain, or would you like to reformulate any of these domains?

Figure 20 Participants in WS1 filling their sheets.

During this exercise, participants had to stick their sheets in several walls prepared for this occasion. That helped TECNALIA team to organize the working groups that were nurtured during the rest of the session. A rapporteur in each of the groups also presented the different contributions of participants to domains. After this exercise, participants were also encouraged to take part into a brainstorming session for identifying how can I contribute from my working context to this domain. Post-its were delivered to participants to contribute to this exercise and in the making, some participants decided to change their working group/domain. That was inferred by TECNALIA team as a nice check-up for their positioning into the lab (participants thought twice for making this decision). Participants had 10 minutes to produce ideas and allocate it to the preferred domain. After this, TECNALIA team distributed a set of gomets for introducing a voting poll mechanism into the event. Participants of the domains had two votes but other participants at other domains could also vote other ideas different for their domains (only one vote). This exercise contributed to identify the most popular ideas that will be developed into the next exercise in which several guiding questions were used to facilitate the prototyping.

Every working group was encouraged to select the most popular ideas in every domain (or at least one of the most popular ideas) and trying to answer to different questions fort developing it. Participants had around 45 minutes to meet these questions:

- **What do you want to achieve with this idea?**
- **What agents should take part on it?**
- **What barriers can rise?**
- **Which allies can help?**
- **How SODERCAN can support your idea?**
- **How this idea can be introduced into your organization? And in others?**
- **What it will be the next steps and timetable?**

After this activity, participants have some time to relax and enjoyed some food and drinks in nearby room. After the break (1 hour or so), rapporteurs of each group were invited to present their ideas to the rest of the group. When presenting their ideas, the rest of participants were also invited to provide feedback, questions, or comments to them. Here, an interesting discussion about how to promote citizen engagement and responsibility followed the presentation of several ideas what it was perceived by TECNALIA team as a “good quality control”.

Figure 21 Presentation of pilot action ideas by stakeholders

After this activity, TECNALIA team also presented the whole roadmap of the TetRRIS composed by a set of three WS that will be held from October 2021 to June 2022. SODERCAN also thanked all participants for their participation and involvement in WS1, as well as inviting them to WS2 to be held in the future.

Pilot ideas

The first of the ideas that emerged in WS1 are circumscribed around Domain 1 **"Bioeconomy, Health and Society Post Covid-19".** Under this domain, various R&I actors in Cantabria who carry out their activities in these areas were grouped together. The idea developed at this round table by the participants was to establish a forum oriented towards cooperation in the health sector, with the aim of becoming a meeting point for information and training, for the generation of synergies and collaborative projects in response to various social challenges in the health sector in the region. This forum aspired to receive the support of various partners in its development, such as regional, national and European governments, as well as involving various agents such as universities, technology centres and companies. It also aimed to involve social organisations such as patient associations. Finally, it also aimed to create common ground between different working teams of different organisations and with international connections.

Figure 22 Cooperative/Collaborative Health Forum pilot idea

What does this idea aim to achieve?
- Meeting point where synergies in the sector can be achieved
- To provide answers to social challenges
- To share projects and training

Which stakeholders should be involved?
- The whole of society, and within society, public entities, private enterprise, etc.

What barriers may arise?
- There may be a lack of information, a lack of knowledge about what the Forum is.
- Adequate information channels between the agents that can be part of the forum.
- Funding, not obtaining funding for the development of this activity.
- Culture of dissemination, overcoming that barrier to what health means.

What allies can support this idea?
- The regional, central and even European governments
- Universities, Technology Centres and Companies
- We must focus on social organisations.

How can SODERCAN support your idea?
- In an area of co-leadership and coordination
- In an area of impulse and dialogue
- Financing
- Promotion and dissemination of the Forum

How can this idea be introduced in my organisation and in other organisations?
- From our organisations, through a working team, we can contribute to a working strategy, which would be good to encourage exchanges and stays between the different organisations that form part of this forum.
- Include an international networking area to connect with similar initiatives that are being developed at European and international level.
- Including associations of patients or users of this health and bioeconomy, as we are in the field of social innovation.
- Trying to support the idea through a financial contribution.

What will be the timetable?
- The first step is to study previous experiences

- Secondly, a mapping of actors.
- Develop a strategic plan and a communication plan.
- Be very aware of the social challenges that can be linked to this forum.
- Make a calendar of actions and projects and transfer the idea internally.

Figure 23 Description of Cooperative/Collaborative Health Forum pilot idea

The second of the ideas that emerged in Workshop 1 was circumscribed around **Domain 2 "Blue Economy and Just Energy Transition".** Under this domain, various R&D&I actors in Cantabria who carry out their activities in these areas were grouped together. The idea developed by the participants at this round table was to change consumption patterns towards more sustainable processes. This idea tried to encourage organisations to consider aspects related to sustainability at a structural level. For example, the incorporation of hydrogen and aquaculture technologies to transform consumption patterns based on extractive fishing to aquaculture-based extraction. This initiative aimed to collaborate with various actors in civil society and with various actors in the regional innovation ecosystem.

Figure 24 Sustainable consumption model based on technological alternatives pilot idea.

What does this idea aim to achieve?

Using technology as a catalyst to change the consumption model towards a more sustainable one, through the example of technologies focused on hydrogen and aquaculture. The incorporation of technology into the sector can make this extractive fisheries-based consumption model more sustainable via aquaculture extraction.

Which stakeholders should be involved?

If we want to change consumption we have to count on civil society and if we want to do it through technological development, we have to count on public-private innovative actors.

What barriers can arise?

When trying to move towards a more sustainable consumption model, the main barrier is to encourage this model as opposed to the current one. The barrier may come from those affected by this change, society itself, with its acquired habits that may put up resistance to change.

The absence of a legal regulatory framework that allows a change to another model, facilitating the entry of technology as a vehicle to migrate to this new model.

What allies can support this idea?

The main ally could be society, and to mobilise it we will need the media. Social media influencers can be allies (e.g., Rafa Nadal). The need is created by society, the just energy transition comes from social demand.

The meeting forum in the cluster can be fundamental to achieve this.

How can SODERCAN support your idea?

As a dynamizing agent, involved in dissemination issues, as a cohesive lever between different agents that can intervene in this technological development for this sustainable consumption model.

As an incentive agent to support change through its leverage effect.

How can this idea be introduced in my organisation and in other organisations?

The idea is to encourage organisations to take into account aspects related to sustainability at a structural level and also to strategically encourage these organisations to think about joining the value chain, to join the supply chain of this new market opportunity associated with this change of model.

What is the timetable?

The Recovery Plan's own timetable can be a reference in terms of how this type of initiative can be implemented. The RIS3 regulatory framework (21-27).

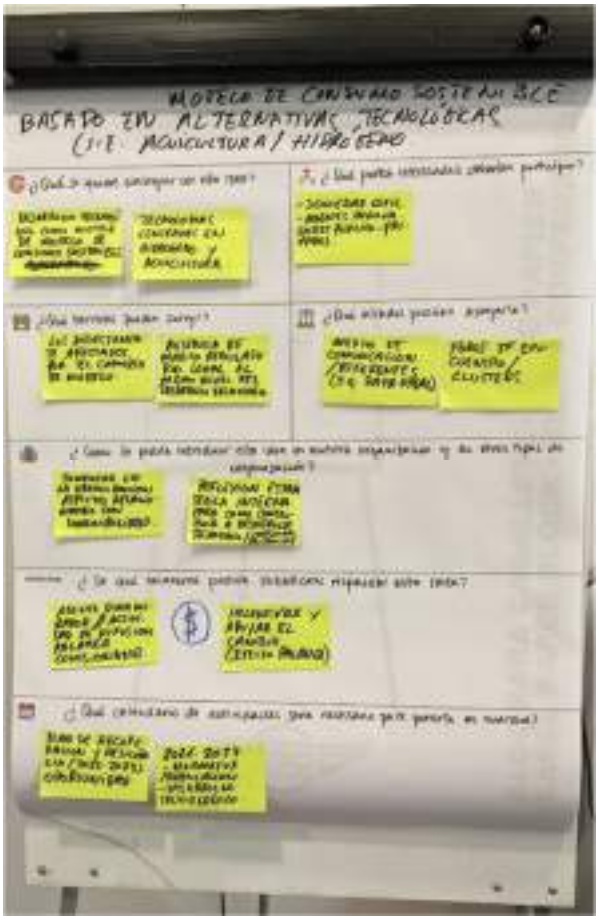


Figure 25 Description of Sustainable consumption model based on technological alternatives pilot idea.

The third of the ideas that emerged in WS1 around the domain "**Responsible Industry 4.0**" was oriented to digital skills. Various R&D&I actors in Cantabria who carry out their activity in these areas worked in promoting digital training at regional level through training programmes in digital competences. The aim of this initiative was to provide employment with added value, leading to greater competitiveness, improving the retention of talent in the region, and thus avoiding the brain drain. To this end, the initiative called for the involvement of companies in the ICT sector, but also other types of companies, training centres, universities, trade unions, business schools, financial institutions and education, employment and innovation departments.

Figure 26 Digital empowerment pilot idea

What do you want to achieve with this idea?
Employment must be value-added employment, there has to be speed in decision making, improve competitiveness in organisations, we have to be able to attract or retain talent and also improve internal processes, apart from this we need to take into account a good social reintegration.
Which stakeholders should be involved?
As a central driving force we should have the ICT companies, apart from the rest of the companies, training centres, education, vocational training and universities, trade unions, employees, business schools, financial institutions and the Ministries of Education, Employment and Innovation.
What barriers may arise?
The biggest barrier may be the resistance to change, it is difficult to get out of our comfort zone, but we must help to advance this change. Lack of funding and lack of coordination are very important to consider along with lack of knowledge and innovation culture. We do not know who can do what within Cantabria itself and this means that we often go outside to look for it. The complexity of technologies as we do not all speak the same language and terms. The ROI (Return on Investment) differential and the GDP differential, which are intangible.
Which partners can support this idea?
All the stakeholders mentioned in the previous question and the media and training centres, of course.
How can SODERCAN support your idea?
Apart from financially, institutional support is vital. As a coordinating body, as it is an agent that can help us all reach a consensus.
Providing training incentives and drawing up the Technological Training Map for the region and the sectors.
How can this idea be introduced in my organisation and in other organisations?
First, the Technological Training Map of the sector focused on each company could open our eyes and make us contemplate the existing need for training. Conferences and Dissemination Forums.

What will be the timetable?

We need short deadlines. The Technological Training Map should be the priority and have Training Plans by levels and sectors and an evaluation of objectives every six months and improvement actions to update this map and the training plans.

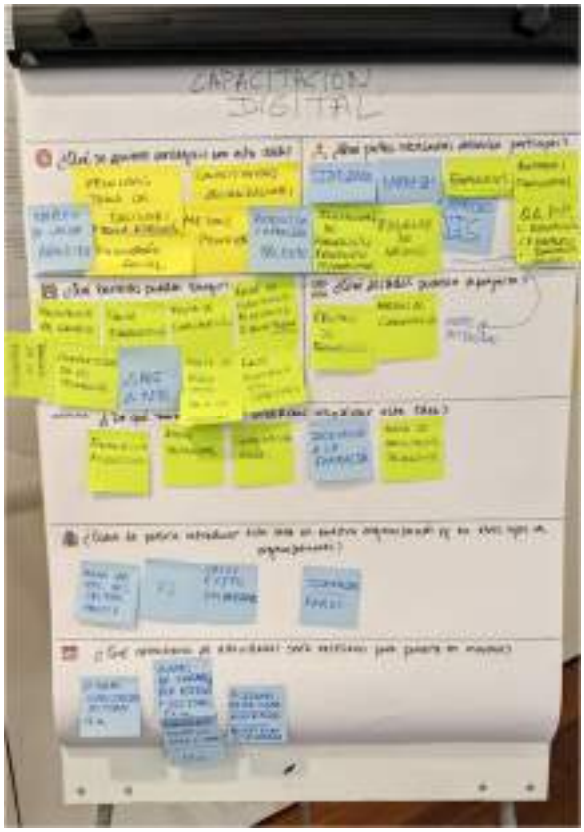


Figure 27 Description of Digital Empowerment pilot idea

The last idea to emerge from WS1 emerged around domain 4 which was called **"Territorial sustainability and responsibility"**. Under this domain, various R&I actors in Cantabria who carry out their activities in these areas were grouped together. The idea developed by the participants in this round table was to coordinate the activities already existing in the region in the field of sustainability. This idea aimed to promote education and training in sustainability to increase the impact and engaging citizens and the regional ecosystem around this idea. This idea aimed to involve a large number of actors of the Cantabrian society as it is a cross-cutting issue of general interest for the public of the region.

Figure 28 Sustainability Education pilot idea

What do you want to achieve with this idea?
Education and training are basic. It is the basis of the base; it is a cultural issue. The aim is to achieve a personal commitment that also requires a general change and a general awareness of citizenship.
Which stakeholders should be involved?
All of them, summarised as society as a whole: society, companies, trade unions, citizens...this has to permeate society as a whole.
What barriers may arise?
Time, we are already late. Education, training, and cultural change take a long time. Resistance to change, cultural change, egos, as everyone wants to keep their own plot of land. We get comfortable, it is very easy to go back to business as usual. We procrastinate.
There are many legislative and regulatory barriers that are a very important barrier.
What allies can support this idea?
It is society that has to support, but the media also have a very important role to play, especially social networks. Public-private partnerships will be key. All parties have to be well identified and well aligned, if we don't unite this is not going to work.
How can SODERCAN support your idea?
One thing it does very well is to unite, create alliances and bring the parties together so that we share.
Disseminate, promote good practices, hold workshops with companies and the training part, encourage visits to companies. Try to make SODERCAN the link between all the agents.
How can this idea be introduced in my organisation and in other organisations?
A small incentive can help us to get people to come in more. Try to create some types of support, especially within companies. Start with informative talks to act as a loudspeaker.
What will be the timetable?
We can't start thinking long term, we must start now, so everything we can do is important. Let's start by mapping good practices, easy things that we could start doing tomorrow. Let's not wait to create a super Plan, but let's start walking.
One solution would be to set up a platform for citizen participation like the city council or the university already has, but these activities need to be coordinated and we need to start doing things

together to be more efficient. The school calendar can be proposed, why wait for the next school year. We can propose feasible things that everyone in their own sphere can start to build.

Figure 29 Pilot idea description

2.Maturation stage

After WS1, a second workshop was designed and planned together between TECNALIA and SODERCAN. This WS2 was held on the 23rd of March of 2022 in Torrelavega. For the preparation of WS2, several actions and tasks were conducted to the design, conceptualization and setting up of the event. In this regard, there was a division of tasks between SODERCAN (logistics, recruitment, and catering services) and TECNALIA (WS design, facilitation and setting up) that helped in a great manner to meeting deadlines in a satisfactory manner. These actions were delivered and planned through different meetings and exchanges between TECNALIA and SODERCAN.

The development of the agenda was oriented to introduce the socio-economic impact of clusters through an invited talk by James Wilson (Orkestra). Cantabria is at early stages of clustering processes and the clusters already in place are not financially sustainable and are not very active in R&D. This was seen as an opportunity by TECNALIA team to make reflect to the Cantabria innovation ecosystem with an inspiring talk around cooperation between stakeholders into a quadruple helix-approach. Another need was spotted around RRI tools that can be potentially used and mobilized by Cantabria innovation stakeholders. To that aim TECNALIA team also developed a big catalogue of RRI tools that was also introduced by a brief presentation of this catalogue during the event for supporting participants in the development of their ideas. Last, TECNALIA also felt that

the ideas conceptualized in the first workshop needed a further iteration and a set of participatory, experimenting, and prototyping activities were developed towards this aim.

WS2 was designed to advance in the development of the ideas conceptualized in WS1 in Santander. In this regard TECNALIA team conceived an agenda that combined inspirational talks oriented to meet the challenges spotted of the diagnosis, as well as providing tools and resources that can be mobilized in the development of the ideas. TECNALIA work closely with SODERCAN to recruit participants in this event and to extend the invitations to the Torrelavega area. In this regard, new stakeholders such as local and regional development agencies, companies and start-ups were invited to attend to this WS2. WS2 was initially planned to have around a set of 20-25 participants from different sectors and domains of the R&I regional ecosystem of Cantabria. The recruitment process worked well but there were some last-minute dropouts with a final attendance of nearly 40 participants.

This was a good number for the participatory activities and dynamics at place.
The main objective of WS2 of the TetRRIS Lab in Cantabria was to further iterate the activities drafted in WS1. This objective was considered critical as there was some aspects of the ideas that were not fully conceptualized after WS1. Specially, the RRI aspects of them which were a bit unclear in most of them. In this regard, the design and contents of the event were oriented to promote these collaboratively pilot actions that can be feed into regional RIS3 policy. The number of participants engaged in the event, as well as their interest and energy demonstrated during this second workshop proved to be a valid test for the validation of these objectives. It is also important to acknowledge that the active involvement of political powers in the event as General Directorate for Innovation and General Directorate of Industry of Cantabria Government both attended the event.

Table 7 List of participants in WS2

PARTICIPANTS	STAKEHOLDER[2]	REGION	GENDER
40	Academia/research	Cantabria	28 Females/12 Males

Implementation

WS2 of TETRRIS Lab in Cantabria started with the formal introduction of General Manager of SODERCAN, Rafael Pérez Tezanos who gave a warm welcome to all participants and thanked their colleagues from SODERCAN but also from Cantabria Government and TECNALIA team to make it possible. His speech paid attention to the different changes that innovation policies have been implementing lately and with a special emphasis in responsibility and sustainability.

Figure 30 Opening speech by Rafael Perez Tezanos (SODERCAN)

After this brief introduction of five minutes, James from ORKESTRA took the stage to start his presentation. His speech was focused on the role of clusters for facilitating socioeconomic development and the role of evaluation as learning. James stressed how the original vision of clusters by Giacomo Becattini was oriented to promote socio-economic impacts and how this vision is now getting a momentum. Giacomo stressed the role of industrial districts as an aggregation of people and organizations for making an impact to a far extent than in economic terms. The talk also paid attention to the UN SDGS and how these objectives are becoming more and more important into their strategies. This is generating the need of allocating more and more resources for achieving this scenario.

Figure 31 James Wilson (Orkestra)

Afterwards, Ezekiela and Raúl took the stage for presenting a summarized version of a RRI tools catalogue developed for the occasion. This catalogue included a significant number of tools for deploying RRI aligned activities. The talk was a bit accelerated because the event started a bit later than expected for some delays of participants and TECNALIA team was forced to speed up a bit the presentation. After this presentation there was some time for questions and doubts. Several participants posed some questions for James around the composition of clusters and their EU networks. After this slot all participants were encouraged to have a coffee, do some networking and get some rest into a 15-minute coffee-break.

Figure 32 Ezekiela and Raúl talk.

After the break, there were some drop-offs (policy makers mainly) but not too many. TECNALIA conducted a group presentation of participants distributed in different working groups at desks. This activity started around 20 minutes later than expected and it was decided to not spend too

much time on it (10:55). After a recap of WS1 for the new participants and as reminder for WS1 participants made by Raúl, cooperative work in groups was started around the previously drafted ideas in WS1. There were some movements between participants to start working in other desks but after a brief period of some movements between desks the work in groups was started around 11:25.

Figure 33 Working in groups.

There was a lively ambient and a good mood in the room that helped to start working in groups. Some guiding questions were orchestrated for this first session oriented to reconnect the participants with the prior conceptualized ideas and with the themes of the domains of opportunity. These questions were:

- *How does it feel the prior idea in comparison with WS1? How it can be further elaborated now?*
- *How can we involve cantabrian society into the development of this idea? In which way?*

New participants and WS1 participants were engaged into conversations but also were encouraged to start drawing their ideas. To this aim, a set of different drawing materials, stickers ad other resources were facilitated to them. This helped to participants to embrace again their ideas and better define them. This exercise also helped to engage new participants and to be involved in the development of their ideas. It was also stressed that at the end of the event what it will be presented by groups will be the final drawings, not the development of other questionnaires facilitated by TECNALIA team to develop their ideas.

Around 12.00 TECNALIA facilitated a format with several questions that was intended to help participants to better define and concretize their ideas. This questionnaire included several questions aimed to involve Cantabrian society into their actions and using RRI tools in the next months. This set of questions was:

- Which RRI aspects tries to address this idea?
- What barriers we can face in the development of this RRI aspects into our idea?
- What opportunities can we find when facing this RRI aspects in our idea?
- What tools can be used for facing this RRI aspects in our idea? In which way?

- How SODERCAN can helps us in this process?
- What missing stakeholders today can be our allies for working into this RRI aspects?
- How this idea can be started during next months?

This format helped to participants to concretize their ideas and improving their drawings. Participants were effective into their actions and discussions, and we reached 13:00 with a detailed plan by each of the for working groups. After this activity, participants have some time to relax and enjoyed some food and drinks in nearby room. After the break of 15 minutes, rapporteurs of each group were invited to present their ideas to the rest of the group. When presenting their ideas, the rest of participants were also invited to provide feedback, questions, or comments to them. Here, some interesting questions and conversations were delivered between groups. Some participants of other groups offered suggestions for improvement and also provided critiques in terms of societal engagement, improving the involvement of citizens or other CSOs into the ideas conceptualized.

Figure 34 Presentation of pilot ideas by participants

After these presentations, TECNALIA team shared with all participants a survey about socio-ethical aspects of innovation and public values in research and innovation that was designed by other project partners. Later, the mayor of Torrelavega came to the forum to thank all participants for their attendance and make a brief speech about the role of collaboration for solving societal challenges. Last, SODERCAN team thanked all participants for its participation and encouraged to stay engaged in the project.

The conclusion of the event was positive. TECNALIA and SODERCAN teams agreed that the feedback from many participants was good and a core team of 12-14 participants were very engaged in the process. There were also 2 ideas that were further detailed and improved in WS2 that were in a good position to be deployed during the next months. There was also another one that needed more work to be deployed and another one probably out of the scope of the intervention,

but it can be addressed through minor actions. Anyways, the best outcome of the WS2 was that a group of stakeholders committed with the process itself. This was seen as a possibility to catalyse institutional changes in the innovation ecosystem towards a more open, sustainable, responsible, and collaborative attitudes at a later stage in the process and after the lifespan of the project.

It is also worthy to mention that in WS2 there were also present citizens. Some entrepreneurs and people looking for new job opportunities were involved in the working groups with R&I stakeholders. This helped to identify other kind of missing stakeholders in the development of the ideas. As it was agreed with SODERCAN during and before the event, it seems that there is no need for having a WS3 due to the fact that specific workshops have been planned for 2022 by the Cantabria Government for the deployment of the new RIS3 strategy. In this regard, it was agreed that SODERCAN and TECNALIA will take part in these workshops and both of them will reinforce collaborations with CISE which is the organization accountable for deploying these events. From now on, TECNALIA and SODERCAN will develop with specific subgroups identified towards the development of conceptualized ideas and its materialization.

Pilot ideas

Different participants that were present in WS1 and promoted the **Collaborative/Cooperative Health Forum** in WS1 also attended to WS2. These participants represented different regional stakeholders such as IBBTEC, CIFA, IDIVAL, CIMA and other institutions related with health, biotechnology, agri-food sector, and environmental issues. Around 8-10 participants worked together into the development of this pilot idea that in this WS2 was refined in detail.

Figure 35 #onehealth Cantabria forum pilot idea

With the name of #ONEAHEALTH Forum, participants were also able to detail a calendar of activities from March till the end of the year for setting up the forum. It is worthy to mention that the participants in this domain were really advanced regarding RRI and many of them had in place several measures and initiatives related with RRI principles.

Figure 36 Foro #oneahealth Cantabria drawing

Around 9-10 participants that were present in WS1 and promoted a pilot idea under the **Blue economy and Fair Energy transition** domain were also present in WS2 at Torrelavega. These

participants represented different regional stakeholders such as IH Cantabria, MARCA cluster and Sea of Innovation cluster among others related with renewable energies, shipping manufacturing and sailing technologies.

Figure 37 Idea conceived under blue economy and Fair Energy transition domain.

Participants worked together in the refinement of the pilot action trying to add milestones and steps necessary till the end of the year for promoting their idea. However, this pilot idea was not well-defined, and it has significant shortcomings for being developed under the TetRRIS project umbrella.

Figure 38 Cantabria Blue Economy idea

The third group worked in the **"Responsible Industry 4.0"** domain that promoted a pilot action around **"digital empowerment".** This pilot idea was discussed and debated with new participants as well as some participants that were also present in WS1. The idea got different inputs from new participants that helped the team to further developed this idea. Several companies such as Textil Santanderina and clusters such as MARCA and worked together in the development of this pilot idea. Around 6-8 participants worked during the whole day on it.

Figure 39 Drawing of "Digital Empowerment."

Forcing participants to make drawings and detailing their pilot actions make possible to achieve a high level of detail for promoting pilot actions to a next stage where SODERCAN can move forward with them for applying specific actions.

Figure 40 Digital skills empowerment idea

The fourth group worked in the **"Territorial Responsibility and Sustainability"** domain that promoted a pilot action around **"Sustainability education".** This pilot idea was discussed and debated with

new participants as well as some participants that were also present in WS1 such as the University of Cantabria, the Chamber of Commerce of Cantabria and some associations. The idea got different inputs from new participants that helped the team to further develop this idea. Initially planned into tertiary education, the idea moved to secondary levels as its main point of action.

Figure 41 Idea and Territorial Sustainability and Responsibility domain

The idea got different new inputs in this second iteration and more details were added to the initial conceptualization. It was commonly stressed that a dedicated forum such as a social innovation was also needed to trigger some kind of catalyser in the regional ecosystem.

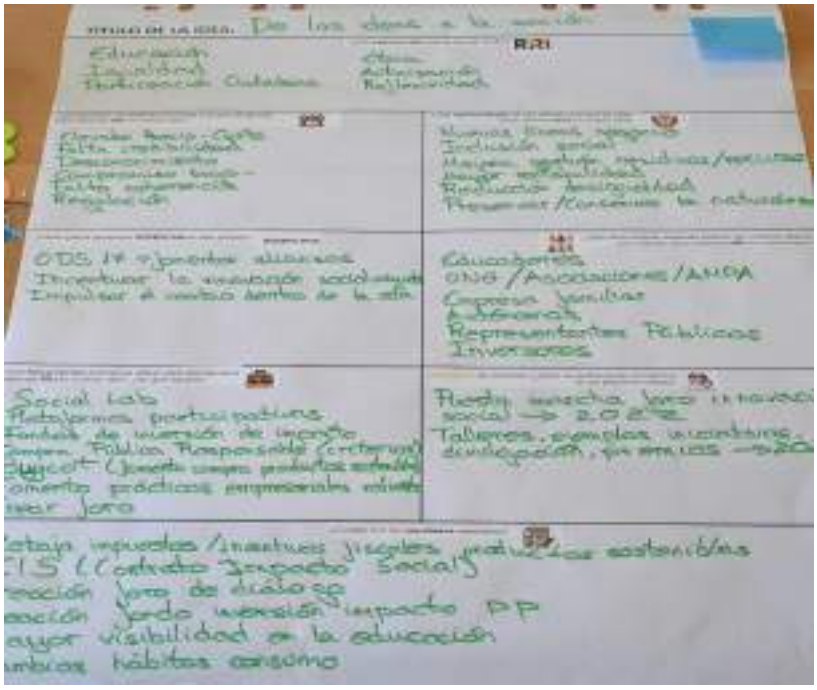


Figure 42 "Sustainability pilot action" Questionnaire

3.Consolidation stage

After WS1 and WS2, TECNALIA and SODERCAN met together to discuss the outputs of both workshops and how to continue the pilot actions. It was argued that specific actions in a two-way should be developed instead of organizing another workshop. This was due because the majority of pilot actions demanded of specific actions of regional stakeholders in coordination with SODERCAN. In addition, TECNALIA and SODERCAN became aware that participatory workshops will be also held by CISE with many of the stakeholders engaged in the prior workshops for developing the new S3 strategy of the Cantabria Government called "ICANN". In this sense, it was agreed that promoting a third workshop will not be useful for the project objectives. In this way a new strategy and operation mode surged after WS2 and based on these facts. SODERCAN started to work with specific stakeholders of the regional innovation ecosystem for implementing specific actions arising from the different workshops for each domain.

3.1 Bioeconomy, Health, and post-Covid 19 Society

For the first domain, **Bioeconomy, Health, and post-Covid-19 Society**, engaged stakeholders during the two workshops argued for setting up a collaborative forum for cooperating and creating a real network for all the regional actors involved in the health sector in some way. The General Directorate for Innovation, Technological development and Industrial Entrepreneurship of the Cantabria Government assessed this proposition and it positively considered that initiative. Under the name of "The Health Forum" a political action was taken for its development. This health forum has the particularity that it would involve to different regional ministries. The Industry, Tourism, Innovation, Transport and Commerce Ministry was involved in the TetRRIS project through the GD for Innovation, but not the Health Ministry. This initiative needed to be shared and confirmed by the two departments of Cantabria Government due to its strategic character before being implemented under the TetRRIS umbrella.

To carry out this initiative, three different meetings were held with DG Innovation. The objectives of these meetings were oriented to discuss the possibility and the initial content of a "Health Forum" and the different scenarios to start working. Meetings were held on the 18th of May of 2022 11th July 2022 and on the 7$^{th\ of}$ October 2022. After these meetings between regional stakeholders and the GD of Innovation it was confirmed the need of discussing this pilot action at the highest political level (Regional Ministry of Health and Regional Ministry of Industry). Upscaling the initiative to this political sphere took more time that planned and at the time that this report is being written no significant outcomes have been developed.

It must be also clarified the political priorities of these ministries are not focused on these issues since regional elections are expected next May 2023. Those responsible for the two Regional Ministers involved are from two different political parties (those sharing the Regional Government) what It makes difficult to reach an agreement in a short term.

3.2 Blue Economy and Fair Energy Transitions

The second domain identified for establishing cooperation between regional stakeholders was **Blue Economy and Fair Energy Transitions.** The pilot action promoted under this domain pivoted around the design and promotion of sustainable consumption models based on technological alternatives

such as aquaculture and hydrogen economies. The approach, operationalization and budget of this project was quite ambitious and out of the TetRRIS scope. Stakeholders engaged in this pilot action were also part of different initiatives that were promoting these kinds of technological developments at different funding programmes, and they were interested in aligning these actions.

Nevertheless, it is necessary to underline the positive experience and information exchanges of the different regional stakeholders that took part in TetRRIS social lab. This experimentation also coincided in time with the constitution of the Blue Economy platform of Cantabria which seems to be the most appropriate instrument to carry out this type of plans and actions. The platform has been promoted by the Maritime Cluster (MarCA) and the Sea of Innovation Cantabria Cluster (SICC) and is formed by 21 companies and regional institutions[3]. The main target is to encourage public–private cooperation between its members and promoting strategic plans and actions to boost the Blue Economy in Cantabria.

Figure 13 Blue Economy Cantabria Logo

SODERCAN as a member of MARCA and SICC clusters will be able to follow up the activities of the platform and supporting these activities as an external observer.

3.3 Responsible Industry and Fair Energy Transitions

The third domain operationalized during the TetRRIS project in Cantabria was **Responsible Industry 4.0**. The stakeholders involved under this domain quickly identified and agreed on promoting a pilot action that could be implemented during the project TetRRIS lifespan. With the name of "Digital Empowerment", this pilot idea was focused in creatin a platform for promoting virtual trainings and strengthening digital skills and employability of different collectivises, but also to pay attention to different socio-ethical issues that can emerge with disruptive and pervasive digital technologies such as AI or digital twins. This pilot action was focused on the industrial needs considering RRI as a key element. The main aspects of RRI discussed by the stakeholders promoting this idea were inclusion, equality and citizen participation throughout the process of training in digital skills.
The Sea of Innovation Cantabria Cluster (SICC) was selected to start the implementation of this initiative due to its diversity and scope. SODERCAN also considered that the activity could be carried out by the Cluster TERA that involves relevant regional actors specialized in IT. For this purpose, three meetings were held with Mr Roberto García CEO of AMBAR TECHNOLOGIES and President of the TERA cluster, from September to December 2022 (21st and 28th of September of 2022 and 6th of February of 2023). In those meetings both parties discussed the design of the training program, including socio-ethical aspects of digitalization and the group work develop at the last workshop in Torrelavega.

[3] For more information about it see https://www.clustermarca.com/proyectos/plataforma-blue-economy-cantabria/

After these exchanges and meetings between SODERCAN and TERA a tentative structure for the training programme proposal for digital empowerment was structured around two phases. A first one comprising a diagnosis of training needs in terms of digitalisation for the SICC cluster, analysing socio-ethical implications of the implementation of these technologies and their environmental aspects that was orchestrated around these points:

- Analysis of the SICC environment.
- Analysis of technological needs.
- Definition of a questionnaire for members of SICC.
- Analysis of the results of the questionnaire and assessment with those responsible for the most relevant training elements.

This first stage produced a report that gathered a definition of the training program for the members of the members of the SICC Cluster. This was due on the 13th of December of 2022. Following that outcome, a second stage was operationalized around a specific training on digital twins and their socio-ethical implications. This was due on the 6th of March of 2023 and structured around different elements such as:

- Definition of Digital Twin (Digital Twin - DT).
- Framework in Industry 4.0: Technologies, marketing, myths and truths.
- Applications and advantages of DT.
- How does a digital twin work? Know the principles, structure and basic architecture of a DT.
- The range of possibilities: available functionalities and technologies related.
- Implementation, use and maintenance of the DT, responsibility of all company members.
- Application of the "Digital Twin": Temporary integration planning.
- Past, current and future trends of the "Digital Twin"
- Legal aspects of digital twins
- Socio-ethical aspects of digital twins
- Societal impacts of AI
- Digital rights and digital divides

This pilot action has also allowed to join two clusters of Cantabria for working together on RRI and creating positive synergies around the socio-ethical implications of digital twins. After the TetRRIS project, the objective is to scale up gradually these training activities to other clusters and industrial associations with the aim to address different needs of sectors, considering socio-ethical issues of digitalization.

3.4 Territorial Responsibility and Sustainability

The last domain operationalized during the TetRRIS project in Cantabria has been **Territorial Responsibility ad Sustainability**. Under this domain, different regional stakeholders worked together during the two workshops on the definition of a pilot action called **"Sustainability Education".** This idea reflected the importance of the investment into sustainability education and how this should be a priority at regional level, also under the RRI approach.

With the aim of promoting environmental awareness, sustainable consumption and behaviour habits, SODERCAN proposed a pilot action oriented to young people in the region. In this sense, different meetings were held with regional experts involved in this topic that could fit in the proposal. This process took around six months to be defined into a pilot action, involving different professionals from the Chamber of Commerce of Cantabria (June-September 2022), The Social

MBA, a non-profit association specialized in social innovation (October 2022) and a non-profit company specialized in co-creation and societal impact initiatives oriented to territorial impacts (December 2022 and January 2023).

This last non-profit company, Translational Hub[4], has been chosen to work together with SODERCAN to implement the sustainability education pilot. This is aimed to define and set up a working process to promote the education and the training in sustainability field for increasing its impact and involving citizens and the regional ecosystem around this topic.

The methodology is oriented to understand in a deep way the challenges at stake and establishing a quality dialogue to promote a collaboration without tensions for favouring a systemic transition of value in the region. The proposal is structured in a cycle of workshops and practical activities, based on systemic thinking and the creation of spaces of trust, for addressing challenges with an inclusive perspective. The first phase comprises a diagnosis for analysing the territorial challenges of this topic as a complex system. The second phase is oriented to work on the specific problems with a multidisciplinary team created ad-hoc, but relying on regional experts, and going into detail for understanding and co-creating sustainable solutions. The workshops to be developed are:

1. 3D Map.
2. Interviews and experiences.
3. Prototyped.
4. Validation.
5. Dissemination.

Since this activity takes place into regional high schools, it was necessary to discuss the details with the Regional Education Ministry. Currently, this pilot is being developed and depending on the results, SODERCAN would scale up into another educational centres according to the school calendar or/and implement it in industrial companies, depending on its evolution.

3.5 ICANN

Additionally, and in relation to the lessons learned from the execution of TetRRIS, SODERCAN has had a reflection process about the challenges faced by the sectorial groups in order to integrate RRI aspects in the clusters funding programme for 2023, such as the promotion of a cooperation culture between the regional agents through cooperative R&D projects, the knowledge and experience exchange, equal opportunities and sustainable development.

As a relevant outcome of the TetRRIS project one aspect which might be highlighted is the inclusion of social innovation and RRI as an essential and cross-over topic to be developed, in the Cantabria's Smart Specialisation Strategy for the period 2021-2027, which was officially approved last December 2022 (but not published at the time this is being written) and known as **ICANN**[5]. TECNALIA and SODERCAN also were present at different participatory workshops held during the experimentation stage of TetRRIS. We have to remind that this was one of the motivations for not conducting a third workshop that was already scheduled in the initial planning of the TetRRIS experimentation. This was due to the different participatory workshops that were also developed by CISE with different regional stakeholders of the five innovation ecosystems that are orchestrated in

[4] For more information see https://translationalhub.org/)

[5] For further details see https://dgidtei.cantabria.es/actuaciones/detalle/-/journal_content/56_INSTANCE_DETALLE/3603955/12241979

this new S3 policy plan. Namely, **Blue Economy and off-shore Industries, Health and Welfare, Industry 4.0, Bioeconomy and Agri-foods, Cultural industries, and Sustainable Tourism.**

From November 2021 till February 2023, ten different participatory workshops (two per each innovation ecosystem) were developed and organized by CISE to engage regional stakeholders in the consultation of this new S3[6]. TECNALIA and SODERCAN took part in different workshops for exploring synergies within the TetRRIS project, promoting, and diffusing the RRI concept in the region, and making visible the work developed in the pilot actions of prior workshops hosted by SODERCAN. These workshops and the participation of SODERCAN and TECNALIA in them has been of critical importance for the dissemination, adoption and embedding of the RRI concept into the new S3 strategy.

Figure 44 ICANN sessions

Last, it is also important to mention that another of the outcomes produced by the TetRRIS project is itself related to the dynamics at place operationalized by the project. TECNALIA and SODERCAN meet regularly since the end of WS2 till the end of the experimentation stage. From October 2021 till December 2022 follow-up meetings of around one hour were held every 15 days between the two teams. The aim of these meetings was to support SODERCAN in the development of pilot actions, but also to provide guidance and assessment about different challenges that emerged during this experimentation stage. In this regard, it was several times discussed in these meetings, that regional stakeholders engaged in this experimentation perceived the participatory workshops deployed in the territory as a local continuation of the regional innovation forum deployed before the pandemic took place. This innovation forum was not so popular, and it did not work as planned because it was highly politicized (top representatives of institutions and companies) and it was too formal (for further details see Deliverable D2.2). There was no space for co-creation, co-design, stakeholder engagement or citizen engagement. It was many times argued by SODERCAN representatives that what TetRRIS social lab achieved during the project was the participation of a huge number of stakeholders that could continue what it has been set up by the prior regional forum. Then, providing a continuation for the regional innovation forum and stressing the importance of multi-stakeholder engagement processes.

6 See https://www.cise.es/programas-para-emprendedores/edps/

4.Reflection Survey

To evaluate the added value of RRI within TetRRIs project, a reflection survey with 15 questions around RRI implementation at current stage for each region was developed in order to be reflected at the middle of pilot actions (work package 4) and at the end of the project (work package 6). For Cantabria it was filled in by pilot partners (Sodercan) and scientific partners (Tecnalia) and the first-round results are presented below.

RRI dimensions	Item	RRI key performance indicators	Select	Score
RRI Awareness	1	Awareness of public and social values		
	2	Awareness of ethical issues raised by the pilot's innovations		
	3	Awareness of stakeholder views		
RRI Implementation	4	Stakeholder engagement (inclusion) - external stakeholders and third party networks (e.g. CSOs)		
	5	Employee engagement level in the pilot		
	6	Responsiveness) does the pilot respond to (new) societal demands and developments? - Capacity to align to societal goals		
	7	(Reflexivity) does the pilot embed public and social values in its innovations?		
	8	(Anticipation) does the pilot (actively) anticipate social effects of its innovations?		
	9	Transparency and accountability about RRI-relevant choices: is the pilot transparent about its RRI-relevant choices?		
	10	Diversity and gender equality		
	11	Does the pilot have mechanisms to address public and social values in service and product development?		
RRI Assessment	12	Risk identification and risk management		
	13	(Impact) assessment) does the pilot assess the environmental, societal, governmental, ethical, and legal impacts of its innovations?		
	14	Technology assessment (TA)		
	15	Is the pilot monitoring its RRI efforts and the consequences of these?		

Figure 45 Reflection Survey Tecnalia

Figure 46 Reflection Survey Sodercan.

6. Conclusion

Cantabria´s pilot plan has focused on four domains of opportunity identified for the diffusion and adoption of RRI concept in the territory. Through the Vrious workshops and knowledge transfer, it was argued that specific actions in a two-way should be developed. Overall, regional stakeholders engaged perceived the participatory workshops deployed in the territory as a local continuation of the regional innovation forum deployed before the pandemic took place. Although this innovation forum was not popular, since it was highly politicized and too formal, TetRRIS social lab achieved during the project the participation of a huge number of stakeholders that could continue what it has been set up by the prior regional forum. Thus, the importance of multi-stakeholder engagement processes was emphasized.

IV. Karlsruhe Technology Region: Generic information on the Pilot Actions

Public and private actors increasingly have to deal with citizen and stakeholder engagement and participation and see the value of a more intensive use of opportunities that arise from the involvement of broader groups of actors. Especially in the context of infrastructure development (e.g., for new energy or mobility systems) and in when introducing new technologies, social conflicts and resistance often arise that can ideally be defused through well-run participation processes. Participation can also be used to collect additional information inputs, thus leading to better development and innovation outcomes.

This is broadly recognised and has prompted stakeholders in the Karlsruhe Technology Region (KTR) to use participatory processes and generally to try to develop more sophisticated communication strategies in the context of local innovation and development projects. A substantial literature on public participation and communication now exists. But while theoretical knowledge gleaned from manuals has value, practical experience and insights from experienced practitioners is invaluable. So too is the ability to discuss own experiences among peers.

However, at the time when the pilot action was initiated, few structures existed in the KTR to facilitate dedicated dialogue and exchange among practitioner about participation, communication, and engagement issues. This gap became clear during the initial investigations ("mapping") of the region's innovation system and the role of RRI in it, in winter 2020/21, and was repeatedly articulated in the scoping workshops with actors and stakeholders from the KTR in spring and summer 2021. The value of a "safe space" to discuss experiences, successes, problems and failures, and get feedback from peers, became clear. To facilitate such exchanges and develop an appropriate structure, the TetRRIS project team in Karlsruhe therefore sought to build a "practitioner network on citizen and stakeholder participation".

The network was intended for stakeholders involved in innovation and development projects in the region, from business, public administration, (applied) research organisations and associations, civil society and intermediary organisations. While the network was also pitched to academic researchers and a significant number of academics ended up attending network events (cf. Tables 1 and 2), the intention was to avoid a primarily scientific orientiation and focus instead on practical, practitioner-oriented questions and discussions. The aim was to deepen practitioners' understanding of how to "do" public and stakeholder engagement (participation, communication), to help them better integrate public engagement into their innovation and development work.

Initially, the idea was for the network to only involve about ~10-15 people (plus TetRRIS project staff) to facilitate the creation of the trust necessary for very open exchanges among the participants. However, as the problem of public engagement and participation turned out to be highly relevant for many stakeholders, the network was opened to a wider range of actors from across the whole Karlsruhe Technology Region.

In practice, the network evolved into a small core who attended all events, and a much larger "floating" population of network members who attended events on an ad-hoc basis, depending (presumably) on interest in the particular topic and time availability. About 20 people attended

each event held sofar. These include stakeholders from business, academia, politics, associations and intermediary organisations, and civil society. Thus, a broad range of perspectives and expertise was represented in the network (see Table 12 for a detailed overview). A concerted effort was made to achieve a balanced gender representation among network participants, but ultimately the gender balance remained at ~40% female to 60% male (Table 13).

The primary goals of the "Practitioner Network" was deepening local innvation and development actors' knowledge and understanding of public and stakeholder engagement, and fostering personal and professional ties and a network among local actors with an interest in public and stakeholder engagement. This includes exchanges of experience at the organizational level on contacts, networks, cooperation partners and support structures, as well as exchanges of experience at the substantive level on recent activities, best practices, and challenges. "Engagement" was construed as encompassing both *communication* (i.e., informing stakeholders and the public at large about what e.g., an innovation project was doing) and *participation* (involving them in some way in the design, implementation and even decision-making in and about the project).

The format chosen to realise these goals was a series of workshops. Each workshop was devoted to particular aspects of public engagement and followed a common format: after some words of welcome, two or three keynote presentations were given by invited external speakers or by network members, on the topic(s) of the day. These were followed by a Q&A session, and then by a short break. This was followed by a second, more interactive part of the workshop. This mostly took the form of splitting the participants into smaller breakout groups, which would discuss aspects of the keynotes and the topic of the day, with a focus on relating them to the participants' own work and experience. These sessions were usually led by the keynote speakers. Afterwards, results and insights from the breakout groups were reported to the group as a whole. In one workshop, the breakout sessions were instead turned into a roundtable discussion among all the participants, as this seemed most suitable given the available room space. All workshops closed with an opportunity for networking among the participants.

Table 8 Number of Participants by Stakeholder Type

Stakeholder Type	**Number of Participants**
Public Administration	14
Business	18
Research	14
Associations and Civil Society Organisations	5
Intermediary	5

Table 13 Number of Participants by Gender

Gender	Number of Participants
Female	23
Male	33

1. Pilot actions

Practitioner Network Pilot Action Description

The Karlsruhe Technology Region as a prosperous innovation system within Germany consists of numerous actors from science, business, politics, and civil society who have built up close ties, cooperation, and knowledge exchange among themselves over the years. However, with regard to the increasingly important topic of citizen participation, relevant actors articulated the need to benefit more from diverse experiences made in different contexts and projects. Based on the scoping workshop and the existing structures of the TechnologieRegion Karlsruhe GmbH (a TetRRIS project partner and the main regional action alliance of companies, chambers, scientific organisations, and municipalities), interested stakeholders were brought together as a practitioner network. With the support of the TetRRIS project partners, several workshops were held on different topics, which are described in more detail below.

The pilot action was conceptualised in scoping workshops and small-group meetings in spring and summer 2022. The pilot action was begun in early 2022 with a kick-off workshop for TetRRIS project staff from Fraunhofer ISI and TechnologieRegion Karlsruhe GmbH plus core members of the practitioner network from among the local innovation/development actors, to decide on what topics were to be addressed in network events in 2022 and agree formats and the number of events. The workshop format described above was chosen as the most appropriate. While each workshop addressed different topics, care in terms of content, however, these build on each other, creating a consistent structure.

Workshops were held at quarterly intervals, as the local actors involved in the network stressed that a more frequent schedule would likely exceed the amount of time and resources the (volunteer) network members and participants from among the regional innovation actors could commit, given that their efforts were not remunerated. The content-side of each workshop was prepared by a team of two Fraunhofer ISI staff plus two volunteers from among the local actors in the network "core" prepared the content-side of each workshop (researching themes and concepts within the workshop's topic, identifying speakers and helping them prepare their talks, planning breakout sessions with the speakers, moderating the actual workshop, etc.). The mixture of scientific as well as practical knowledge proved to be very advantageous, as it allowed the state of research to be mirrored with concrete projects within in the Karlsruhe TechnologyRegion. This not only facilitated a transfer of knowledge between the actors but also highlighted examples, opportunities and limits of application. Staff from TechnologieRegion Karlsruhe GmbH were responsible for the organisational side of the workshop including outreach (coordinating dates, booking rooms, catering, contacting actors, documentation, press releases and public relations etc.).

The ***first workshop,*** held on the topic of "*Successful project communication between marketing, co-creation and technology acceptance: The example of efeuCampus*" in spring 2022, kicked off the activities of the practitioner network citizen and stakeholder participation. Approximately 20-25 individuals from the local science, business and public administration communities attended (see **Error! Reference source not found.**). The workshop focused on the experience of efeuCampus (https://efeucampus-bruchsal.de/), a local innovation project and "living lab" that develops small autonomous robot-like vehicles for last-mile packet and goods logistics in an urban setting, with experimental deployments in the "real world" of a local town quarter.

The event began with three keynote talks of 10-15 minutes each:

1. " Successful project marketing using the example of efeuCampus Bruchsal"
2. " Putting the robot on the road together: Co-Creation and Community-Building at efeuCampus"
3. " Sharing the sidewalk with the robot: Acceptance of new mobility technologies".

EfeuCampus Bruchsal project leader, Thomas Anderer, and then-head of the efeuAkademie Philipp Reichenbach, who presented on their communications and engagement strategies, gave the first two of these talks. In particular they discussed how their communications approach sought to not only communicate information to "passive" citizens but focused instead on involving the local community in the project work. These rather practically oriented talks focused on the "how-to" of citizen engagement processes, were followed by a third lecture, by Dr. Uta Burghard, a local social scientist unconnected to efeuCampus, who mainly studies public acceptance of new sustainability technologies. She presented on key insights and conclusions from the scientific literature on drivers and blockages of public acceptance, and how the public may be productively involved in innovation projects and surrounding social conflicts handled. Q&A followed this.

The discussion was then deepened in two parallel breakout sessions focusing on project communication and on technology acceptance questions, respectively. The sessions were led by the efeuCampus Bruchsal and efeuAkademie project leaders (project communication), and by Dr. Burghard (acceptance). Conclusions from the sessions were then presented to the entire group. Decisive factors for successful participatory approaches were seen, among others, in an early communication and involvement of citizens, maintaining neutrality of the implementing organization and avoiding of emotional conflicts. The event closed with an opportunity for informal interaction and networking among the participants and the speakers.

Feedback from participants was very positive. The topics were regarded as very important, as public engagement and participation plays an increasing role in the region's approaches to energy and mobility sustainability transitions, and participants much appreciated the opportunity to learn about how other actors approached this topic in diverse project environments. The chance for dedicated topic-specific networking was also seen as valuable. Not least, for many participants, it was also the first in-person event after more than two years of the coronavirus pandemic. The need for discussion was correspondingly high,

Figure 47 Participants from the 1st Workshop, on "Successful project communication between marketing, co-creation and technology acceptance: the example of efeuCampus Bruchsal" (Photo @TRK GmbH)

The ***second workshop*** took place in summer 2022, and again was attended by about 20 individuals, some of whom had already attended the previous workshop, some of whom were new. After the previous workshop's focus on project communication, the focus this time was on public *participation*. The topic was "*Participation in Practice: Aims – Challenges – Formats*". Like the previous workshop, this one too began with three keynotes, by Christian Eheim, the mayor of the local community of Graben-Neudorf; Dieter Bürk from the local chapter of the German Trade Union Confederation (DGB), and Rimbert Schürmann from PTV Group, a major mobility/transport consulting company headquartered in Karlsruhe. All three had been asked to speak, from their perspective, on *"What does the ideal participation process look like?"* The different perspectives made it possible to understand which participation formats the stakeholders are already implementing, which best practices exist and where the greatest challenges are seen. Again, the keynotes were followed by an extensive Q&A.

For the following interactive part of the workshop, two breakout sessions – one on challenges and participation formats; one on measuring success of participation; both moderated by a "tandem team" of network core members and Fraunhofer ISI staff – had been planned to run parallel to each other. But due to the considerable interest of the participants in both sessions, this was turned into a collective group discussion, with the topics of the two sessions addressed in succession. The workshop again ended with time for informal networking.

The ***third workshop*** of the *Practitioner Network Citizen and Stakeholder Participation* took place in autumn 2022. The topic was again public participation, this time with a focus on the scope for participation to help manage social-political tensions and conflicts surrounding. The event was entitled "Not in my backyard: Conflict resolution in space-related innovations and large-scale technical facilities: Experiences and recommendations from practice". The workshop was begun with keynotes by Prof. Dr. Eva Schill from Karlsruhe Technology Institute, who spoke about her own use of citizen science and dialogue events when running research and innovation projects in the KTR on geothermal energy, and Dr. Michel-André Horelt from Team Ewen GbR, a consultancy focused on public participation in policy making and infrastructure

development, who spoke about how to manage and modulate conflicts, focusing on wind-energy development. The keynotes were followed by Q&A, and then a broader discussion about how to integrate the public at large into policy making, especially about local and regional infrastructure, development, and science projects, and how to manage attendant conflicts. Again, the workshop was concluded with a networking opportunity.

As had already become clear from the previous workshops, participants perceived a great need for knowledge and discussion about the question of productive management of social-political conflicts, which are inherent in public participation. Workshop participants generally considered better understanding of how to manage public participation so as to respond to legitimate concerns while also avoiding becoming paralysed by "NIMBYism", to be a central challenge for the sustainability transition in energy and transport, and for infrastructure and science and technology development more generally.

The fourth workshop of the Practitioner Network Citizen and Stakeholder Participation took place in Spring 2023. There were almost 20 participants, including the project managers of several of the Karlsruhe Technology Region's flagship projects, that have just begun. The focus was on reflecting on the key results of the Practitioner Network pilot activity and conceptualising how regional actors may build on these to further develop participation activities and communication concepts in the KTR, especially in context of the new flagship projects, and how and whether the network might be continued beyond TetRRIS, to serve the new flagship projects. Dr. Petra Jung-Erceg from the TechnologieRegion Karlsruhe GmbH provided insights into the regional development concept of KTR. Dr. Nicholas Martin from Fraunhofer ISI gave a summary of the main themes and conclusions from the previous three workshops. Daniel Wensauer and Elke Wensauer-Sieber from Sieber-Wensauer consulting company moderated the following discussion and interactive sessions.

Based on the results and experiences from the previous practitioner network workshops, it was discussed which goals and target groups are relevant for citizen and stakeholder participation in the regional development concept of the TRK. It was decided to establish a format for regular exchange about issues of communication, public engagement and participation among the flagship project project managers, loosely modelled on the Practioner Network.

Figure 48 Discussions among the participants during the third workshop of the Practitioner Network Citizen and Stakeholder Participation, in autumn 2022 (Photo @TRK GmbH)

Figure 49 Presentation during the fourth workshop of the Practitioner Network Citizen and Stakeholder Participation, in spring 2023 (Photo @TRK GmbH)

Figure 50 Interactive session during the fourth workshop of the Practitioner Network Citizen and Stakeholder Participation, in spring 2023 (Photo @TRK GmbH)

Challenges

Public engagement as one of five keys of the RRI concept is of central relevance for the stakeholders of the Karlsruhe Technology Region. Without neglecting other dimensions of responsible research and innovation, the importance of involving stakeholder groups in particular has emerged since the start of the TetRRIS project. On the one hand, this is because the RRI concept is difficult to grasp in its complexity and therefore a focus on certain aspects seemed to make sense for the stakeholders involved. On the other hand, the region is

characterized by much de-facto RRI, with citizen participation and engagement across stakeholder groups repeatedly seen as crucial to understanding innovation and development processes in their entirety and achieving the greatest sustainable impact. The latter is particularly crucial in times of multiple crises and associated uncertainties.

During the workshops, there have been lively and constructive discussions on citizen participation. The network was able to provide initial ideas in a protected setting in order to exchange knowledge about activities among the network partners. The network on citizen participation consists of a diversity of actors and stakeholder groups, representing all parts of the Karlsruhe Technology Region. With regard to the content of the discussions, three topics emerged that represent the main (interrelated) challenges for expanding citizen participation activities in the future and using them to increase acceptance of innovative projects and ideas.

A first essential element of successful citizen and stakeholder participation is a clear, transparent, and consistent ***communication*** strategy, including ***early consultations*** with stakeholders and the public at large. This leads to the project managers getting a feeling for prevailing opinions and a multitude of different perspectives. At the same time, this helps avoid a situation where fundamental objections get raised at a late stage of a project, when it is hard to integrate their concerns. To reach various groups of stakeholders, different communication channels should be chosen, whereby communication throughout the entire process – from the beginning of the project to its implementation – is elementary. A lack of activity and continuity of public communication is not helpful. At the same time, participants in the practitioner workshops pointed out that communication needs to be as neutral and factual as possible.

A second topic that was intensively discussed revolved around social-political ***tensions and conflicts***. Conflicts are a central characteristic of public participation and occur in every project phase. These arise from diverging interests, values, and understandings, which become apparent during participation activities. Conflict intervention and conflict moderation are therefore important to successfully reconcile diverging interests and perspectives. However, this requires that the citizens involved are taken seriously and are given a certain amount of responsibility to work out their own ideas. Project leaders should then take up the ambivalences and clarify them if possible. To this end, transparent and clear decisions are necessary that incorporate as many perspectives as possible and do not run counter to the project goal.

Thirdly, both appropriate communication and adequate handling of conflicts can only take place based in suitable ***participation formats***. These play a central role, as they at best facilitate respectful and non-hierarchical dialogue between project managers and the public, combine interactive and innovative elements, and contribute to the understanding of opposing positions. This can include citizens' councils, dialogue rounds or round tables, as well as opportunities to visit or experience the technology or installations in question in a real-world environment (e.g. in the case of wind energy, visiting existing wind farms) . The latter was successfully implemented in the case of the efeuCampus Bruchsal by testing and demonstrating mobility solutions in the form of delivery robots (e.g., for logistics) to the public. This created a direct dialog with residents, who were able to ask questions and experience new transportation solutions, which could already reduce present concerns. Participants at the first practitioner network workshop were also able to realize their own project ideas in a break-out session, giving insights on an innovative participation format (see **Error! Reference**

source not found.1). A key take-away was that participation formats need to be adapted to the challenges at hand. However, since this requires experience, the exchange between the stakeholder groups in the Karlsruhe Technology Region is an important first step that – to strengthen RRI activities – should be intensified in the coming months. Whether and to what extent this is possible depends also largely on political support.

Figure 21 Participants in the first Practitioner Network workshop developed their own ideas and formats for citizen participation (Photo @TRK GmbH)

Follow up and future activities

The final workshop of the "Practitioner Network" was held in spring 2023. A key question for this workshop was whether and in what form the "Network" would be continued. While participants in the previous workshops had generally expressed considerable interest in their continuation, a key challenge is how the work burden of doing so, and the attendant costs, may be borne. These were covered by the TetRRIS project in 2022/2023, but neither Fraunhofer ISI nor TechnologieRegion Karlsruhe GmbH are able to take on this task outside the scope of TetRRIS. The network members and workshop participants, meanwhile, attended on a purely voluntary basis, for free. It was thus unclear whether network members would be willing to invest their free time and private money into continuing the network activities. The option identified in advance of the last workshop was to potentially continue network activities within the framework of other projects that are currently starting in the region. This idea indeed also met with some success: the project managers who attended the workshop decided to establish a format for continued exchange about issues of communication, public engagement and participation and coordination of activities across projects, that should meet at regularly intervals. In particular, the project managers and the leadership of the TRK GmbH decided, that the topic of stakeholder and citizen engagement should continue to be actively

pursued within the context of the regional development strategy, building on the insights developed in the 2022 workshop series.

More broadly, the perspectives and knowledge generated by the Practitioner Network workshops have made numerous actors and stakeholders in the region more aware of the value and possibilities of public engagement, participation and RRI in general. They are thus better placed to integrate these into their own future work, even without dedicated help from the TetRRIS team. Finally, the "Practitioner Network" has helped to position the problem of public and stakeholder engagement and participation (as well as RRI in general) more clearly within the purview of the TechnologieRegion Karlsruhe GmbH (TRK GmbH), which is the main innovation and development-related intermediary organisation in the region. It can thus be expected that public engagement and participation will receive increased attention in the TRK GmbH's work going forward and thus play a larger role in regional innovation and development strategy.

Pilot Action 2: The exchanges between Tampere and Karlsruhe – Basic Information

During the course of the TetRRIS project, many parallels emerged between the regions of Tampere and Karlsruhe in terms of their structural characteristics (actor constellations, technological and sectoral patterns, innovation capabilities, etc.). Against this background, several consecutive exchange formats were launched in late 2021. The meetings have helped the regional representatives to get to know each other and to understand the respective other's regional circumstances, for example with regard to governance and economic structure, as well as each other's organisations. For the main purpose of developing common areas of interest and action as well as cross-regional collaboration activities, a mutual understanding of the other region was fundamental, especially since some of the participants are not directly involved in the TetRRIS project.

The TetRRIS project team of each region initiated the exchange activities as well as considering and integrating other public and scientific partners. For the Tampere region, these include VTT, Business Tampere, Tampere University, Tampere City Region, the Council of Tampere Region and the SIX Initiative. For the Karlsruhe Technology Region Fraunhofer ISI, TechnologieRegion Karlsruhe (TRK) GmbH and the FZI Research Center for Information Technology were involved. In particular, the exchange between the public partners as well as the research participants turned out to be very valuable, as these formats open entirely new possibilities that would not have come about without the pilot activities.

In challenging times of climate change and the associated need for energy and mobility transitions, (knowledge) exchange and learning from practical experience across regional borders is of central importance. The collaboration between Tampere and Karlsruhe is a crucial step to create a platform for mutual learning and to exchange ideas that are necessary to increase innovative change at the regional level.

The participants from the regions of Karlsruhe and Tampere agreed to establish a network to improve knowledge and inter-regional cooperation across countries, which should promote change at the institutional level (within regional development organizations) through the exchange of knowledge, ideas and experiences. It is precisely the different institutional and political circumstances that lend themselves to the regions being able to benefit from each other. In several brainstorming workshops common areas of interest for exchange and potential collaboration were identified. In particular, RRI (Responsible Research and

Innovation) topics of participation and responsibility and their different aspects/dimensions stood out.

Implementation and challenges

Among the key events of the Tampere-Karlsruhe exchange was the joint organisation of a workshop at the High-Level Forum (HLF) in Tampere in November 2022. The HLF Summit is an annual face-to-face meeting of delegations of international innovation ecosystems (representatives from governments, higher education, research and industry). The annual summit provides opportunities for the participants to interact, share knowledge and strengthen connections with experts from various fields around the world. At the event, the two TetRRIS partner regions represented themselves alongside nearly 30 innovation ecosystems from 5 continents. The 2022 edition of the HFL on “How local & regional innovation ecosystems support 2030 global objectives” suited well to the ambitions and approaches of tetRRIS, especially since the HLF agreed on the importance of responsible innovation to achieve the 2030 Development Goals.

The planning of the workshop by the TRK, Council of Tampere Region, and Technical Research Centre of Finland (VTT), in collaboration with the University of Oxford / OxLEP from the HLF community started in mid-2022. Since the TRK had already participated in the HLF several times in the past, the event could be planned based on its experience. For the Tampere region, on the other hand, it was the first participation. Preparation was supported by participation in a policy lab in Brussels in October 2022 by both TRK GmbH and Tampere staff. In line with other pilot actions of the TetRRIS project and the conference theme, the workshop’s focus was placed on stakeholder engagement. Under the title "How can engagement enhance responsibility?" (see Figure 6) the added value of extensive and diverse stakeholder groups in innovative processes was first discussed as a key to responsibility in innovation. In a more interactive part, the audience could then discuss and vote on examples of good practices from different innovation systems.

Immediately after the HLF Summit, representatives of the regions of Tampere and Karlsruhe had an in-person meeting, to discuss further ideas and identify collaboration opportunities. Commonalities, differences and potential synergies were discussed along important topics and challenges such as the mobility and energy transition, digitization and the shortage of skilled workers. On this basis, the exchange can be intensified.

Figure 52 Presentation by staff from Karlsruhe and Tampere at the High-Level Forum Workshop (Photo @TRK GmbH)

Follow-up and future activities

In order to deepen the relationship between the two regions, several activities have been considered. For example, a return visit to Karlsruhe by representatives of the Tampere region has been discussed, as well as further (digital) exchange formats. Issue areas of interest include inclusion, public and stakeholder engagement practices, innovation scouting, matchmaking between companies, and opportunities for future joint projects. Business representatives showed an interest in getting to know suitable companies, for example through an on-site visit. This may also be reflected in the two regions' respective development strategies. It is hoped that these activities can be sustainably resourced also after the end of the TetRRIS project.

2. Reflection Survey

To evaluate the added value of RRI within TetRRIs project, a reflection survey with 15 questions around RRI implementation at current stage for each region was developed in order to be reflected at the middle of pilot actions (work package 4) and at the end of the project (work package 6).

For Karlsruhe it was filled in by pilot partners (TRK GmbH) and scientific partners (Fraunhoffer) and the first-round results are presented below.

Figure 53 Reflection Survey Fraunhoffer

Figure 54 Reflection Survey TRK GmbH

3. Evaluation

How do you rate presentations at the event? (1 very low -5 very high)

5

How do you rate participatory dynamics at place? (1 very low -5 very high)

5

Do you have any suggestions for future events? (Topics, events, dynamics, etc.)

One topic that we had expected to be of considerable interest to Practitioner Network participants, was the use of digital tools in the context of public engagement and participation. To our surprise however, when we suggested dedicating a workshop to this topic demurred. They regarded other topics as more pressing. However, it seems that this topic might deserve more focused attention in future.

4. Karlsruhe Technology Region Pilot Action Reflection and Conclusion

Starting from a large number of de-facto RRI in innovation projects of science, business and politics, public engagement plays a special role. This is due to the overarching nature of public engagement, which is relevant to a wide range of projects. Accordingly, the need for knowledge on best practices is high among the Karlsruhe Technology Region stakeholders. The exchange of knowledge and experiences among actors via a practitioner network and cross-regional initiatives can accordingly be seen as a direct response to these needs. Through the workshops and networking events in the past year and a half, diverse perspectives on different aspects of citizen participation could be exchanged and deepened. As a result, the actors have found the activities very profitable, especially the mixture of knowledge transfer (via presentations and interactive sessions) as well as networking

activities. It is desirable that the regional actors and their support organisations continue to support the activities (financially or otherwise).

As discussed in Deliverables 3.1 and 3.2 of the TetRRIS project, deepening the practice of RRI in the Karlsruhe Technology Region (KTR) faced several challenges. Partly, these were structural and largely external to the region and thus mostly outside local actors' scope to affect change, but partly also internal to the region and thus potentially amenable to local action.

On the structural and external side, one key challenge is the distribution of power and decision-making authority between different administrative levels. While the level of the different administrative districts that make up the Technology Region varies somewhat, they are generally situated at the lower levels of the German administrative hierarchy. For many purposes, the KTR is a rule-taker, not a rule-maker, and a site where policy decisions taken at higher levels are implemented, rather than a policy *making* site in its own right. This is particularly relevant for public engagement and participation, especially with infrastructural projects: when these are decided at higher levels and then simply pushed through "above the heads" of KTR decision-makers, there is obvious little scope for engagement of the local population.

A further structural challenge that is effectively beyond the scope of regional actors to alter, are funding requirements and structures of innovation and development-funding organisations. While these increasingly require projects to include dedicated communications and engagement work packages, it is rather rare for funders to *also* be willing to allow the public, via the engagement process, to meaningfully shape the outcome of the projects in question, especially in unforeseen ways.

Finally, the varying level of interest of citizens and stakeholders can present a fundamental challenge for public engagement and RRI in general. Participation and engagement of the public is possible only if the public is interested to show up. As became clear during the preliminary "mapping" interviews (D2.2 and D3.1) and discussions at Practitioner Network workshops, this cannot be relied upon. Motivating the public to engage requires well-thought-out strategies and communication approaches.

On the internal and non-structural side, D3.1 concluded that the challenges.

[mostly] revolve around the knowledge base within the innovation system regarding the "how to" questions: How to include or engage citizens or public stakeholders in … How to ascertain that, beyond voicing personal opions, they can make relevant, productive contributions that help to improve projects in substance? How to anticipate, manage and respond to public opposition or conflict between stakeholders … How to consider gender and diversity aspects in public engagement activities, and how to think about representativeness? How to set up an education campaign that avoids well-known pitfalls? In other words, how to design and conduct concrete activities of engaging and including citizens and other stakeholders within an R, D & I project, even in the case where the best possible framework conditions are already given?

While structural challenges of the division of administrative power and funding requirements are fundamentally beyond the scope of TetRRIS to address, the "Practitioner Network" pilot action set out to address the internal problem of local actors' lack of knowledge about the "how-to" questions of public engagement and participation. In as far as one key "how-to" question treated in the workshops was "how to engage people", this in turn addressed the challenge of citizens' and stakeholders' varying levels of interest and desire to engage.

The “Practitioner Network” made important contributions to overcoming these challenges. Through the invited key-note presentations from expert speakers and the subsequent discussions and interactive workshop sessions, it deepened local actors’ understanding of the potentials and practice of public engagement and participation, and provided them with practical knowledge, ideas, best practices and inspiration for how to conduct public engagement activities in the context of their own work, as well as greater awareness of the resources and knowledge related to public engagement available within the region and beyond. It also stimulated the formation of new topic-related personal linkages among the local actors. Moreover, it put public engagement more clearly within the purview of the TRK GmbH. All this provides a strong basis for more and better public engagement actions as well as related RRI activities (especially science education) in the work and projects of the KTR actors going forward. Finally, the exchange between Karlsruhe and Tampere as a second pilot action showed how similar the regions are in terms of challenges, even though the internal structures differ. The mutual understanding thus achieved has provided a basis for stronger cooperative activities going forward, also beyond the life of the TetRRIS project.

However, in the course of the Pilot Actions it also became clear that there are limits to the impact the “Practitioner Network” and “Tampere-Karlsruhe exchange” have been able to make. Going forward, the greatest challenge for both pilot actions to make an ongoing impact beyond the immediate learnings and linkages achieved in the 2022 and 2023 activities, has turned out to be the difficulty of sustaining a high level of active participation on a purely voluntary basis. Running networking activities, exchanges and events like workshops involves a non-trivial amount of work – scheduling meetings, managing memberships and email lists, researching topics and defining programs and agendas, organising speakers, booking rooms and catering etc. – and also generates monetary costs (e.g., room bookings, travel). These were covered by TetRRIS staff and funds for the duration of the project, with additional support from the (voluntary, unpaid) group of Network core members. While the Network events generated much interest among the wider population of actors in the Technology Region, and the network core members were willing to put in work for it in 2022 on a voluntary basis, it currently seems unlikely that they will be willing to take over the running of the Network themselves. After all, the core members as well as the wider set of participants in Network events, are mostly busy professionals with demanding jobs, and often families and other commitments. Similar challenges apply to the Karlsruhe-Tampere exchange. A core learning of TetRRIS is thus the importance of funding and organisational infrastructure to keep Pilot Action-like activities running over the long term.

With respect to the Practitioner Network, the strategy currently being pursued is to try to continue it (or related activities) within the scope and structures of several other innovation projects in the region that are starting now. As regards the Karlsruhe-Tampere exchange, the continuation strategy pursued at the moment is to try to continue exchange within the framework of the TRK GmbH.

Summary on the previous achievements of the TalentMagnet pillar

TalentMagnet project held its Steering Committee meeting in Nyíregyháza (Hungary) in September 2021. After a long preparation process, a 10-minute presentation about RRI has been included in the official agenda of the meeting, and Emad had the opportunity to present the basics of RRI on 15th September 2021 for the TalentMagnet partnership (see below the agenda, highlighted the presentation from 10.20). The material of the presentation has been developed together with the Szeged Team, and Miklós Lukovics took part in the TetRRIs Q&A session, which was surprisingly very active. This was the very first time they had the opportunity to be informed about RRI issues.

Furthermore, an online RRI Training for TalentMagnet staff has been successfully organized online on 18th February 2022. During the 1,5-hour training, we had 18-22 participants. The preparation took 3 month long, since we had to develop many "ingredients" before the meeting, but the most time-consuming part of the preparation was the development of the key invitation message and the development of the training material. Yaghma prepared the first version of the training material, but – based on the experiences of the Szeged Team – it has been modified many times to be easy-to-understand for non-RRI expert participants. We had to take into consideration that most of the participants have never heard before about RRI, so we had to be interesting and useful. The most important criteria were to give something to the participants which they can use during their work as soon as possible. As a first step, the agenda has been developed. As a methodology, interactiveness has been chosen highlighting some special issues of the post-socialist countries. For this reason, an external speaker has also been invited, namely Nikoletta Nadas, who works at the University of Szeged investigating RRI issues. Furthermore, as the structure of the training we decided the following schedule: first we ask some interactive questions from the participants, then – after finishing a logical unit – Emad talks about the RRI issues of the finished logical unit.

In addition, RRI visuals have been designed to visualize the most important messages of RRI, which have been integrated in planning the workshops.

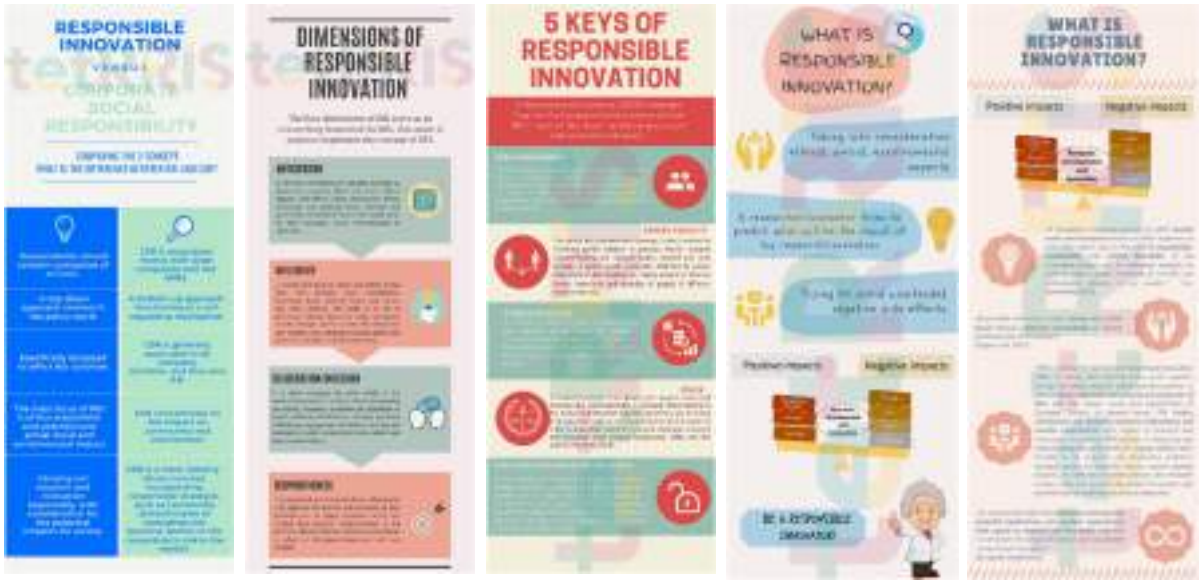


Figure 55 RRI Visuals

Design and set up the pilot action

For selected talents we organize RRI educational workshop series. Following the recommendation of Mika Nieminen, we create **real life case study** for students and let them solve individually and in groups, using RRI framework. The topic of the real-life case study will be in line with one of the most important topics of the European Union, the EU Green Deal: The Carbon Capture and Utilization (CCU). An external CCU expert will be invited to talk about CCU to understand the real-life problem which should be addressed with the RRI framework.

Using the favourite RRI tool of the Szeged Team, Erik Fisher's STIR, we focus on talents in **social and technical sciences**. More concretely, we work with students of the University of Szeged Faculty of Economics and Business Administration and Faculty of Sciences, more specifically with chemists, since they are familiar with the CCU topic. Economist students get theoretical and practical RRI education to clearly understand what RRI is and be apple to apply it in the practice of CCU. This would be 2 theoretical lectures and 2 seminars. One of them would be in English, made by Emad online. Chemist students have 1 theoretical lecture and 1 seminar.

Previously, the RRI training (February 2022) has been successfully held for 18 TalentMagnet staff members. During the training they seemed to be interested, but in contrary, they didn't fill-in the questionnaire after the training. Based on that, TalentMagnet Szeged Staff and TetRRIs Szeged staff consulted the opportunities, and the idea was that the TalentMagnet-TetRRIs cooperation should be extended to the main target group of the TalentMagnet Project: the local talents.

Pilot objectives pursued

As stated in the mapping report (D2.2), one of the main RRI-related problems in the region is the lack of knowledge and interest regarding the RI/RRI concept. The results showed that parts of the innovation sector have some rudimentary awareness of the concept (more than half of the interviewees have heard about the concept) but does not have accurate knowledge about the elements, involved responsibility dimensions and benefits of RRI. The participants focus on some emphasised responsibility dimensions during the innovation process, but do not have a comprehensive approach to handle the embedded risks and negative effects of innovation. Based on this starting issue, the main objective of the pilot was to:

- wake-up interest of RRI
- build understanding and accurate knowledge of RRI
- gain practical experience on RRI

To address all of these, we defined a workshop series for talents, in which an RRI training will be followed by a real-life problem solving using RRI framework.

The workshop schedule by date:

27/10/2022 – 1st workshop for Chemist talents

31/10/2022 – 1st workshop for Economist talents with Emad Yaghmaei's RRI keynote

03/11/2022 – 2nd workshop for Chemist talents

14/11/2022 – 2nd workshop for Economist talents with Krisztina Kádár's CCU keynote

21/11/2022 – 3rd workshop for Economist talents: RRI and CCU debate day1

28/11/2022 – 4th workshop for Economist talents: RRI and CCU debate day2

Table 14 Basic data from participants

PARTICIPANTS	STAKEHOLDER[7]	ORGNIZATION	REGION	GENDER	RELEVANCE[8]
35	Academia	Greennovation Center	Szeged	18 Females/17 Males	++

During the TalentMagnet Workshop series we had altogether 35 participants as follows:

- 25 chemist talents
- 10 economist talents
- 2 external experts of carbon capture and utilization (CCU) who presented the real life case study
- 1 PhD student from the Doctoral School of Economics is working on an RRI-related thesis

There was no drop-out during the workshop series. The number of economist talent participants was 10 during all the 4 workshops. The number of chemist talent participants increased by 1 student at the second workshop – she was sick during the first one.

After having trained the staff of the TalentMagnet project in February 2022, now we focused on brand new target group: the talents. However, staff members showed interest during the RRI training, after that they didn't reflect the questionnaires and the opportunity of bilateral consultations in the topic.

So, our idea was to concentrate directly on talents with the aim of providing them an RRI-magnet.

Following Erik Fisher's STIR (socio-technical integration research) logic, we involved economist as socio, and chemist as technical students to our project.

To fulfil the requirements of a real-life case study, an expert of carbon capture and utilization was involved to present the starting challenge of the case study. Furthermore, a PhD-student was invited, who is working on a thesis in RRI.

All the involvements have been carried out using personal contacts.

[7] Please select: Academia/research, innovation/business, Public administration/policy maker, CSO/lay person/association, Other.

[8] Relevance to lab activities where ++ is highly relevant, + means relevant and – low relevant

1. Implementation of Workshops

We count the preparation period after the decision to work with talents directly. The preparation before the workshop series took quite long because we wanted to integrate all the previous experiences concerning RRI from the past 7 years (the year of the first STIR study in Hungary). The main steps of the preparation were as follows:

1. We started preparation in the middle of the summer with defining the characteristics of the talents we want to involve.
2. Defining the structure of the workshop series
3. Defining the topic of the real-life case study
4. Define the dates of the workshops.
5. Finding an inviting an expert of the real-life case study to present the baseline challenge.
6. Finding the way to the defined talents
7. Inviting talents with the pre-defined characteristics to the workshop series
8. Setting-up the presentations for the chemist talents
9. Working out the methodology of talent involvement (see in Appendix1)
10. Working out the questions of the interactive questions
11. Creating slido.com workplace for interactive questions
12. Working out questionnaires for the evaluation of the workshops (follow-up)

27/10/2022 – 1st workshop for Chemist talents (2/1)




After a long preparation time, the first workshop of the TalentMagnet Workshop Series has been organized for chemist talents. The venue was a lecture room of the University of Szeged, Faculty of Sciences and Informatics. Actually, the room itself was very inconvenient from a workshop point of view, since it was quite large (for approximatelly 150-200 people) and has been constructed in a sloping structure. As a consequence of it, the room with 25 talents looked like an empty room and the talents were sitting far from the moderator. So our aim was to ask for an other room for the next workshop.
The workshop has been started with a short introduction, and orientation: talents have been informed about the structure of the two workshops, about the topics which will be discussed and about the methodology: the first workshop will be mainly a preseantation with Q&A session, the second workshop will be a shorter presentation and longer discussion.

As a first step, talents have been asked about their knowledge on Responsible Research and Innovation (or at least some parts of it). The results of this small survey underlined

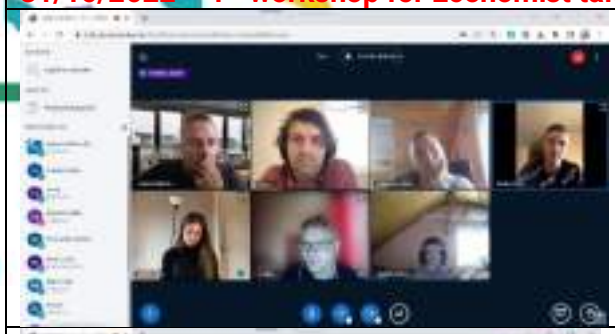
the statements of Deliverable 3.1 and 3.2 that the knowledge and awareness about RRI related topics is extremely low in the Hungarian innovation environment, which is also valid for the participants of the workshop.

During the presentation, the following topics have been presented for the talents:

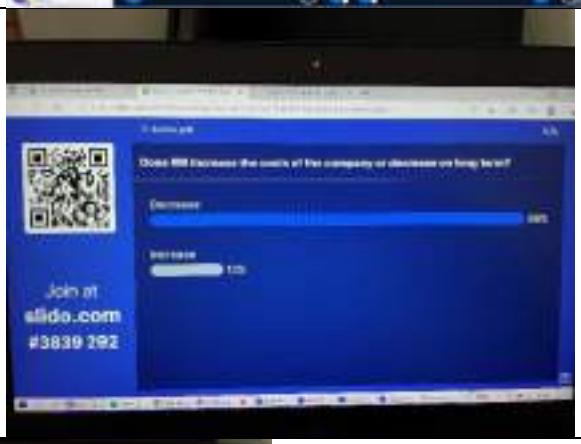
1. background of Responsible Research and Innovation
2. importance of Responsible Research and Innovation
3. definition of RRI
4. elements of RRI
5. RRI in the European Union
6. Keys
7. Dimensions

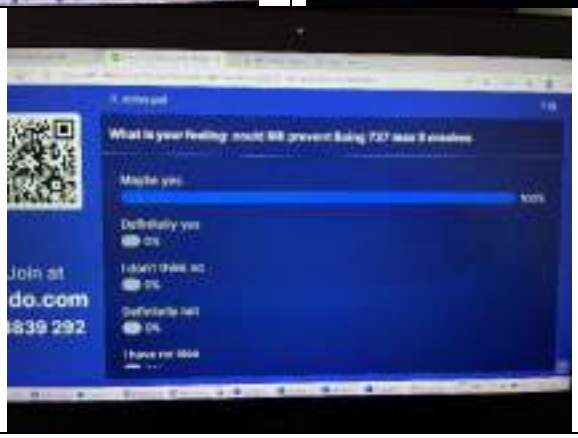
The TetRRIs visuals have also been introduced for them.
After the presentation, Q&A session opened. 2 talents asked questions: one of them asked to give more concrete examples about not expected negative side effects of the innovation, the other mone asked about clarification of the ethical dimension of the RRI and its possible implementation in the chemistry. Both of the questions have been discussed.

31/10/2022 – 1st workshop for Economist talents (4/1)









Some days after the first workshop held for chemist talents, the first workshop for economist talents has been organized. The main logic of the framework is the following: i) as a first step, talents will be trained on the framework of responsible research and innovation, then – based on the main logic of the workshop about dealing with real life problems ii) talents will be informed about the main issues of CO2 in the world and the innovations concerning carbon capture and utilization (CCU), which will be the basis of their problem solving work. Then – after preparation – iii)-iv) problem solving debate workshops will follow, in which hopefully talents will apply RRI-framework.

During the first economist workshop, the aim was to make talents clear the framework of RRI. To do so, they have been invited to listen an internationally well-known expert in English, which is usually very attractive for talents.

The venue was the online platform of the University of Szeged, and the invited speaker was Emad Yaghmaei, expert of the TetRRIs project and the Delft University with his presentation titled "Responsible Research and Innovation (RRI) supports industry: Assessing and improving social performances in R&I projects". During this workshop, alltogether 14 participants worked together.

The special feature of the workshop was that it has only been realized some days before the workshop that the scheduled date (31st October) is not workday in Hungary. After realizing this issue, registered talents have been contacted and asked about their preferences concerning finding a new date or keeping the original date despite it is not a working day. Surprisingly, 100% of the talents choosed to have the workshop in the original date, which is a very important indirect indicator of their interest, since they were happy to take part in the workshop in their free time, too.

Before Emad Yaghmaei joined the workshop, it has been started with a short introduction, and orientation in Hungarian: talents have been informed about the structure of the four workshops, about the topics which will be discussed and about the methodology.

As a first step – still in Hungarian –, talents have been asked about their knowledge on Responsible Research and Innovation (or at least some parts of it). The results of this small survey underlined the statements of Deliverable 3.1 and 3.2 that the knowledge and awareness about RRI related topics is extremely low in the Hungarian innovation environment, which is also valid for the participants of the economist talent workshop, too.

Then, after Emad Yaghmaei joined the workshop, the language changed to English. During the presentation, the following topics have been presented for the talents:

1. challenges tackled by RRI
2. Governance for sustainability - RRIdefinition of RRI
3. Societies demand more democracy in science and more science in democracy
4. Specific key issues and process dimensions
5. Steps to improve social performances in R&I projects
6. RRI Roadmap

After the presentation, Q&A session opened. 1 talent asked 1 questions, which has been answered by Emad.

03/11/2022 – 2nd workshop for Chemist talents (2/2)




The second workshop of the TalentMagnet Workshop Series has been organized for chemist talents one week after the first workshop for the chemist talents. However, we asked for a new room for the workshop, unfortunatelly we cound't manage this issue successfully because all the other rooms were full and we didn't find anyone willing to change the room. So the venue was again the same lecture room of the University of Szeged, Faculty of Sciences and Informatics. So the room itself was very inconvenient from a workshop point of view again, since it was quite large (for approximatelly 150-200 people) and has been constructed in a sloping structure. As a consequence of it, the room with 25 talents looked like an empty room and the talents were sitting far from the moderator.

The workshop has been started with a short discussion about the previous workshop: we asked helping questions to the talents to summarize the knowledge of the first workshop. From that we could state that they understood clearly the importance of RRI, more or less they could define RRI from they own (using their own words), and they could argue among the importance of RRI. They also could give some examples on keys and dimensions, but at this point they needed more explanaitons and clarifications.

After that, the second part of presentation followed with the following topics about the practical implementation of RRI:

1. Short presenation of some selected tools, like Living Lab, Constructive Technology Assessment (CTA), Imagine RRI,
2. Longer presentation of Socio-Technical Integration Research, STIR, it's meghodology, progress etc.

After the presentation, Q&A session opened. This time, we had 1 question about the STIR decision protocoll and it has been answered. Then, a discussion followed, where we started to STIR the talents on their favourite chemist topic they already learnt. We wanted to highlight the importance

of alternatives in the decision protocoll and on the importance of thinking about not intented negative side effects of the innovation activity. At the beginning, they find it very challenging and difficult to name other alternatives to any kind of concrete research activities, but at the end they understood its importance. The same happened with possible negative side effects as we asked them to say what kinf of dangerous things could happen if someone would use their research results with bad purpose. At the beginning they said that their results can not harm humanity at all, but after discussing some questions they understood the potential dangers, too.
At the end, questionnaires have been filled in. The English version of the questionnaire is in Appendix.

13/11/2022 – 2nd workshop for Economist talents (4/2)



However, the second workshop was scheduled to meet in-person, 2 talents reported mild symptoms of sickness but expressed their interest to join the workshop online. Since they aim to be successful on the debate day, they claimed that information about CCU is extremely important for them for the preparation.
The venue was the online platform of the University of Szeged, and the invited speaker was Emad Yaghmaei, expert of the TetRRIs project and the Delft University with his presentation titled "Responsible Research and Innovation (RRI) supports industry: Assessing and improving social performances in R&I projects". During this workshop, alltogether 14 participants worked together.
Since the main concept of the workshop series for economist talents is to solve problems from the real life, the second workshop was planned to get all the knowledge about the technology of the selected topic. Thus, an expert has been invited, who works with carbon capture and

utilization technologies, and she was asked to give a talk in which she talks about advantages and disatvantages, uncertainities, social inclusion and ethical aspect of the technologies without using this wording.
This was a very important approach, since we want to check wether talents are able to bound together these issues with the “solutions” Emad Yaghmaei mentioned last time. The structure of the presentation was as follows:

1. Current status and problems with the high level of CO2 globally
2. Technologies for carbon capture
3. Technologies for carbon storage
4. Technologies for carbon utilization
5. Value chain of CCU

After this, a discussion followed, where partners asked more background information about CCU in order to prepare the debate. Furthermore, they asked about the methodology of the debate (Appendix 5.1) and about some clarification about it.

21/11/2022 – 3rd workshop for Economist talents (4/3)




The third workshop of the workshop series targeted to economist talens was the “big day”, the day of the debate. The aim of the debate is to solve a real life challenge, which has been identified earlier as the CO2 issue of the globe. The given technology to address the CO2 issue is in our case the Carbon Capture and Utilization (CCU). To do so, talents have been trained in RRI issues (1st workshop), trained in CCU issues (2nd workshop), and prepared in teams to address the CO2 issue.

The venue was a workshop room of the University of Szeged, which was really optimal to carry out a debate. Talents have been seated in 2 groups. Two teams of 5 talents participated in the debate. One team was the "pro" team, who argue in favour of the given statement (CCU technologies are the best way to address CO2 issues), while the other was the "contra" team, whose members tried to prove that the given statement is not true.

Following a strict methodology (Appendix 5.1) – which has been published for them – they expressed opinions on a given current innovation topic, highlighting the RRI issues of a real life case studies indirectly, within a structured framework.

Teams collected pros and cons concerning the topic, and they bounded them to the theoretical background of RRI presented by Emad Yaghmaei. Since we wanted to monitor their openness to apply the RRI framework as a possible solution to the collected negative side-effects of the innovation, we did not ask them directly to do so.

The debate started by the first person of the pro team, followed by the first person of the contra team. In the second round, the second person of the pro team speaked, followed by the second person of the contra team. In the third round, the third person of the pro team speaked, followed by the third person of the contra team. In the last round, the fourth person of the pro team and then the fourth person of the contra team could state their arguments. It is important that every *n*th speaker had to respond to the arguments of the previous person, so it means that we did not accept pre-learned texts that do not match with what was said previously! It was also important to always listen to everyone and not interrupt each other.

After each talk, there was a 1-minute break, during which the debating teams can consult on the strategy for the next talk taking into consideration what has been said. This was a change to the previously published methodology, since talents asked to have opportunity to discuss not only after a round (2 talks) but after one talk.

Actually, involving RRI topics into the arguments appeared during the debate but only in a very low level. They only could mention and argue the uncertainty of the CCU technologies.

After the debate we organized a spontaneous discussion where talents were asked about theirs strategy. They mentioned that the planned to focus on the second day and they didn’t mention

everything they know and they want to mention next week. But all of them felt the debate very comfortable and they highlighted that they learnt a lot.

28/11/2022 – 4th workshop for Economist talents (4/4)




The second “big day”, the reverse debate day was the fourth (and last) workshop targeted to economist talents. The aim of the debate is still to solve a real life challenge, which has been identified earlier as the CO2 issue of the globe. The given technology to address the CO2 issue is in our case the Carbon Capture and Utilization (CCU). To do so, talents have been trained in RRI issues (1st workshop), trained in CCU issues (2nd workshop), and hold the first debate day (3rd workshop).

The special feature of the reverse debate day was, that the roles of the teams were reversed: those who have argued in favor of the statement last week, must argue against the statement on the reverse debate day, while those who have argued against the statement must argue in favor of the statement on the reverse debate day. Doing it in such a way that the arguments and counterarguments presented on the first day of the debate must not be mentioned!

The venue was a workshop room of the University of Szeged, which was really optimal to carry out a debate. Talents have been seated in 2 groups. Two teams of 5 talents participated in the debate. One team was the "pro" team (last weeks “contra” team), who argue in favour of the given statement (CCU technologies are the best way to address CO2 issues), while the other was the "contra" team (last weeks “pro” team), whose members tried to prove that the given statement is not true.

Following a strict methodology (Appendix 5.1) – which has been published for them – they expressed opinions on a given current innovation topic, highlighting the RRI issues of a real life case studies indirectly, within a structured framework.

Two CCU experts, Krisztina Kádár and Zsófia Kószó were invited to the workshop in order to give professional control to the arguments.
The quality of the arguments increased significantly since the last week: talents collected more and more facts, they showed figures to the opponent team underlining their statements, reacted professionally on the statements of the opponent teams by using google during the 1 minute discussion time. They worked as a professional team, and used interactive techniques.
It should be highlighted, that almost all speakers used RRI in his/her argument, which can be evaluated as a big success of the workshop series. Most of them argued with the uncertainty and the possible not expected side-effects of the CCU technologies or alternative technologies presented by the "contra" team. Public engagement and social inclusion has been also debated by the teams discussing also the amount of available info about CCU and alternative technologies for the general public.
Maybe the most intense debate came when the "contra" team argued that instead of capturing and utilizing CO2 the solution would be not to produce CO2 at al – and for this they proposed to use nuclear and fusion energy plants – as green energy resources. They also underlined with facts that those solutions are zero emission solutions, which could solve CO2 issues coming from the energy sector. At this point both teams argued using the RRI framework: pro team argued using social inclusion, public engagement, uncertainty and mostly with safety issues mentioning also the concrete example of the nuclear power plant in Zaporizia, Ukraine. The contra team argued using RRI as a virtual shield in terms of nuclear power is extremely sensitive, so all components of RRI must be taken into consideration in each step of the innovation and also in regulation.
The "contra" team also mentioned CTA, the contstructive technology assesment – as a method of RRI, which has been found by them without mentioning it by the mentors before.
After the debate they have been surveyed and as a result of that it can be stated that they understood RRI with the concrete real life example. It is also important that they decided to use RRI framework in their arguments – without pressioning them to do so. Furthermore, they highlighted that they learnt a lot from the workshop series, first of all in practicing the theory and using it in real life settings. They also felt entertaining the last workshop, the atmosphere was really good with happy and smiling faces and at some points with laughing.

Follow-up and challenges identified

At this point we must introduce the follow-up of the two groups (chemist talents and economist talents) separately, since they differ significantly from the follow-up point of view:

1. Chemist talents didn't request any kind of follow-up meeting or workshop (but their teacher asked to come back next year and talk about RRI to the group of next year)
2. Economist talents requested a potential follow-up meeting in February 2023, after their examination period.

The difference between the success of the Workshops can not only be recognized in terms of follow-up requests but also in the intensity of brainstorming and using RRI in the discussions. In case of Chemist talents, the group was larger, and the room was big, so we couldn't manage deep interaction and brain storming. In contrary, economist talent workshops have been run with 10

talents in a small room, where they could discuss together all the issues they wanted to address in a good atmosphere.

2. Workshop Roadmap Reflection

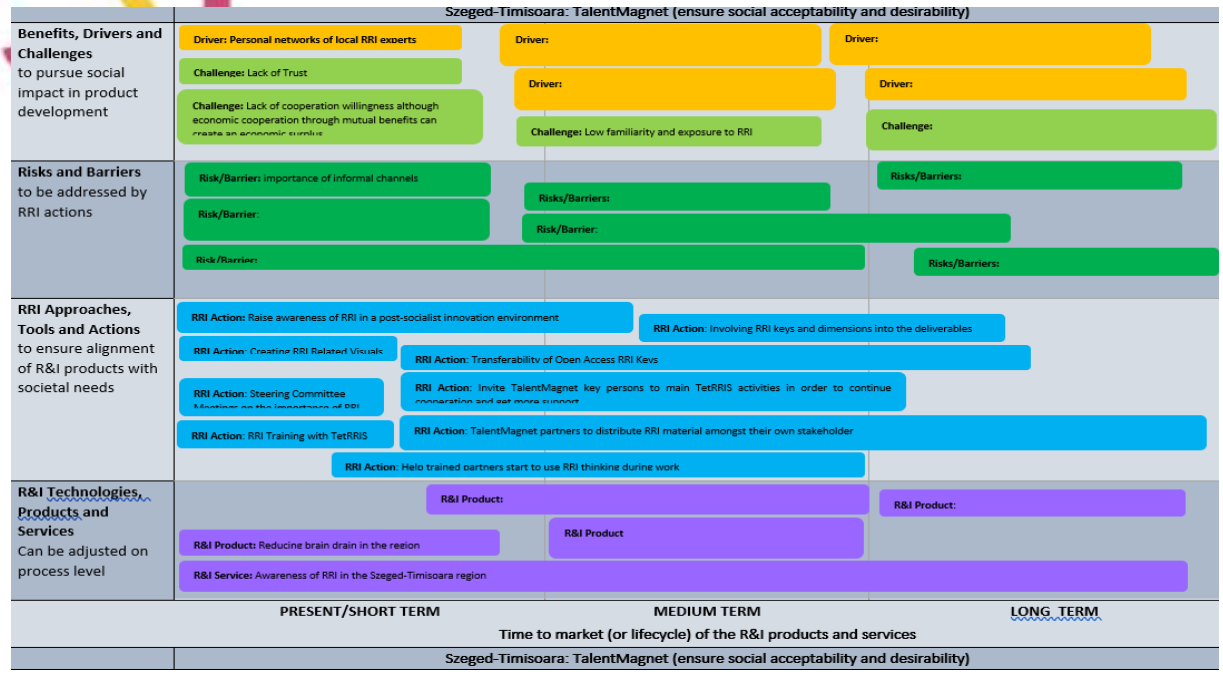


Figure 56 TalentMagnet's roadmap

As written in D3.1 and D3.2, when discussing RRI in the region, the project should consider the regions post-socialist heritage, along with its socio-cultural factors, as written in the Mapping Report. As a recap, these include:

1. Lack of trust
2. Lack of cooperation willingness
3. Importance of informal channels
4. Low familiarity and exposure to RRI

Based on this, the starting challenge is raising RRI awareness in a post-socialist innovation environment. As identified, in D3.1 and 3.2, Hungarian researchers and other actors in the innovation process have mostly had minimal exposure to RRI and are unfamiliar with the concept. Diffusion of RRI and related ideas is also hindered by the low levels of societal trust and general climate of "suspiciousness" of cooperative endeavours noted above: Because the default assumption for many people remains that humans are fundamentally selfish and economic and ostensibly cooperative activities are ultimately zero-sum, a concept aimed at securing a "greater good" like RRI tends to evoke scepticism and is often met with disinterest.

To address this, we organized RRI educational workshop series for selected talents. Following the recommendation of Mika Nieminen, we created real life case study for talents and let them solve individually and in groups, using RRI framework. The topic of the real-life case study was in line with one of the most important topics of the European Union, the EU Green Deal: the Carbon Capture and

Utilization (CCU). An external CCU expert was invited to talk about CCU in order to understand the real-life problem which should be addressed with the RRI framework.

Was this Challenge/Driver/Risk/Barrier resolved prior to the Workshop?

NO

Was this Challenge/Driver/Risk/Barrier resolved during the Workshop?

For the participants definitely YES

Can this Challenge/Driver/Risk/Barrier be resolved following the Workshop/during the duration of TetRRIS?

Hopefully YES, depending on the spill-over willingness of the participants.

The workshop series validated a methodology on effectively raising awareness of responsible research and innovation approach for the regional talents. It proved that after a short training on basic definitions and after understanding a concrete real-life problem they are able to solve the issue using RRI framework.

3. Reflection Survey

In order to evaluate the added value of RRI for TalentMagnet within TetRRIs project, a reflection survey with 15 questions around RRI implementation at current stage for each region was developed in order to be reflected at the middle of pilot actions (work package 4) and at the end of the project (work package 6).

Figure 57 Reflection Survey TalentMagnet

4. Evaluation

How do you rate presentations at the event? (1 very low -5 very high)

5

How do you rate participatory dynamics at place? (1 very low -5 very high)

5

5. Conclusion

Through the workshops in the last months, diverse perspectives on different aspects of citizen participation and RRI experiences were exchanged. As a result, the actors have found the activities useful and constructive, given the knowledge transfer (via presentations) and the interactive networking activities (discussion rounds).

VI Szeged-Timisoara | DIH-World: Generic information

1 Introduction of how the pilot action was designed and set up.

DIH-World has been included in TetRRIS as "learning pilot" which meant that the expert team of DIH-World shall participate at ALL activities of the TetRRIS project. On the other hand, it is also an "experimental policy pilot" because it aims to bring together regional stakeholders in a particular local context where sectorial policies on national level (i.e. cluster development policy, urban development policy, etc.) are NOT based on widespread consultations with relevant stakeholders. Consequently, it is not only difficult to raise interest for RRI among the companies and other potential partners but the overall lack of interest for professional policy making actions shall be tackled with the TetRRIS project.

Nevertheless, the expert team of DIH-World project have successfully created partnership with the Territorial Innovation Platforms (TIP) in Szeged and in Kecskemét where TIPs have the role of "local ecosystem coordinator" of the S3 institutional framework in Hungary. The development actions that were initiated by the activities of TetRRIS project in Szeged shall therefore be continued by DARINNO together with the TIP in Szeged.

The registered members of the TIP in Szeged were the primary group of stakeholders who were involved in TetRRIS activities. More specifically, the regional foresight workshop that DARINNO organised and implemented together with experts from Tampere has been acknowledged as "official event" of the TIP in Szeged by the National Office for Research, Development and Innovation of Hungary. Consequently, DIH-World pilot has reached significant impact on national policy making with regional focus.

2. Pilot objectives pursued and how they were addressed

The primary focus of the DIH-World pilot is on providing support for SMEs on regional level by implementing "Digital Innovation Hub" function in Szeged. Consequently, this objective was supported by activities of the different TetRRIS partners as described in detail in Section 1.
The primary output of DIH-World project is the Business Plan for the new Digital Innovation Hub function in Szeged and TetRRIS has provided significant contribution to that. The new "responsibility accelerator" function shall not only be an important part of the DIH-World Business Plan but it also pursued institutional partnership with the local university in Szeged and also with the European research facility for advanced photonics which is a prominent actor within the local innovation ecosystem.

3. Reflection Survey

To evaluate the added value of RRI for DIH-world within TetRRIs project, a reflection survey with 15 questions around RRI implementation at current stage for each region was developed to be reflected at the middle of pilot actions (work package 4) and at the end of the project (work package 6).

RRI dimension	Item	RRI key performance indicators	Select	Score
RRI Awareness	1	Awareness of public and social values		
	2	Awareness of ethical issues raised by the pilot's innovations		
	3	Awareness of stakeholder views		
RRI implementation	4	Stakeholder engagement (inclusion) - external stakeholders and third party networks (e.g. CSOs)		
	5	Employee engagement level in the pilot		
	6	(Responsiveness) does the pilot respond to (new) societal demands and developments? - Capacity to align to societal goals		
	7	(Reflexivity) does the pilot mention public and social values in its innovations?		
	8	(Anticipation) does the pilot (actively) anticipate social effects of its innovations?		
	9	Transparency and accountability about RRI-relevant choices: is the pilot transparent about it RRI-relevant choices?		
	10	Diversity and gender equality		
	11	Does the pilot learn mechanisms to address public and social values in service and product development?		
RRI Assessment	12	Risk identification and risk management		
	13	Impact assessment	does the pilot assess the environmental, social, governmental, ethical, and legal impacts of its innovations?	
	14	Technology assessment (TA)		
	15	Is the pilot monitoring its RRI efforts and the consequences of these?		

Figure 58 Reflection Survey DIH-world

4. Conclusion

Cooperation has been particularly active between Tampere and Szeged-Timisoara regions because the TetRRIS workshop on regional foresight was organised by VTT and DARINNO on the 8th of December 2023. One outcome of it was the “responsibility accelerator” function which has already been tested as experimental service by VTT in 2022 and therefore DARINNO can build the implementation of this function in Szeged based on the experience of it by VTT.

Involvement of the stakeholders from Timisoara in the implementation of the responsibility accelerator function was also discussed with VTT at the foresight workshop in December, the interest of the Romanian partners was confirmed and joint implementation of the responsibility accelerator as cross-border sustainability action for companies was agreed upon. The cross-border operations are modelled on the example of Karlsruhe Technology Region because of joint Karlsruhe-Szeged-Timisoara joint online workshops during 2022.

The TetRRIS Lab by Cantabria has also been a good example for the Szeged-Timisoara region thanks to the workshop in Santander which has been followed online by good number of interested stakeholders both from Hungary and from Romania. The TetRRIS project therefore brought knowledge and practical examples to the regional stakeholders in the Szeged-Timisoara region and therefore it can be considered a practical outcome of the knowledge transfer activities by a transnational cooperation project.

VII. Overall Conclusion

Overall, as the project reaches its end, it can be noted that one of the biggest challenges that all regions face is that RRI as a concept is not strongly present, while many of its elements have become widely acknowledged and integrated in both policies and business. However, through the pilot actions developed, responsibility is continuously getting more important in policies and businesses in the studied regions.

By translating RRI into concrete actions and dimensions more familiar to the stakehiolders the adoption of the practical know-how and experience in implementing sustainability and responsibility strategies was enforced. Thus, considerable progress in the regions has taken place thanks to the initiatives of the project.

Cooperation between the different regions, such as Tampere and Szeged-Timisoara led to knowledge transfer and learning of practices from one to another that had already been tested as experimental services and that can later be implemented. The pilot actions through the TetRRIS project brought knowledge and practical examples to the regional stakeholders and therefore it can be considered a practical outcome of the knowledge transfer activities by a transnational cooperation project. Moreover, through the various workshops, diverse perspectives on different aspects of citizen participation and RRI experiences were exchanged.

Overall, the engaged regions perceived the actions in work package 4, a useful tool to promote RRI in their regions and enhance multi-stakeholder engagement processes.

VIII. ANNEX

Appendix1 TalentMagnet

The methodology of debate for the talents of Economics

***The aim of the debate**: Expressing opinions on a given current innovation topic, highlighting the RRI issues of a real-life case studies indirectly, within a structured framework. The debate provides an opportunity to approach a given topic from two different perspectives, where participants can express their opinions from two competing points of view, with the purpose of contradicting the reasons of each other, and convincing the other team.*

***The participants of the debate**: Two teams of 4 people participate in a debate. One team is the "pro" team, who argue in favour of the given statement, while the other is the "contra" team, whose members try to prove that the given statement is not true.*

***Topic of the debate:** GHG emissions-related innovations, CO2 capture and utilization.*

***RRI issues during the debate**: Teams will collect pros and cons concerning the selected innovation topic, and according to our expectation they will bound them to the theoretical background of RRI presented by Emad. Since we want to monitor their openness to apply the RRI framework as a possible solution to the collected negative side-effects of the innovation, we will not ask them directly to do so.*

***Preparing for the debate**: During the preparation for the debate, literature sources must be processed by students, as well as the opinions of experts on the topic, and students need to clearly refer to them during the debate. During the discussion, we ask for accurate data (maybe graphs, tables, quotes, etc.)! In order for the teams to be able to respond to the reasons of the other team, it is worth considering in advance what counterarguments can be raised to each of our reasons. So it is worth preparing from the other team's point of view.*

***The course of the discussion**:*
The debate will happen in two rounds:

1. *Debate day: each team argues according to the roles drawn previously at the seminar*
2. *Reverse debate day: the roles of the teams are reversed: those who have argued in favor of the statement must argue against the statement on the reverse debate day, while those who have argued against the statement must argue in favor of the statement on the reverse debate day. Doing it in such a way that the arguments and counterarguments presented on the first day of the debate must not be mentioned!*

The debate is always started by the first person of the pro team, followed by the first person of the contra team. In the second round, the second person of the pro team speaks, followed by the second person of the contra team. In the third round, the third person of the pro team speaks, followed by the third person of the contra team. In the last round, the fourth person of the pro

team and then the fourth person of the contra team can state their arguments. It is important that every nth speaker has to respond to the arguments of the previous person, so it means that we do not accept pre-learned texts that do not match with what was said previously! It is also important to always listen to everyone and not interrupt each other.
It is important to note that a debate is not synonymous with a fight, therefore the aim is to respect each other's opinions and refute them professionally - in a polite manner.
After each round, there is a 2-minute break, during which the debating teams can consult on the strategy for the next rounds taking into consideration what has been said. During the same break, the students who are not debating at the moment evaluate individually what was said in the previous round of the debate.

RRI roundtable
At the end of the debate, we will make a roundtable to discuss how RRI could help to solve the problems raised related to the selected innovation and try to put together these issues with the theory and tools of RRI.

Implementation:

<table>
<tr><td>First person of the pro team: Presents the statement that will be discussed. The first person introduces the team members and the division of labor. He/she presents the main concepts of the statement (it may happen that the two teams interpret the basic concepts differently). The next is the team's motto, which briefly (in one sentence) summarizes the team's point of view. After that, he/she presents the arguments in favor of the given statement (1-2 arguments). It is worth starting with the strongest ones. Time available: 6 minutes</td><td></td></tr>
<tr><td></td><td>First person of the contra team: The first person introduces the team members and the division of labor. He/she presents the main concepts of the statement (it may happen that the two teams interpret the basic concepts differently). The next is the team's motto, which briefly (in one sentence) summarizes the team's point of view. Before presenting the arguments, he/she reacts to the arguments of the other team. After that, he/she explains the counterarguments (1-2 counterarguments). It is worth starting with the strongest ones. Time available: 6 minutes</td></tr>
<tr><td colspan="2">2-minute break
– The two debating teams can consult on the further strategy (the platform for this is the responsibility of the team).
– The members of the two non-debating teams individually evaluate the previous round of the debate on an online sheet.</td></tr>
<tr><td>Second person of the pro team: Reacts to the arguments of the contra team's first person, and</td><td></td></tr>
</table>

then presents new arguments. ***Time available: 3 minutes***	
	Second person of the contra team: *Reacts to the arguments of the pro team's second person, and then presents new arguments.* ***Time available: 3 minutes***
2-minute break – *The two debating teams can consult on the further strategy (the platform for this is the responsibility of the team).* – *The members of the two non-debating teams individually evaluate the previous round of the debate on an online sheet.*	
Third person of the pro team: *Reacts to the arguments of the contra team's second person, and then presents new arguments.* ***Time available: 3 minutes***	
	Third person of the contra team: *Reacts to the arguments of the pro team's third person, and then presents new arguments.* ***Time available: 3 minutes***
2-minute break – *The two debating teams can consult on the further strategy (the platform for this is the responsibility of the team).* – *The members of the two non-debating teams individually evaluate the previous round of the debate on an online sheet.*	
Fourth person of the pro team: *He/she reacts to the arguments of the third person of the contra team. New arguments cannot be presented. This person's job is to summarize his/her team's arguments. Since he/she is the last speaker of the team, it is important to be convincing.* ***Time available: 3 minutes***	
	Fourth person of the contra team: *He/she reacts to the arguments of the fourth person of the pro team. New arguments cannot be presented. This person's job is to summarize his/her team's arguments. Since he/she is the last speaker of the team, it is important to be convincing.* ***Time available: 3 minutes***
2-minute break – *The members of the two non-debating teams individually evaluate the previous round of the debate on an online sheet.*	

Appendix2 TalentMagnet

The questionnaire of the chemist talents

QUESTIONNAIRE

1. What does innovation mean in your understanding?

2. What does research and development mean in your understanding?

3. As a student of the Faculty of Natural Sciences, how important do you think it is to acquire knowledge in social sciences during your studies?
Not important at all 1 – 2 – 3 – 4 – 5 – 6 Very important

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

5. How many of the courses available at your faculty's programme have social science aspects?
Based on your previous studies, mark the most typical statement with an x.
There is absolutely no such course, and there is no need for it
There is absolutely no such course, but it would be nice to have
There are maximum 2 such courses per year, but there is no need for them either
There are maximum 2 such courses per year, and that is enough
There are maximum 2 such courses per year, but it would be better to have more
There are at least 3 such courses per year, but there should be fewer
There are at least 3 such courses per year, and that is just fine
There are at least 3 such courses per year, but it would be better to have more
Name all courses that cover(ed) social science aspects as well:
(If nothing comes to your mind suddenly, feel free to leave it blank)

6. In your opinion, how compatible is it to involve social scientists in natural science researches?

There is no point 1 – 2 – 3 – 4 – 5 – 6 Very important

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

7. How important do you think it is to consider environmental aspects in natural science research-development-innovation processes?
Not important at all 1 – 2 – 3 – 4 – 5 – 6 Very important

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

8. How important do you think it is to consider social aspects in natural science research-development-innovation processes?
Not important at all 1 – 2 – 3 – 4 – 5 – 6 Very important

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

9. How important do you think it is to consider economic aspects in natural science research-development-innovation processes?
Not important at all 1 – 2 – 3 – 4 – 5 – 6 Very important

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

10. How important do you think it is to consider ethical aspects in natural science research-development-innovation processes?
Not important at all 1 – 2 – 3 – 4 – 5 – 6 Very important

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

11. In your opinion, to what extent can the consideration of social, economic, ethical and environmental aspects influence the natural science research-development-innovation processes?

Not at all 1 – 2 – 3 – 4 – 5 – 6 Total extent

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

12. In your opinion, to what extent does it make sense to integrate social, economic and ethical
issues into the process of natural science research-development and innovation?
Not at all 1 – 2 – 3 – 4 – 5 – 6 Total extent

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

13. How do you think the capabilities of a natural science research group could be improved in order to consider social, economic, environmental and ethical aspects during its research?

Not at all 1 – 2 – 3 – 4 – 5 – 6 Total extent

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

14. In your opinion, how useful can the collaboration be between natural science and social science researchers be during research work?

Not at all 1 – 2 – 3 – 4 – 5 – 6 Absolutely

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

15. In your opinion, how can be/what makes a research/innovation responsible? (If nothing comes to your
mind suddenly, feel free to leave it blank)

16. What characteristics and skills do you consider important during a research work?

17. In your opinion, what characteristics and skills can mean advantage and disadvantage for your age group during research (e.g. laboratory work) and innovation?

18. How responsible do you feel yourself?

Not at all 1 – 2 – 3 – 4 – 5 – 6 Absolutely

Because:

(If nothing comes to your mind suddenly, feel free to leave it blank)

19. What year were