RRI LEADERS

RESPONSIBLE RESEARCH AND INNOVATION IN TERRITORIES

Deliverable 2.2

Report on the RRI policy discourse in the involved territories

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REPORT ON THE RRI POLICY DISCOURSE IN THE INVOLVED TERRITORIES

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P2	UNIVERSITY OF WESTERN MACEDONIA	PANEPISTIMIO DYTIKIS MAKEDONIAS	UoWM
P3	THE DANISH BOARD OF TECHNOLOGY FOUNDATION	FONDEN TEKNOLOGIRADET	DBT
P4	THE CATALAN FOUNDATION FOR RESEARCH AND INNOVATION	FUNDACIO CATALANA PER A LA RECERCA I LA INNOVACIO	FCRi
P5	ZURICH UNIVERSITY OF APPLIED SCIENCES	ZURCHER HOCHSCHULE FUR ANGEWANDTE WISSENSCHAFTEN	ZHAW
P6	REGIONAL ASSOCIATION OF LOCAL GOVERNMENT OF WESTERN MACEDONIA	PERIFEREIAKI ENOSI DIMON DYTIKIS MAKEDONIAS	LGA-WM
P7	SOFIA DEVELOPMENT ASSOCIATION	АСОЦИАЦИЯ ЗА РАЗВИТИЕ НА СОФИЯ (ASSOTSIATSIA ZA RAZVITIE NA SOFIA)	SDA
P8	MUNICIPALITY OF THALWIL	GEMEINDE THALWIL	THA
P9	ECONOMIC DEVELOPMENT AGENCY OF SABADELL CITY COUNCIL	PROMOCIO ECONOMICA DE SABADELL	PES SL

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List of acronyms / abbreviations used in this document

AIRR principles – Anticipation, Inclusiveness, Responsiveness and Reflexivity R&D – Research and Development
ALMPs - Active Labour Market Programmes
Biocat - Institution that brings together the life sciences and healthcare innovation community in Catalonia
BPOS - Bulgarian Portal (Cloud) for Open Science
CERTH - National Centre for Research and Innovation
DAPEEP SA - Renewable Energy Sources Operator & Guarantees of Origin
DEDDIE - Hellenic Electricity Distribution Network Operator

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DRT - Demand-Responsive Training
DTSS - Digital Transformation Strategy for Sofia
EIT - European Institute of Innovation and Technology
ESDI - European Spatial Data Infrastructure
ESIF - European Structural and Investment Funds
EU – European Commission
FAIR – Findable, Accessible, Interoperable, Re-usable
FCRI - Fundació Catalana per a la Recerca i la Innovació
FP7 - 7th Framework Programme (2007-2013)
H2020 – Horizon Programme 2020
ICT – Information, Communication, Technologies
IIS - Integrated Information System
IPGVR - Integrated Plan for Urban Reconstruction and Development
IS3 - Innovation Strategy for Smart Specialisation
ISN - Investor Support Network
LURA - Land Use Repurposing Assessment
MC – Monitoring Committee for monitoring and evaluation of the innovative potential of Sofia
MDP - Municipal Development Plan
NECP - National Energy and Climate Plan
NGOs – Non-Governmental Organisations
NUTS - Nomenclature des Unités territoriales statistiques
OAED - Labour Employment Organisation
PECT - Territorial Specialisation and Competitiveness Project
PECT Vallès Industrial - Specialisation and Territorial Competitiveness Project "Vallès Industrial PES-SL - Promoció Econòmica de Sabadell
PPC - Public Power Corporation
PV - Photovoltaics
RDI – Research, Development, Innovation
RELOS3 - From Regional to Local: Successful deployment of the Smart Specialisation Strategies
GP – Gross Product
RES - Renewable Energy Sources
R&I - Research and Innovation
RIS3 Regional Innovation Strategy for smart specialisation
RIS3CAT - Strategy for the Smart Specialisation of Catalonia
ROP - Regional Operational Programme
RRI - Responsible Research and Innovation
RRI-LEADERS - Leveraging Leadership for Responsible Research and Innovation in Territories
RWM – Region of Western Macedonia
SDAM - Just Transition Development Plan of lignite areas
SeeRRI - Mapping RRI Dimensions and Sustainability into Regional Development Policies and Urban Planning Instruments
SEP - Stakeholder Engagement Plan
SM – Sofia Municipality
SMEs – Small and Medium Enterprises
STEM – Science, Technology, Engineering and Mathematics

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SYS - Sofia Youth Strategy 2017-2027
UNSDGs - Sustainable Development Goals of the United Nations
UoWM – University of Western Macedonia
WP – Work Package
ZEV - Zusammenschluss zum Eigenverbrauch

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About the project

The project "Leveraging Leadership for Responsible Research and Innovation in Territories" (RRI-LEADERS) explores the relevance of responsible research and innovation (RRI) to territorial governance in four European territories, representing different cultural and socio-economic backgrounds, different scope of territorial oversight, different institutional and decision-making infrastructures, different R&I landscapes, and different dynamics among territorial actors.

The objectives of RRI-LEADERS are:

- to facilitate the adoption of RRI principles within territorial governance;
- to promote innovative, inclusive, and responsive multi-actor approach to the development of policies on issues related to science and innovation; and
- to provide an evolutionary perspective on the future of RRI in territorial policy and governance.

The central goal of RRI-LEADERS is to elaborate future-oriented strategy and action plans, or territorial outlooks, for the future potential of RRI as a guiding framework in territorial R&I governance. Outlooks will be developed through a multi-stage co-creation process, which will mobilise quadruple-helix stakeholders, i.e., academia, policymakers, industry, and civil society, from the participating territories.

RRI-LEADERS involves four different territories: Sofia (Bulgaria), Thalwil (Switzerland), Western Macedonia (Greece) and Sabadell (Spain), representing a diverse range of opportunities and implications for responsible research and innovation (RRI), which will enable to carry out a thorough assessment of the RRI relevance to territorial governance. The involved territories will thus act as demonstrators for the potential of RRI on sub-national level. The accumulated knowledge will be used to chart a detailed outlook for the future potential of RRI as a guiding framework in territorial governance of R&I and will aim to provide an evolutionary perspective on RRI for the Horizon Europe programme.

The project adopts the dominant understanding of RRI, as defined by von Schomberg: "A transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products."[1] It diverges only slightly from this definition in that it does not promote the separation of innovators from the rest of the societal actors, and instead seeks to include societal actors as co-creators in the innovation processes, and enable leadership in the development of policies with a future outlook. In doing so, RRI-LEADERS interpretation of RRI, draws heavily on the extension of the RRI framework proposed by Stilgoe, Owen and Macnaghten, who emphasise the prospective notion of responsibility by introducing four dimensions of RRI – *anticipation, inclusiveness, responsiveness* and *reflexivity*, largely known as the AIRR dimensions.[2] RRI-LEADERS integrates these four dimensions into its methodological design and operational implementation.

[1] von Schomberg, R. (2011). "Prospects for technology assessment in a framework of responsible research and innovation". In: Dusseldorp, M., Beecroft, R. (Eds.), *Technikfolgen Abschätzen Lehren: Bildungspotenziale Transdisziplinärer*. Vs Verlag, Methoden, Wiesbaden.

[2] Stilgoe, J.; Owen, R. & Macnaghten, Ph. (2013). "Developing a framework for responsible innovation". In *Research Policy*, vol.42(9), pp.1568-1580.

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The overall implementation of RRI-LEADERS builds on the following methodology:

- *RRI Audits in the involved territories and partners*, which starts off the first stage of the co-creation approach in RRI-LEADERS. The partners will establish a clear baseline of existing practices and policy developments in the four territories that have already integrated or have the potential to integrate the RRI keys and the AIRR dimensions (anticipation, inclusiveness, reflection, and responsiveness), thus providing the grounds for mainstreaming the RRI-AIRR approach in relevant policy goals, implementation routines, and territorial (municipal/regional) strategies.
- *Delphi exploration of consensus about future orientations for RRI in the participating territories* defines another stage of the RRI-LEADERS' co-creation process. The Delphi method will be used to assess dissensus and barriers, and to develop consensus about possible and feasible future pathways for a better RRI-AIRR integration for each territory.
- The RRI-LEADERS co-creation process is not strictly linear. The next step in the process is the *Development of RRI-AIRR transformative outlooks in the participating territories.* For each participating territory a transformative outlook will be conceived, conceptualised, subjected to public scrutiny and validation through the involvement of non-organised and non-institutionalised citizens and community groups.
- A horizontal action of *Policy learning and evaluation* runs throughout the project and will integrate insights from the previous activities and will promote a shared and future-oriented vision for RRI as a territorial leadership framework.
- To communicate effectively with its target groups, and to support the diffusion and exploitation of RRI-LEADERS policy outcomes, the partners dedicate efforts to streamline all strategic *communication and dissemination activities*. RRI-LEADERS partners will develop the tools to ensure that RRI-LEADERS' results reach out to the broadest range of interested audiences both within the participating territories and to a broader policy audience across the countries involved and to the EU.

Website of RRI-LEADERS: www.rri-leaders.eu

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Executive Summary

This document represents RRI-LEADERS Project **Deliverable 2. (D2.2) Report on the RRI policy discourse in the involved territories** and provides a summary on the findings regarding the embeddedness of RRI-AIRR approach in the territorial policies of the four participating territories, with a particular focus on the chosen policy areas.

Each of the involved territories conducted a documentary analysis as well as a participatory workshop. The documentary analysis was performed on the perspective of RRI keys and AIRR dimensions and focused on existing strategies, programme plans, and other policy documents related to the chosen policy areas of each territory. The objective of the documentary analyses was to identify opportunities/areas for integration of the RRI-AIRR approach in the selected territorial policy areas. On the other hand, the aim of the participatory workshops was to explore participants' perception towards responsibility as well as to assess the relevance of RRI-AIRR approach for the territorial policies.

Each partner presented a report which included both the documentary analysis and the summary from the participatory workshop, and the UoWM proceeded to the composition of the final deliverable, which includes the four partners' reports and the concluding chapter with a synthesis of the findings, as well as conclusions on the embeddedness of RRI-AIRR approach in the four participating territories.

Summary of the results from the documentary analyses from the four participating territories:

A total of 30 strategic policy documents were assessed in the four territorial units in Bulgaria, Greece, Switzerland and Spain (Catalonia). Evaluating the embeddedness of RRI keys in these documents, the dominance of open access, public engagement and science education approaches was evident. The RRI key of open access appears very frequently in Bulgaria, Switzerland and Greece, while the public engagement appears very often in the strategic documents concerning Greece. These findings show a general compliance of public policy actors with the contemporary needs of citizens' free access to critical information. They also reflect a high degree of public commitment to implementing these policies in accordance with the principles and framework in which they were designed. On the other hand, the RRI keys of ethics and gender equality are not embedded to a large extent. This finding reveals the need for policies to delve even deeper into the parameters of ethics and science, by opening up knowledge and the scientific approach to larger sections of society. As far as AIRR principles are concerned, inclusiveness and responsiveness appear in most of the studied documents, while reflexivity was missing, raising questions regarding reassessment practices involved.

Summary of the findings from the participatory workshops from the four participating territories:

In general, it was stated that RRI-AIRR approach is considered particularly important for the policy discourse in all four territories. A general conclusion from the workshops is that most participating stakeholders know about the RRI-AIRR approach, however, its embeddedness into the existing policy-making documents lags behind. As shown in the documentary analysis, public engagement appears in most documents, although it was stated that the voice of civil society needs to be strengthened. Open access also appears in all four territories, but a lack of knowledge on the available sources is mentioned as well as a lack of data evaluation

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by citizens. Science education shows up mostly in the municipalities of Sofia and Thalwil, while gender balance mostly in Sabadell. Ethics is a key which has not been formally integrated in any of the four territories. Regarding AIRR dimensions, participants replied that they are familiar with all four dimensions, however, anticipatory governance and inclusiveness are the ones embedded to the highest degree.

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Introduction

RRI-LEADERS: Leveraging Leadership for Responsible Research and Innovation in Territories, involves four different territories: Sofia (Bulgaria), Thalwil (Switzerland), Western Macedonia (Greece) and Sabadell (Spain), representing a diverse range of opportunities and implications for responsible research and innovation (RRI), which will enable to carry out a thorough assessment of the RRI relevance to territorial governance. The involved territories will act as demonstrators for the potential of RRI on sub-national level. The accumulated knowledge will be used to chart a detailed outlook for the future potential of RRI as a guiding framework in territorial governance of R&I and will aim to provide an evolutionary perspective on RRI for the Horizon Europe programme.

RRI-LEADERS attempts to leverage leadership through three complementary tiers of planned intervention around RRI. For each of these tiers the RRI-LEADERS exemplifies leadership as a proactive, shared and responsible taking of action towards setting ambitions for change and societal transformations, driving collaboration and agreement across societal actors, and striving for excellence and lasting impact in the pursuit of these ambitions. The three tiers of leadership intervention are interlinked into an operational progression, whereby each tier supports and enables the others as the project progresses:

Tier 1 - Leveraging leadership in understanding of RRI proliferation and opportunities in the four territories.

Tier 2 - Leveraging leadership in examining RRI construct relevance to territorial applications and its transformative potential.

Tier 3 - Leveraging leadership in the reaffirming of the RRI concept with a view of providing tighter integration of territorial aspects into a renewed RRI construct.

The present document represents *Project Deliverable 2.2 Report on the RRI policy discourse in the involved territories and* is developed within the framework of WP2 *RRI Audits in the involved territories and partners*. WP2 establishes a clear baseline of existing practices and policy developments that have already integrated or hold the potential to integrate the RRI keys and the AIRR dimensions. WP2 belongs to the first tier of territorial leadership, as presented above.

The report features the following chapters:

- The introductory chapter makes a short introduction to RRI-LEADERS project and explains the place of the current report in the project's development. It includes a short explanation of the RRI framework and the AIRR dimensions.
- Chapter 1 explains the methodology for exploring the relationships between stakeholder organisations and the society at large within the chosen policy areas in the participating territories, from the perspective of RRI.
- Chapters 2 to 5 represent the reports of the four participating territories, presenting the findings from the documentary analysis and participatory workshops.
- The final chapter 6 brings forth a summary of the observations from all four territories and concludes with some key considerations for the transformative outlooks.

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RRI and AIRR Definitions

RRI keys and the AIRR dimensions jointly form the RRI-AIRR approach.

The **RRI policy framework** of the European Commission includes **five thematic keys**: research ethics, public engagement, science education, gender equality, and open access.

- **Public Engagement** is about bringing together researchers, policymakers, industry and civil society organisations and NGOs, as well as citizens, to deliberate on matters of science and technology.
- **Gender Equality** is about fostering gender balance in research teams, ensuring gender balance in decision-making in research, and integrating gender dimension in research and innovation content.
- **Open Access** is about making research findings available free of charge for readers.
- **Science Education** is about making science more attractive to young people (STEM – science, technology, engineering and mathematics) as well as teaching and learning of science to non-scientists, such as school children, college students, or adults within the general public.
- **Ethics** is about conducting research in such a way that allows others to have confidence and trust in the methods and findings of research.

AIRR Dimensions

- **Anticipatory Governance** is focused on harnessing the collective intelligence and wisdom of collaborating organisations and citizens from a given territory (city, region or state) to address strategic risks while at the same time capitalises on emerging opportunities so as to meet the set policy goals of the said territory.[3] Anticipation approaches include foresight, technology assessment, horizon scanning, scenarios, vision assessment, etc.
- **Inclusiveness** deals with the integration of perspectives from a wide range of societal actors (including non-organised and non-institutionalised citizens and community groups) and their involvement in multi-stage co-creation processes in a wide range of policy areas.
- **Reflexive Governance** implies encouraging reflection about societal circumstances in order to reassess practices and adjust initiatives.[4]
- **Responsive and Accountable Governance** places societal needs in the focus of plans and actions of public leadership and governance, and as well engages society in the processes of policy design and decision-making, as well as policy implementation, monitoring and evaluation. It further develops institutions, structures, systems and practices that promote the involvement and participation of the people and ensure equal access to services by all.[5]

[3] Jose Ramos (Action Foresight), Ida Uusikyla and Nguyen Tuan Luong (UNDP Viet Nam) (2020). *Anticipatory Governance — A Primer*. Posted on February 18, 2020 at https://www.vn.undp.org/content/vietnam/en/home/blog/AnticipatoryGovernance.html.

[4] Peter H. Feindt & Sabine Weiland (2018). 'Reflexive governance: exploring the concept and assessing its critical potential for sustainable development.' Introduction to the special issue, *Journal of Environmental Policy & Planning*, 20:6, 661-674, DOI: 10.1080/1523908X.2018.1532562.

[5] Department of Economic and Social Affairs – United Nations (2015). *Responsive and Accountable Public Governance. 2015 World Public Sector Report*. Publication ST/ESA/PAD/SER.E/187, accessible at https://publicadministration.un.org/publications/content/PDFs/World%20Public%20Sector%20Report2015.pdf.

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Chapter 1: Methodology

The current report is elaborated under *WP2 RRI Audits in the involved territories and partners*, Task 2.2 *Mapping of the RRI systems discourse in the involved territories*. WP2 aims to establish a clear baseline of existing practices and policy developments (in the policy areas chosen by the participating territories) that have the potential to integrate the RRI keys and AIRR dimensions (RRI-AIRR approach). WP2 provides a launching point for mainstreaming RRI-AIRR approach in relevant policy goals, implementation routines, municipal / regional strategies. It lays the foundation for understanding how territorial actors might benefit from the adoption of the RRI-AIRR approach in the chosen policy areas.

The policy focus of the participating territories is as follows:

- **Region of Western Macedonia, Greece**: Develop a stakeholder engagement strategy within the course of the post-coal transition road map; Strengthen policy-making systems involving different modes of territorial governance of the post-coal transition strategy; Develop a methodology aiming to a smooth and innovative transition from the coal value chain towards an alternative development 'paradigm'.
- **Sofia Municipality, Bulgaria**: Support to innovation; Digital transition and new skills; Youth employment and entrepreneurship; and Sustainable urban development.
- **Municipality of Thalwil, Switzerland**: Energy transition, focused on reducing the use of fossil fuels and hence the greenhouse gas emissions, and reducing the total energy consumption in the territory of the municipality.
- **City of Sabadell, Catalonia, Spain**: Make the territorial innovation ecosystem more inclusive and better aligned with societal challenges, while respecting and promoting sustainability.

WP2 comprises four tasks:

- Task 2.1 focuses on the mapping of territorial R&I eco-systems and stakeholders.
- Task 2.2, the mapping of the RRI systems discourse in the involved territories, focuses on further exploration/understanding of the relationships between the stakeholder organisations and society at large, within the chosen policy areas in the participating territories, from the perspective of RRI.
- Task 2.3, RRI audit reports of the involved territories, integrates the findings from the activities in Task 2.1 and Task 2.2 and will produce one analytical report per territory on the state-of-play regarding RRI keys and AIRR dimensions.
- Task 2.4, internal RRI reviews in the partners' organisations, will produce a short report for each project partner outlining the areas for targeted measures towards integrating RRI-AIRR approach in their internal policies and practices.

The objective of Task 2.2 is to identify if the RRI keys and the AIRR dimensions are embedded (or not) in the policy discourse and in what way. This deliverable completes the preparatory mapping of the territorial context regarding the embeddedness of the RRI keys in policy and strategic framework documents of each territory. The first two steps of the mapping included semi-structured interviews and focus groups. In all four territories, 90 in-depth interviews were conducted, and 49 stakeholders attended the focus groups.

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Interviewees and focus group participants came from municipal and state administration, non-governmental organisations, research and academia, as well as the business sector. The findings from interviews and focus groups are presented in "Deliverable 2.1: Map on stakeholder relationships and interdependencies and report on stakeholder's need, interest, power and influence."

The current document supplements these findings with an analysis of relevant national and regional/municipal documents, and inputs from a participatory workshop with experts from all stakeholder groups. By doing so, gaps in existing policies and opportunities were outlined, for future integration of RRI-AIRR approach.

The documentary analysis in each territory was carried out in cooperation of methodological and territorial partners. More specifically, the methodological partners were responsible for reviewing the national-level legislation and relevant strategies and programmes related to RRI, while the territorial partners reviewed, and summarised territorial legislation and local strategies and programmes focused on the selected policy areas. The result was a territorial report for each of the four participating territories, which included the gaps identified in existing policies and opportunities for integration of RRI-AIRR approach.

Table 1: Documents examined for the documentary analyses

Documents examined	Region of Western Macedonia, Greece	Sofia Municipality, Bulgaria	Municipality of Thalwil, Switzerland	City of Sabadell, Catalonia, Spain
National	3	10	1	1
Regional/municipal	4	5	3	3
TOTAL	**7**	**15**	**4**	**4**

Each territorial partner organised one participatory workshop, which was a 1-day event that brought together stakeholders, representing academia and research institutes, the private sector, civil society organisations and local authorities. Each workshop started with an introduction of the participants, followed by a short introduction to the RRI-LEADERS project and the findings from the in-depth mapping of each territory from the perspective of Responsible Research and Innovation, as well as from the documentary analysis of national and regional/municipal documents and policies linked to each territory's policy areas. An open discussion followed around a pre-defined questionnaire which included questions regarding the opportunities for the embeddedness of RRI-AIRR approach in existing strategies/programmes/ plans. The workshop discussions were summarised in a report, which included recommendations to local policy and decision-makers on how to identify opportunities/policy areas for integration of the RRI-AIRR approach in future municipal/regional policymaking and strategy development.

The four territorial reports (Chapters 2 to 5) present the main findings from the documentary analysis of the relevant national and territorial level legislative documents, strategies and programmes, analysed from the RRI-AIRR perspective, as well as the summary of discussions from the participatory workshop on mapping of RRI systems discourse in the involved territories.

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Chapter 2: Territorial report of the Region of Western Macedonia

2.1 Introduction

Fair transition to the post-lignite era for Western Macedonia aims to create a new productive-consumer model. This new model includes measures such as a series of investments in RES and industrial production, a shift to tourism and the primary sector. The human resources and the dimension of utilisation and upgrading of skills is emerging as a major issue, to ensure and develop jobs and support the transformation of the regional and especially the local development model. Particular reference is made to the cooperation of all stakeholders with clear roles and the development and operation of a flexible and effective governance system (flows and responsibilities). Everyone's contribution should be systematic and supported by a detailed roadmap. An important element in this regard is the correct capture, selection and inclusion of stakeholders in the process of design, implementation and monitoring and the role they can play for the success of the project and the individual support mechanisms. The active involvement of local communities is important and should be strengthened, based on the governance framework.

All the aforementioned objectives are reflected in the strategic documents of the national and regional policymaking, as being described below. The three policy areas, chosen by the region of Western Macedonia, namely Clean energy, Energy markets, Economic transition towards a low-carbon economy, are in line with those documents.

The aim of the present report is to determine whether the strategic planning of the region in the post-lignite era incorporates the perspective of responsible research and innovation, both at national and regional level. To achieve this, various documents were studied, and as a general conclusion it is reflected that the RRI-AIRR approach is applied to a significant degree and at the policy level in most of these documents, however there are specific keys and dimensions that are lacking in implementation, so it is suggested that they be strengthened in both existing and future policies.

The following **national-level documents** are examined:

- National Energy and Climate Plan.
- Just Transition Development Programme 2021-2027 (SDAM).
- PPC Strategic and Business Plan 2018-2022.

The following **regional-level documents** are examined:

- Road Map for a Managed Transition of Coal-Dependent Regions in Western Macedonia.
- Regional Operational Programme for Western Macedonia.
- Stakeholder Engagement Plan (SEP) for Western Macedonia.
- Territorial Just Transition Development Plan of the Region of Western Macedonia.

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2.2 Documentary Analysis of National Strategic Documents

RRI keys and AIRR dimensions reflected in the National Energy and Climate Plan: Open Access, Public Engagement, Inclusiveness, Anticipatory Governance

The Greek government's strategic plan for climate and energy concerns is the National Energy and Climate Plan (NECP), which lays out a detailed pathway for achieving specified energy and climate goals by 2030. The NECP published in 2019 intends to contribute to the Commission's new green agreement, which is expected to include new procedures and financial priorities for supporting energy and climate transition while simultaneously enhancing the European economy's competitiveness. The NECP's objectives have been quantified and cost-accounted, and intermediate milestones have been established, allowing for tracking of progress toward the goals and linked to the effective adoption and implementation of a combination of policies and measures. These goals and measures will be used to identify and emphasise the need for synergies and complementary activities across all sectors and branches of the Greek economy.

RRI keys reflected in the National Energy and Climate Plan

Open Access: The public has access to the spatial planning authorities' own maps. The purpose is to make data available to users. Certain data and maps are accessible to the general public. The Geoinformation Map of the Energy Regulatory Authority was implemented in the context of the development of the Geospatial Information Infrastructure. The implementation is part of the broader policy of upgrading digital services. It adopts the principles of open access and interoperability in the provision of information. The data, metadata and services are available for free to the public and stakeholders (https://geo.rae.gr/).

In addition, the NECP's Renewable Energy Sources (RES) Account already being implemented has the monthly record of the detailed and segregated by category and/or technology financial inflows and outflows required for the function performed by the competent body (RES and Guarantees of Origin Operator - DAPEEP), which is posted in the form of a monthly bulletin on a specific publicly accessible webpage that ensures the transparent operation of the Special RES Account.

Public engagement: The National Energy and Climate Plan (NECP) is the most formal expression of the Greek government's **public engagement** in drawing up a roadmap for achieving the climate and energy targets by 2030. Consultations with stakeholders, including the social partners, the civil society and the general public, were carried out at different stages of the process of drawing up the NECP. In fact, in order to activate and involve the local and regional authorities in the consultations, a workshop was held during which a questionnaire was distributed, including questions related to the regional dimension of energy and the climate plan, as well as the challenges and obstacles related to its implementation. Through the Operator DAPEEP public consultations are held for the matters of Renewable Sources and relative aspects and through this process public engagement is also ensured.

AIRR dimensions reflected in the National Energy and Climate Plan

Inclusiveness: The NECP has established policies and measures for promoting its goals of energy efficiency. Promoting research and innovation in the energy sector requires the active involvement of all market players. Synergies influence the strategic decisions made by companies in the sector (power transmission and distribution), as well as the policies pursued by public bodies and authorities and the mechanisms used to

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finance the activities taken by the enterprises. Horizontal support policies for promoting inclusiveness at the moment include:

1. A monitoring and control mechanism are established to maximise synergies between energy, research, and competitiveness programmes, as well as providing the required resources to support it.
2. Partnerships between all stakeholders by supporting advisory and networking actions among stakeholders to facilitate the transfer of know-how and the maximisation of synergies are being promoted.

Anticipatory Governance: Several examples of anticipatory governance principles reflected in the NECP can be outlined. The Renewable Energy Sources (RES) Account support scheme's long-term viability has now been accomplished by recent legislation aimed at ensuring sufficient and consistent inflows of financial resources as well as streamlining the inclusion of key revenue categories. DEDDIE (which is the Hellenic Electricity Distribution Network Operator) has already completed preliminary studies to determine the distribution network's required enhancements, including the number of high/medium voltage transformers that will be congested and thus require enhancement, as well as the corresponding distribution lines that will exceed the RES feed-in capacity and thus require enhancement. The goal of this study was to develop a methodology for estimating expected investment costs, to identify geographically critical areas of intervention in terms of distribution network enhancement, and to consider the demand for simultaneous inclusion of new RES projects when assessing substation enhancement.

RRI keys and AIRR dimensions reflected in the Just Transition Development Programme 2021-2027 (SDAM): Public Engagement, Open Access, Science Education, Inclusiveness, Anticipatory Governance, Responsiveness

The Just Transition Development Plan of the lignite areas of Greece aims at creating strategic development opportunities for the rebirth of local economies, securing jobs, and creating new ones. It is based on five pillars of development, supported by the improvement of infrastructure and the alternative use of the lands currently occupied by lignite mines. The five pillars are green energy, "smart" agriculture, sustainable tourism, handicrafts and industry and finally digital economy and education. Since March 2020 significant work has been produced in a short period of time as it will be described below RRI-AIRR approach is embedded in the development of the plan.

RRI keys reflected in the Just Transition Development Programme 2021-2027 (SDAM)

Public Engagement: An open public consultation has been a very important tool in the design of the strategic plan and the intervention measures, in combination with the open data. To ensure the wide and varied stakeholder participation, all relevant stakeholders were contacted and informed where they can find the plan online and how they can respond. The institutional public consultation officially kicked off a constructive dialogue with all stakeholders and the public on the proposed master plan, with the goal of enriching and co-forming the final master plan.

Open Access: The consultation website as well as the Steering Committee website were two of the basic online sources of SDAM and all the supporting material.

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Science Education: The contribution of the academic community to the progress of the project has been very important so far for the preparation of works related to spatial planning. In addition, there was continuous and close cooperation to co-shape the role that the institution could play, both as a re-skilling body and as a development body of the region. A variety of studies contacted by the scientific community and prestigious institutions were used in the development of the master plan. These investigations were utilised for a variety of purposes, including recording the current situation, doing methodological analysis, and gathering recommendations for the future.

AIRR dimensions reflected in the Just Transition Development Programme 2021-2027 (SDAM)

Inclusiveness: The SDAM has participatory governance model, based on the collaboration and involvement of many stakeholders. Open invitations have been published for the submission of non-binding investment proposals and development plans by non-public sector bodies. During the master plan's development, a constant and open communication with stakeholders in Western Macedonia and Megalopoli, the two areas entering the post-lignite era in Greece, was maintained. Proposals and local master plans were gathered and considered by a number of local entities during the development of the master plan.

Anticipatory Governance: Support of companies affected by delignification, as well as the reinforcement of current and future investments, is expected to be achieved through the provision of unique institutional incentives (financial, tax, insurance, and licensing), as well as the use of all available resources. In this context, there is a comprehensive package of fifteen individual incentives, categorised into the following three groups:

- **Incentives to attract a new production process:** These include provision of a grant for new investment, tax exemption, tax relief, subsidy of insurance contributions, exemption of fees, loans on favourable terms and guarantees.
- **Incentives to maintain the existing operation:** These incentives include provision of a grant to reform / modernise the production operation, the subsidy of loan obligations, the subsidy of wage costs, the participation in equity and the loans on favourable terms
- **Incentives to support individuals:** These incentives relate to income tax deduction, mortgage subsidy and support for projected benefits and training programmes.

Responsiveness: A number of studies have been carried out analysing the economic activity, the social conditions and the energy profile of the area. The results of these studies constituted an important source of information for the preparation of SDAM. The National Plan for Just Development Transition has also satisfactorily integrated the responsiveness dimension, as it has introduced new regulations and legislation tailored to the needs of the transition.

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RRI keys and AIRR dimensions reflected in the PPC's Strategic and Business Plan 2018-2022[6]: Science Education, Anticipatory Governance

The Greek energy market is quickly changing across the value chain (lignite plant divestment, retail market opening, and adoption of the new target model), and the Greek electrical grid is likely to be extremely constrained, owing to lignite plant decommissioning. Within this framework PPC has established its Strategic and Business Plan, which will safeguard its resilience and transform it to a modern and cutting-edge utility. Its major strategic priorities are Renewables (RES), Distribution assets, Retail and New Downstream, Mines & conventional generation, Central & Support functions, International Expansion, New Services and Products and a Regulatory Agenda. The Business Plan does not refer to RRI framework but pays attention to the issue of science education as well as to the dimension of anticipatory governance.

RRI keys reflected in the PPC's Strategic and Business Plan 2018-2022

Science Education: The plan focuses on excellence and investments; therefore, a basic objective is the increase of qualified researchers. Moreover, it targets to the development of new research projects in international markets.

AIRR dimensions reflected in the PPC's Strategic and Business Plan 2018-2022

Anticipatory Governance: New green investments will be made considering renewables' projected attractiveness compared to conventional power generating sources, as well as continued trends in electricity demand growth, energy efficiency measures, new technologies, and decarbonisation. Under the strategic and business plan, PPC repositions the go-to-market strategy by focusing on retaining high-priority customer segments, revising its branding and pricing, and expanding its core activities to offer a wider range of energy services and products, including electricity-gas double play and energy efficiency services. In addition, through the plan the increase of the share of RES in PPC's energy mix by approximately 600 MW by 2022 is being addressed, which will come mainly from Wind and Photovoltaic, given their expected attractiveness to other energy sources, through a significant increase in the size, number of projects and RES capabilities, with specific objectives in terms of power and efficiency. Target for participation of RES in the total power of PPC at a rate of 20% - 25% by 2030-2035.

2.3 Documentary Analysis of Regional Strategic Documents

RRI keys and AIRR dimensions reflected in the Road Map for a Managed Transition of Coal-Dependent Regions in Western Macedonia: Science Education, Gender Balance, Open Access, Anticipatory Governance

In Western Macedonia, like in any other coal-dependent area, planning and implementing a well-managed transition will be a multi-year and multi-level effort. In the first phase, governance structures should include multi-level participation from local, regional, and national level authorities, as well as other stakeholder

[6] https://www.dei.gr/en/anakoinwseis/xrimatistiriaka-etairikes-prakseis-katavoli-merismatos-ka/xrimatistiriakes-anakoinwseis-2018/i-dei-anakoinwnei-to-stratigiko-kai-epixeirisiako

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organisations, to ensure that those who are most affected commit to plans. The Road Map proposes four pathways for the transition from coal dependence. These routes highlight the region's current characteristics and strengths. They address the lack of key enabling conditions that allow for the growth of entrepreneurship, innovation, and human capital. All the proposed transition paths are important and interconnected, and they indicate the needed diversification for the local economy to move away from relying solely on energy to generate value across multiple sectors. These pathways emphasise existing attributes and assets of the region and are:

- Alternative Energy Transition Pathway
- Start-up Economy Transition Pathway
- Digital Region Transition Pathway
- Green Region Transition Pathway

Underpinning these four pathways, six indicative pilot projects are in progress. Project themes range from building an alternative energy cluster to digital twinning of rural areas to agri-business development and to circular economy businesses.

RRI keys reflected in the Road Map for a Managed Transition of Coal-Dependent Regions in Western Macedonia

Science Education: On the forefront of developments, the Digital Region Transition Pathway aims to hasten the digital transformation of the region's urban and rural regions, which is a critical instrument for keeping the young people in the region and fostering economic growth. By 2030, this transformation route aims to convert Western Macedonia into Greece's most e-connected, high-tech, futuristic area. The entire region currently is moving in this direction, and this can be seen from the creation of a wide range of new internet-based businesses to a greater emphasis on STEM and robotics instruction in public schools. Infrastructure and expertise to support STEM-focused activities are included in the investments.

Gender Balance: This strategic plan, prepared by the World Bank, has significantly ensured **gender equality** in the composition of the international research teams. Moreover, an action proposed in this document towards gender balance refers to the organisation of at least one competition a year to support projects to narrow the potential negative impacts on women because of the transition.

Open Access: Open Access component is also found, as the findings of all relevant studies with their appendices are available online and free of charge for readers which also improves the transparency and accountability. The establishment of a national platform for dialogue and consultation on post-lignite transition is also proposed in the road map.

AIRR dimensions reflected in the Road Map for a Managed Transition of Coal-Dependent Regions in Western Macedonia

Anticipatory Governance: Since the beginning of the strategic implementation of the Road Map's milestones, the Land Use Repurposing Assessment (LURA) methodology that has been developed has been an objective tool used for the determination of post mining land use with a high spatial resolution and a high degree of reproducibility. This methodology provides guidance on the sorts of post-mining uses to consider for a given parcel of land, but it does not prescribe a specific investment scenario. As a result, it is not a stand-alone application. Other planning instruments are linked to LURA that are higher-level planning instruments with

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broader geographic scopes connected to planning instruments of economic development plans of adjacent municipalities. The dimension of anticipatory governance through the transition's road map can be seen in the present Elefsina pilot, which is being implemented in the towns of Elefsina, Asporpyrgos, and Mandra. Wage subsidies, entrepreneurship, and demand-responsive training were the three primary Active Labour Market Programmes (ALMPs) (theoretical training and internship). A demand-responsive training (DRT) component was included to make regionally appropriate professional skills development training available to registered jobless participants on a continual basis. Data from the local labour market is utilised to determine skill shortages and company requirements. The programmes developed to meet these demands are modular and based on industry standards recognised by employers and industry groups.

Recommendations

This plan does not reflect to the degree that it should, the element of public engagement from the Greek government's side, as its implementation was funded by the European Commission and drafted by the World Bank as a draft text of a Roadmap for Transition. The document shows the importance of involving all stakeholders from the quadruple helix and proposes public consultation on all relevant documents and studies related to the post-lignite era, as well as the creation of a national platform for dialogue and consultation on post-lignite transition.

RRI keys and AIRR dimensions reflected in the Regional Operational Programme for Western Macedonia: Science Education, Open Access, Inclusiveness

The aim of the programme is to contribute to the creation of a sustainable, competitive, regional economy with sustainable jobs, a quality environment and social cohesion. The objectives are to improve the business activity at a competitive level with emphasis on the sectoral and localised specialisation through the smart specialisation strategy of the Region (RIS3); to support the transition to a low carbon economy and promoting adaptation to climate change; to promote sustainable transport and troubleshooting basic network infrastructure; to ensure social cohesion and enhancing sustainable employment.

RRI keys reflected in the Regional Operational Programme for Western Macedonia

Science Education: Some indicative actions that have been implemented through the Regional Operational Programme to strengthen research, technological development, and innovation, and upgrade existing and create new research infrastructure, are:

- Establishment of a new campus of Western Macedonia for strengthening the research dimension in the region.
- An upgrade of secondary education infrastructure.
- Collaborative and networking actions between research institutions, educational institutions, and companies in priority areas of the Strategic Smart Specialisation Plan of the Region.
- Actions to promote research and innovation in companies in priority areas of the smart specialisation strategy plan of the Region.

Open Access: Through the Regional Operational Programme there has been an improvement in the access, use and quality of information and communication technologies as well as on publicly accessible information

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and data to citizens. Four major applications that promote open access have been established on a regional level:

- E-government services and applications for citizens and businesses.
- Actions to promote culture and improve tourist traffic.
- E-learning and e-content services and applications.
- Health services and applications - welfare and social inclusion.

AIRR dimensions reflected in the Regional Operational Programme for Western Macedonia

Inclusiveness: The ROP has as a separate unit the promotion of social inclusion and the fight against poverty and discrimination, with actions such as enhancing the access of disadvantaged people to the labour market. ROP provided an inclusive model for business support actions for the implementation of innovations and / or research and technology results. This has led to the creation of structures that currently support competitiveness, innovation and business extroversion (incubator, regional structure for business development), and networking among various stakeholders. Business support actions have led to the creation of collaborative schemes (clusters) and networks with emphasis on priority areas and extroversion-oriented business and cluster support actions with an emphasis on local products and services have been established.

Recommendations

There is a need of enhancement of the objectives of Science Education in the context of the actions regarding the Regional Strategies and Action Plans.

RRI keys and AIRR dimensions reflected in the Stakeholder Engagement Plan (SEP) for Western Macedonia: Public Engagement, Open Access, Responsive and Accountable Governance

The goal of the Stakeholder Engagement Plan (SEP) is to identify, prioritise, and promote consensus and fact-based solutions to the post-lignite transition, including all its consequences for local communities, workers, and the regional economy. It is an important part of the preparations for managing this transition, with the goal of ensuring that informed decisions are made that consider the perspectives of impacted workers and communities, as well as other stakeholders such as industry, government, donors, and non-governmental organisations.

RRI keys reflected in the Stakeholder Engagement Plan (SEP) for Western Macedonia

Public Engagement: Attention has been paid to find approaches and means to ensure outreach and active engagement of particular vulnerable groups such as youth, women and other groups not proportionally represented among existing interest groups. Existing consultative fora and approaches were further mapped and assessed for their utility in the consultation strategy. Institutional public consultations officially initiated a constructive dialogue with all stakeholders and the public on the proposed plan, with the goal of enriching and co-forming the SEP.

Open Access: SEP follows the government's Action Plan for Open Public Administration, which comprises commitments structured in three main directions (i) Encouraging public participation; (ii) Open public data;

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and (iii) Integrity and accountability. Having this in mind, the national opengov.gr platform can be copied for setting up a similar system by the provincial government, but it would be supplemented by other approaches to ensure broad information sharing across the socially diverse stakeholder group.

AIRR dimensions reflected in the Stakeholder Engagement Plan (SEP) for Western Macedonia

Responsive and Accountable Governance: The first step was made by mapping stakeholders to understand the different stakeholder challenges, positions and roles in the context of the post-lignite transition and the future regional development strategy. As a next step, stakeholder consultations have been conducted and generally characterised by the following aspects:

- There has been a sustained engagement through the project lifecycle rather than a onetime conversation.
- All the relevant stakeholders have been included in the development process of the transition so far.
- Information sharing and open access of transparent procedures has established a dialogue on how to tackle the given challenges ahead and solutions to those challenges have already started to be developed based on data and research.
- A strong stakeholder communication strategy to sensitise stakeholders has been conducted, and currently there is an ongoing sharing of knowledge and facts between affected parties that increase ownership of agenda by local stakeholders and improve transparency in decision making.

Recommendations

More detailed measures related to RRI keys such as gender equality and science education should be included.

RRI keys and AIRR dimensions reflected in the Territorial Just Transition Development Plan of the Region of Western Macedonia: Public Engagement, Anticipatory Governance, Inclusiveness

The Just Transition Development Plan for Greece's and especially Region of Western Macedonia's lignite districts intends to create strategic development possibilities for local economies' revival, employment security, and job creation. It is built on five pillars of development, which are bolstered by infrastructural improvements and the repurposing of lignite mine-affected land. Green energy, "smart" agriculture, sustainable tourism, handicrafts and industry, and digital economy and education are the five pillars. Since March 2020, a lot of work has been done in a short amount of time, and the RRI and AIRR dimensions have been included into the design, as stated below.

RRI keys reflected in the Territorial Just Transition Development Plan of the Region of Western Macedonia

Public Engagement: So far, through the actions of the Just Transition Development Plan there has been a public consultation with the relevant local bodies and local communities, the boards of private institutions and chambers and the provision of directions to them for the planning and implementation of the plan. The activities supported by the Fund contribute to the implementation of the Territorial Plans for Just Transition and have an eligibility start date of January 1, 2021 which already include actions made for upgrading skills and acquiring new skills by employees; job search assistance to jobseekers and active inclusion of job seekers.

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AIRR dimensions reflected in the Territorial Just Transition Development Plan of the Region of Western Macedonia

Anticipatory Governance: The spatial planning has been adjusted to meet the area's development goals. The Regional Spatial Framework of Western Macedonia, in particular, has already been modified to account for delignification demands. This plan is an important development tool since it explains what activities may be done where and how they can be used. In addition, there has been a support scheme in progress for firms affected by delignification, as well as the reinforcement of existing and future investments, that will be achieved through the provision of specific institutional incentives (financial, tax, insurance, and licensing), as well as the utilisation of all available resources.

Inclusiveness: The inclusiveness dimension has been significantly integrated, as this project has been initiated because of extensive consultation with local and scientific bodies, workers, and civil society representatives. Moreover, through the Small and Medium Enterprises Support and Aid Programme there has been a granted assistance from the Green Fund to small and medium-sized enterprises from Western Macedonia affected by delignification. The purpose of this action is currently to make the operation of these companies more environmentally friendly. Creation of an Innovation Zone in the current energy axis of Kozani, Ptolemaida, Amyntaio and Florina, according to the standards of the international Innovation Zones is currently in progress that is expected to network a significant number of stakeholders. The University of Western Macedonia in partnership with the National Centre for Research and Innovation (CERTH) is collaborating for the final result.

Recommendations

Ethics and gender equality could further be addressed.

2.4 Report from the Participatory Workshop in the Region of Western Macedonia

The participatory workshop was held in Kozani on July 19, 2021, with 13 participants representing academia and research institutes, the private sector, civil society organisations and local authorities. The workshop started with an introduction of the participants, followed by a short introduction to the RRI-LEADERS project and the findings from the in-depth mapping of the region of Western Macedonia, from the perspective of Responsible Research and Innovation, as well as from the documentary analysis of national and regional documents and policies linked to the three policy areas, chosen by the Region of Western Macedonia: 1. develop a stakeholder engagement strategy within the course of the post-coal transition road map, 2. strengthen policy-making systems involving different modes of territorial governance of the post-coal transition strategy, 3. develop a methodology aiming to a smooth and innovative transition from the coal value chain towards an alternative development 'paradigm'. Then, two keynote speakers with knowledge and expertise in the territorial policy focus made their presentations. The keynote speakers had also participated in the first phase of the project (Task 2.1), being among the interviewed stakeholders. Their presentations focused on the RRI-AIRR approach and initiated the open discussion that followed. The themes of the two presentations were: "Responsible Research and Innovation - Fair Transition of Western Macedonia

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to an Alternative Development Model" and "Entrepreneurship and Innovation Support Tools in the post-lignite era".

An open discussion followed around a pre-defined questionnaire which included questions regarding the opportunities for the embeddedness of RRI-AIRR approach in existing strategies/programmes/ plans in the three mentioned policies, as well as the perception of stakeholders on the connection of RRI principles with three major challenges of fair transition in the region, namely the development of renewable energy resources, tackling of unemployment and the governance of fair energy transition. The main points of the discussion per policy are summarised below.

First keynote speech

The Region of Western Macedonia is rightly characterised as the region of energy, with a very large percentage of participation of the energy sector in the gross added value. At the moment, a programme of fair development transition model is being developed in the Region. Starting with delignification, given the structural weaknesses of the economy, high unemployment and the lack of alternatives, the region must focus on responsible research and innovation to create a new growth model. The formulation of the plan for a fair development transition was based on an inclusiveness process during its formulation. Numerous consultations took place with participating actors from the quadruple helix. Another element of concern is the governance mechanism of the transition. It was stressed that since the governance mechanism of the whole transition project is essentially launched at the central level, the regional structures and the regional bodies do not participate to the extent that they should participate. Another point we need to focus on is what we call the interconnection of research with industry and ultimately with the modernisation of companies. The research produced must be applied, meet the needs of local businesses and vice versa, local businesses must reflect to the new trends, and respond to new market needs to survive in the new globalised market model.

Second keynote speech

The support structure was created in the framework of the project of the regional development fund of Western Macedonia with the general purpose of supporting entrepreneurship and innovation, considering the course of the energy transition in the region. The goal is to act as a catalyst in the more effective implementation of the Smart Specialisation Strategy of the RWM, supporting the governance mechanism, providing documentation, information, and liaison. All four tools of the structure were designed with the principle of open access, and they constitute a very interesting paradigm towards a smooth and innovative transition from the coal value chain. Regarding the Research and Innovation Portal, businesses will benefit from the portal through gaining information and networking opportunities, while the regional authority will monitor the image of the region through the innovation indicators that will be recorded and will be able to make informed decisions. The Integrated Information System (IIS) of the region is created to provide the software infrastructure in functionality so that multi-criteria data set analyses can be implemented. This is an experimental application of modern IT techniques which have not been applied in another similar structure in Greece. The Employment Enhancement and Monitoring Portal is a tool for conducting primary employment research, helping to monitor employment trends and highlight business needs and available resources. It encourages the coupling of companies with the appropriate staff and the data of ergasiaRWM

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in combination with the data of the system from Ergani, OAED and the IIS will provide substantial monitoring of the development of employment. It is a substantial development of the oldest successful portal, ergasiakozani, with current purposes on the one hand to serve the whole region and on the other hand to collect and utilise data on the needs of companies in trained staff and availability. This tool is proposed as of major importance in the development model of the region, given the unemployment that will arise from the period of the energy transition. The last tool is the Investor Support Network (ISN). The role and services of ISN is to create a friendly environment in which the entrepreneur feels it is worth the risk, to invest his money and to have the RWM support. Moreover, the services include the provision of personalised information, networking opportunities, funding opportunities, bureaucratic summary forms, grievance redressal issues, business discovery data collection, monthly reports of complaints and bureaucratic procedures corrective actions, semi-annual (or annual) progress reports on potential investments, and meetings with qualified staff from the region will be scheduled, depending on the criteria to be determined.

- **Policy Area "Develop a stakeholder engagement strategy within the course of the post-coal transition road map"**

Participants began the discussion with the first policy area, the engagement strategy, commenting on the implementation of the RRI framework and proposing concrete measures for its further integration. As mentioned above the participants in the workshop represented the whole quadruple helix. All of them stressed the presence of public involvement in the process of shaping policies related to energy transition in the Region. More specifically, with respect to public engagement, several consultations were held with all quadruple helix stakeholders. It should be noted that the process was negatively affected by the pandemic, since all the procedures were done through teleconferencing and remote process. Participants from the academia emphasised that the role of the University and the research bodies was crucial in shaping the programme of fair transition. In addition, taking into consideration the importance of the private sector in the post-coal roadmap, the participation and ideas from the companies were also considered of high importance for the next phase of the Region of Western Macedonia. The participation of civil society was considered satisfactory, but many participants felt that the voice of the local community in the participatory process could be greatly strengthened. In this direction they proposed a public information campaign of the local community in general about the energy transition but also about the available tools that exist to activate their participatory action. Taking into consideration that regional strategies developed for the region were planned to follow a participatory process, views differed on the intensity of the participatory process as well as on the evaluation of the consultations on energy transition and the exploitation of results.

On the issue of enhancing stakeholder engagement within the course of the post-coal transition road map, a very important structure, the Support Structure[7], has been developed in the framework of the project of the regional development fund of Western Macedonia with the general purpose of supporting entrepreneurship and innovation. This structure, as it was presented by the second keynote speaker, has developed several open access tools, all of which have been designed to provide two-way communication with all actors in the Region and to enhance the use and effectiveness of the tools. Science education will also be enhanced through the structure by making science more attractive to people who will be unemployed in the region

[7] https://pta.pdm.gr/domi-ris-dyt-makedonias/

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after the transition, as well as promoting innovation and entrepreneurship activities. The tools of the structure are key means for enhancing communication between all stakeholders, the region, citizens, academia and the business sector in terms of both policy preparation and shaping, as well as ongoing business discovery, as it will allow data, ideas and suggestions to be collected, which will determine the next steps to support entrepreneurship in a process of continuous improvement. Therefore, participants consider this structure as a catalyst for the reinforcement of stakeholder engagement in the energy transition roadmap of the region, the open access enhancement to all studies and indicators, as well as to promoting science education.

The importance of gender equality was also mentioned by participants. It was stated that in all consultations and discussions on the roadmap for the transition, the principle of gender equality was considered necessary and there was always an almost equal number of participants of both sexes.

- **Policy Area "Strengthen policy-making systems involving different modes of territorial governance of the post-coal transition strategy"**

To start the discussion on this policy, the mentimeter tool was used, and participants were asked how they perceive Responsible Research and Innovation in relation to the governance of fair transition. The words that appeared in order of priority were cooperation, quadruple-helix participation, transparency, decisions at the local level, reduction of bureaucracy. Based on these words an open discussion followed.

Regarding the just-transition governance mechanism, participants expressed their concerns. Key component of the governance mechanism of just transition, are the establishment of a partnership, the strengthening of social dialogue and the more efficient absorption of resources based on a multilevel governance structure. In practice, however, it turned out that the proposed structure is very central, reflecting a strong ''top-down'' model. More specifically, the central coordinating intergovernmental committee has the dominant role in the planning, approval, and implementation of critical interventions. On the contrary, the role of local actors, on the other hand, is mainly suggestive and less decisive. As a result, local actors can hardly take ownership of the transition plan. There is also a requirement of international regulations in regions in a transition that fosters the active and essential role of the local community.

The participants suggested that in matters of governance the Region is called upon to find a combination of efficiency, decentralisation, transparency, networking, monitoring and evaluation mechanisms. This is certainly not at all simple, as what has been proposed is clearly a top-down model and not a model that largely considers regional and local structures. The proposed solution is not a fully regional form of government, but it is proposed to turn to a model that combines local actors with central ones.

It has been stressed that the approach of anticipatory governance in general characterises the policy-making process, since the region must consider the future implications of post-lignite-related policies. It was even emphasised that the energy transition plan is not a current problem. Discussions started several years ago with some plans that had been made earlier. So, the region had begun to make some predictions about possible solutions and measures that would have to be taken to address the challenges of the energy transition. Participants mentioned that the region needs to become even more responsive during this phase, to develop future scenarios to overcome the post-lignite era challenges, improving thus its anticipatory governance.

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Regarding open data, the new tools developed by the Support Structure in the region, provide a mean for a dissemination of information, ideas, data and all the selected indicators regarding innovation and entrepreneurship to the public and to the private sector.

It was stressed that the key of scientific education should be greatly strengthened. In local government-related policies, the enhancement of science education has been identified as being of major importance for the post-coal transition strategy. The promotion of entrepreneurship from secondary education, the organisation of business idea competitions, the development of research and innovation in renewable technologies are some of the proposals made.

- **Policy Area "Develop a methodology aiming to a smooth and innovative transition from the coal value chain towards an alternative development 'paradigm'"**

Discussions towards this policy revealed that the RRI-AIRR approach has been largely integrated into both regional and national strategies. The Just Transition Development Plan is an operational framework that expresses the central government's public engagement to the energy, economic and social challenge of de-lignification and the reduction of oil dependence. The communication with all the stakeholders regarding the plan of decarbonisation of the domestic power generation is one of its main goals. Therefore, public engagement, mainly through public consultation, was largely implemented to formulate the methodology for the smooth transition. At this point, the active participation of many actors was emphasised, covering the quadruple helix, however, some participants expressed their objections to the active participation of civil society. Moreover, in this plan as well as in most of the studies conducted for energy transition, participants agreed that the dimension of responsiveness is quite evident, since they reflect an effort to meet the needs and expectations of society. In addition, as reflected in the conclusions from the questionnaires and the focus group conducted in May 2021, the dimension of reflexivity is directly linked to that of responsiveness, as the needs of society are constantly changing due to the energy transition and therefore a continuous analysis at social and economic level is needed so that policies meet the real needs.

A top priority issue of the plan is to secure jobs and to utilise the high know-how of human resources in the designated areas. The problem of unemployment is one of the main challenges of the energy transition in Western Macedonia. The role of science education is considered crucial towards this challenge. Now, there are a lot of actions taking place, especially towards research and innovation activities in renewable energy sources as has been stressed by the academia participants, but they are not well communicated. This results also in the non-capitalisation of research results. Moreover, the potential of citizen science is something that needs to be studied and exploited, as it can be a key source of new ideas.

Using the mentimeter tool, participants were asked how integrating Responsible Research and Innovation in policy level can help towards unemployment. The words that appeared in order of priority were retraining, business support, start-ups. In the light of the above, participants agreed that science education is the appropriate RRI key to deal with this challenge. Initially they proposed the use of renewable energy sources, increasing thus research and innovation activities, but there is a strong concern as to whether these sources can eventually replace such a labour-intensive productive activity. The role of educational institutions and research institutions in the context of re-skilling of human resources was emphasised here, something that also had emerged from the interviews of the stakeholders in the first phase of the project. In addition, the

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participants stressed the importance of strengthening the manufacturing sector, which in combination with the development of the primary sector will form sustainable value chains in the agri-food sector, which is dominant within the primary sector.

The use of renewable energy sources and generally the creation of an alternative model based on renewable sources was the next topic discussed. Using the mentimeter tool, participants were asked how integrating Responsible Research and Innovation in policy level can help towards the development of renewable energy resources. The words that appeared in order of priority were responsibility, contribution in employment, transparency, open access, consultation. The issue of responsibility is characterised as of major importance in environmental management. The participants emphasised the shift in the development of photovoltaic parks, something for which the appropriate environmental study is deemed necessary. In addition, many of the participants expressed their fears about the viability of the project as well as the next concept that emerged, that of contributing to employment. The unemployment rate projected in the region due to the energy transition is multiple compared to the jobs that the installation of photovoltaic parks will bring. That is why in these policies, anticipatory governance will play a very important role, to capture future results and thus choose the right decisions. Inclusiveness also plays an important role here, as the integration of perspectives from a wide range of societal actors can determine a better outcome. In addition, open access is very important, both for information issues and for data entry from all actors.

Strengthening and promotion of entrepreneurship, should constitute key steps in the methodology towards a smooth transition, something which was identified in the context of all the consultations that preceded in task 2.1 of the project. To increase entrepreneurship, the participants proposed the strengthening of scientific education. In this direction business opportunity initiatives must be implemented, such as business plan contests, creating information places for start-ups, etc.

The key to open access has also been used in both regional and national policies, but participants stressed that through the tools of the new area support structure, open access can be greatly enhanced. The goal of the region during the energy transition is to develop an alternative growth model with an emphasis on innovation. Western Macedonia in terms of innovation belongs to the category of moderate innovators. So, to lead the Region in a sustainable solution in the context of the energy transition it will essentially has to reverse its weaknesses, find solutions that will transform it from a moderate innovator to a strong innovator. Participants noted that science education is considered crucial also towards this direction.

Regarding the development of a methodology for a smooth and innovative energy transition the participants also referred to the fact that there are a lot of similar regions in Europe now which are facing the same challenge as the region of Western Macedonia. There is a process called “regional dialogue” which is essentially an action developed by the European Commission to develop partnerships between regions in energy transition. These synergies will help these regions with issues of growth and innovation as well as measures that will lead to a smoother transition. This is a very important action proposed in the region of Western Macedonia to follow it as in this way it will be able to have a more general, European picture, regarding the innovation trends in other regions and to receive ideas and solutions for its development

Regarding the Support Structure that has been developed in the region, as has been mentioned above, its four tools constitute a very interesting paradigm towards a smooth and innovative transition from the coal value chain. With respect to the Research and Innovation Portal, businesses will benefit from the portal

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through gaining information and networking opportunities, while the regional authority will have a tracked image and informed decisions. The Integrated Information System (IIS) of the region is created to provide the software infrastructure in functionality so that multi-criteria data set analyses can be implemented. This is an experimental application of modern IT techniques which have not been applied in another similar structure in Greece. The Employment Enhancement and Monitoring Portal is a tool for conducting primary employment research, helping to monitor employment trends and highlight business needs and available resources. It encourages the coupling of companies with the appropriate staff and the data of ergasiaRWM in combination with the data of the system from Ergani, OAED and the IIS will provide substantial monitoring of the development of employment. It is a substantial development of the oldest successful portal, ergasiakozani, with current purposes on the one hand to serve the whole region and on the other hand to collect and utilise data on the needs of companies in trained staff and availability. This tool is proposed as of major importance in the development model of the region, given the unemployment that will arise from the period of the energy transition. And the last tool is the Investor Support Network (ISN). The role and services of ISN is to create a friendly environment in which the entrepreneur feels it is worth the risk, to invest his money and to have the RWM support. Moreover, the services include the provision of personalised information, networking opportunities, funding opportunities, bureaucratic summary forms, grievance redressal issues, business discovery data collection, monthly reports of complaints and bureaucratic procedures corrective actions, semi-annual (or annual) progress reports on potential investments, and meetings with qualified staff from the region will be scheduled, depending on the criteria to be determined.

2.5 Summary remarks

Overall, discussions in the workshop came to some very useful conclusions about how the territorial stakeholders perceive responsibility in research and innovation, as well as the RRI keys and AIRR dimensions and their relevance to the overall development policy of the territory. The workshop participants agreed that the RRI keys and AIRR principles are followed to a significant extent in the policymaking of the region, but also mentioned many new policies and procedures that RRI principles can be applied in the future. The same picture applies to national policies.

Regarding public engagement and inclusion, all participants reported that the consultation tool was mainly applied to a large extent in the design of the energy transition framework of the region, with the participation of all the actors of the quadruple helix. However, it has been stressed that the voice of the local community could be strengthened by actively engaging it in the participatory process.

On the issue of open data and open access, different views arose from the participants. Initially, all participants agreed on the fact that policy decisions as well as consultation decisions are all published in an open database. What has been highlighted as a problem is the evaluation process of all public consultations. As a future step to confront this problem, the tools of the support structure of the region were presented, and more specifically the research and innovation portal and the integrated information system. The first will be an online platform that could be used for gathering information, ideas, etc. from stakeholders, while the second will proceed to a multi-criteria analysis of all data, as an evaluation tool to generate answers and provide specific solutions at the regional level.

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Both at the national and regional policy level, the lack of ethics and gender equality keys was emphasised. Moreover, reflexivity and responsiveness were identified in most policy documents and were described as two connected dimensions, a result that corresponds to the findings from the interviews and the focus group.

Another issue discussed in the participatory workshop was the process of communication and territorial governance. Here, participants see the need for a process that combines efficiency, decentralisation, transparency, and evaluation. It was stressed that the model currently applied, the top-down model, is a model that largely ignores regional and local structures. For this reason, the participants proposed the use of a combined model of governance, which will combine local and central actors. It was also suggested that the implementation of the integrated information system now developed by the support structure of the Region will be of major importance for future implementation in the context of responsible research and innovation. This tool will evaluate all actions and future innovative ideas and will propose after analyses the best ideas for implementation in the Region of Western Macedonia.

Given the third policy area for the region of Western Macedonia, participants emphasised the role of integrating science education in the policy level, fostering research and innovation activities through initiatives such as seminars, competitions, business plan contests etc. The area is classified as moderately innovative. Therefore, it was suggested by the participants that to move to a sustainable solution in the context of the transition, the region would have to substantially reverse the weaknesses and identify solutions that would transform the RWM from moderate to strong innovative.

Concrete measures proposed for the region of Western Macedonia are the following:

- Strengthening and promoting entrepreneurship as well as re-skilling of human resources to combat the unemployment that will arise in the post-lignite era. The application of scientific education can play an important role at this point, through the development of seminars, educational activities, and the promotion of innovation.
- One point on which the Region should stand is the connection of research and development with the modernisation of companies. The research produced must be applied and should follow the responsiveness of the local markets and vice versa, local businesses must respond to the new trends and the new needs of the markets to survive in the new globalised market model. This concludes with the demand for the Region of Western Macedonia which is the creation of viable value chains in areas of regional smart specialisation. One such area, concerns the development of the agri-food sector in the region, which. It was therefore stressed that there needs to be a connection between the agricultural department's research of the University with the agri-food sector in Western Macedonia.
- The Region should follow a responsive and accountable governance by participating in the "regional dialogue". This is an action developed by the European Commission to develop partnerships between regions in energy transition. These synergies will help these regions with issues of growth and innovation as well as measures that will lead to a smoother transition.
- Finally, the promotion of the new Support Structure that has been developed in the region, constitutes a very interesting tool for integrating the RRI-approach towards a smooth and innovative transition from the coal value chain.

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2.6 Conclusions

In this analysis, a total of three national level and four regional level documents related to the energy transition in Western Macedonia were studied. The overall picture shows that in all documents the RRI-AIRR approach is followed and applied to a significant degree, with public engagement, open data access, inclusiveness and anticipatory governance featured most prominently.

The conclusion in discussions during the participatory workshop showed that in the plan for the fair transition in the region but also in the general policies related to the post-lignite era, the keys and dimensions of responsible research and innovation have a significant application, however, the strengthening of their application in both existing and future policies, proposing concrete ways and tools to achieve this, was considered by all participants to be of particular importance.

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Chapter 3: Territorial report of Sofia Municipality

3.1 Introduction

Sofia Municipality is committed to creating strong innovation eco-systems to transform the city of Sofia and surrounding communities into smart and sustainable places where people enjoy living and working. To achieve these goals, concerted efforts and investments are needed not only from the city administration but also from key stakeholders and partners from the industry, research and academia, civil society organisations and citizens.

The ambition is to build Sofia as an innovative city that employs digital technologies, policy and financial instruments to improve the efficiency of urban operations and public services, the economic, social, and cultural environment, citizen well-being and quality of life, while ensuring that the needs of present and future generations are met in an equitable manner.

These objectives are defined in key strategic documents of the city, namely, the *Innovation Strategy for Smart Specialisation of Sofia*,[8] *the Strategy for Digital Transformation of Sofia*[9] (adopted in 2020), *Sofia Youth Strategy 2017-2027*[10], and *the Vision for Sofia 2050*,[11] which outlines the priorities for the development of Sofia and its suburban areas until 2050.

The four policy areas, chosen by the Sofia Municipality for the RRI-LEADERS project are fully in line with these strategic documents. The policy areas include: 1) support for innovations, 2) digital transition and new skills, 3) youth employment and entrepreneurship, and 4) sustainable urban development.

This report completes the preparatory mapping of the territorial context regarding the embeddedness of the RRI keys in policy and strategic framework documents at Sofia Municipality. It supplements the findings from task 2.1 with an analysis of relevant national and municipal documents, and the inputs from a participatory workshop with experts from all stakeholder groups. The workshop participants discussed opportunities for integrating RRI-AIRR approach in the four policy areas for Sofia Municipality: 1) support for innovations, 2) digital transition and new skills, 3) youth employment and entrepreneurship, and 4) sustainable urban development.

The aim of the report is to establish the extent to which long-term strategic planning in Sofia Municipality supports a self-sustaining R&I ecosystem, characterised by a high degree of openness and responsiveness to local needs, an inclusive approach towards all stakeholders, ongoing assessment, and monitoring for quality assurance of the policy and practical measures being undertaken.

The report highlights important differences in the four policy areas, which can be put down to both internal drivers of change (i.e., the appointment of a deputy mayor for digitalisation), as well as external factors, such

[8] https://www.sofia.bg/documents/20182/448750/ISIS_Sofia.pdf/f51fcd5a-2973-4679-89fe-62b3dccb6662 (in Bulgarian)
[9] https://innovativesofia.bg/en/strategies-and-policies/
[10] https://www.sofia.bg/documents/20182/448750/Strategy_young_people-SO-2017-2027.pdf/8186ee54-8135-42e0-bfa2-17dd2b281742 (in Bulgarian)
[11] https://vizia.sofia.bg/vision-sofia-2050/

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as the new national political and policy priorities, ESIF funding mechanisms, etc. The report concludes that policy-specific objectives in the said policy areas need to be better aligned with overarching priorities for long-term urban development. The RRI-AIRR approach is largely embedded in the reviewed documents even though it is not explicitly described as a leading approach for strategy development, implementation, and evaluation.

The following **national-level documents** are examined:

- National Plan for Development of the Open Science Initiative in the Republic of Bulgaria.
- National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017-2030.
- National Roadmap for Research Infrastructure 2017-2023.
- Innovation Strategy for Smart Specialisation.
- Strategy for Effective Implementation of Information and Communication Technologies in Education and Science in the Republic of Bulgaria (2014-2020).
- Act on Development of the Academic Staff in the Republic of Bulgaria.
- Scientific Research Promotion Act.
- Higher Education Act.
- Law on Equality between Women and Men.
- Law for Protection against Discrimination.

The following **municipal documents** are reviewed:

- Innovation Strategy for Smart Specialisation of Sofia.
- Digital Transformation Strategy for Sofia.
- Sofia Youth Strategy 2017-2027.
- Vision for Sofia 2050.
- Programme for Sofia 2021-2027.

3.2 Documentary Analysis of National Strategic Documents

RRI keys and AIRR dimensions reflected in the National Plan for Development of the Open Science Initiative: Open Access, Inclusiveness

The *National Plan for Development of the Open Science Initiative in the Republic of Bulgaria*[12] was approved by the Ministry of Education and Science in December 2020 and became effective in January 2021. All participants in the national research ecosystem are required to implement the priorities and objectives of the Plan. The Plan sets out the strategic goals, the necessary steps and tools for making open science a standard research-conducting practice in Bulgaria. The envisaged measures include the active involvement of the Bulgarian scientific community and the research-funding organisations in self-archiving in digital repositories and distribution/communication of research findings; development of the Bulgarian Portal for Open Science (https://bpos.bg); creation of new institutional repositories for data and publications in line with the FAIR principles; and connection of Bulgarian resources with the European cloud for open science. The main aim of the Open Science Initiative is to enable the access of Bulgarian researchers and the society

[12] https://www.mon.bg/upload/24848/plan-otvorena-nauka_130121.pdf

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to scientific publications reviewed by independent experts, reliable research data and results in an open and non-discriminatory manner at the earliest possible stage of dissemination, as well as to provide an opportunity for their use and reuse. The open access will further improve the transparency and accountability of public funding for research in Bulgaria.

One of the main objectives of the Plan is development of the Bulgarian Portal (Cloud) for Open Science (BPOS) as a building block of the Open Science Initiative. The BPOS will coordinate the dissemination of open-access scientific results from publicly-funded research and enable fast and easy sharing of publications and other digital research outputs, thus strengthening the communication and collaboration between scientists.

RRI keys and AIRR dimensions reflected in the National Strategy for Development of Scientific Research: Ethics, Open Access, Gender Equality, Inclusiveness

The *National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017-2030*[13] was launched in June 2017. Its main objectives are to transform Bulgaria into an attractive centre for cutting-edge scientific research and development of new technologies, to motivate young scientists to remain in the country, to increase the responsibility of Bulgarian science towards the society and vice versa, and to guarantee large-scale, fast, and long-term development and modernisation of the research system. The Strategy envisages three stages for the development of the Bulgarian research system: recovery stage (2017-2022), stage of accelerated development (2023-2026), and stage of research on a global level (2027-2030).

The Strategy does not refer to RRI framework but pays attention to the issue of the social impact of scientific research, which is related to the RRI principles. It highlights that scientific research needs to be beneficial for the society. It also includes specific measures aiming at science education for society, and the application of the open science principles. The Strategy has an objective to increase the number of researchers to typical for the EU levels and achieve a balanced distribution by age, gender, scientific areas, and geographical regions. While the intention to achieve gender balance and attract young scientists is clearly expressed, other diversity aspects such as increasing the participation of underrepresented groups (ethnic and religious minorities, people with disabilities, immigrants) are absent.

The Strategy encourages dialogue among academic circles, society, and business for achieving and maintaining the high quality of research, developing new research areas, and improving the quality of life. This is to be achieved through integration of the components of the knowledge triangle (education-science-business) as a basis for development of the knowledge-based economy and attaining sustainable, intelligent growth.

The Strategy intends to restore confidence in the research system through openness and transparency in all actions and procedures in accordance with common European standards and best practices. Measures to this end include declaration of potential conflicts of interest, publicity of research findings and accountability to society.

[13] https://www.mon.bg/upload/6527/SStrategy_2030_BG.pdf

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RRI keys and AIRR dimensions reflected in the National Roadmap for Research Infrastructure: Open Access, Inclusiveness

The major policy instrument for the implementation of the National Strategy for Development of Scientific Research is the *National Roadmap for Research Infrastructure 2020-2027*[14] (developed by the Ministry of Education and Science, the latest update published in 2020). The Roadmap presents the state of the national research infrastructures and provides a mid-term strategy for integrating them with the Pan-European research infrastructure. All research infrastructure complexes included in the National Roadmap are entitled to state funding (23 research infrastructure objects are financially supported in 2017-2023 period). The Roadmap is regularly revised and updated (first published in 2010, updates in 2014, 2017 and 2020), and the research activity of research infrastructure complexes is evaluated every two years by an international peer review panel. The assessment criteria, which include elements of RRI-AIRR approach are the access policy and data management plan (transparent policy for access to the infrastructure, including international access activities, conditions for provision of access, and data management issues), relations between partners of the infrastructure and its integration in the international research infrastructure.

RRI keys and AIRR dimensions reflected in the Innovation Strategy for Smart Specialisation: Public Engagement, Inclusiveness, Responsiveness, Reflexivity

The *Innovation Strategy for Smart Specialisation* (IS3) was initially adopted in 2014 and updated consecutively in 2015, 2017 and 2018.[15] IS3 analyses the capacity for innovation and research performance in Bulgaria, identifies priority areas for enhancement of the competitiveness of the Bulgarian RDI system and describes the aims, the thematic areas, and basic activities to be supported by the Strategy. The document contains a financial plan for its implementation, which outlines the policies, policy instruments and main funding sources. The IS3 aims at resolving some of the main long-term obstacles faced by the national research and innovation system, such as the lack of sufficient funding for R&D and the weak link between business and science.

The development of IS3 was a good example of employing the principles of public engagement and inclusiveness. Consultations with participation of important stakeholders from academia, business, territorial governments, NGOs, and experts were held in all six Bulgarian regions (NUTSII level), and their input was used to finalise the document, which was then adopted by the Council of Ministers and the National Parliament in fall 2017. The adoption of the IS3 contributed towards better efficiency of the utilisation of innovation and science policies and funding mechanisms with the establishment of the Council for Smart Growth. The Council coordinates policy implementation in the national innovation system (education, science, innovations, ICT) and the implementation of IS3. This step is clearly related to the principles of responsiveness and reflexivity.

[14] https://naukamon.eu/wp-content/uploads/2021/06/RoadMapBulgaria_2020-2027_EN-1.pdf
[15] https://www.mi.government.bg/files/useruploads/files/innovations/ris3_18.12.2018_bulgarian.pdf

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The Innovation Strategy for Smart Specialisation also tries to open up the innovation policy development process to diverse voices and combine the power of ideas and knowledge from different actors to co-create new products and find solutions to societal needs.

RRI keys and AIRR dimensions reflected in the Strategy for Effective Implementation of Information and Communication Technologies in Education and Science: Science Education, Open Access

Strategy for Effective Implementation of Information and Communication Technologies in Education and Science in the Republic of Bulgaria (2014-2020)[16] aims at modernisation of education, science, and innovation through the means of ICT. To this end, integrated digital governance should be introduced in all fields of education and science, resulting in automation of the administrative work of scholars and teachers, and development of publicly accessible and standardised electronic content. In this respect, the Strategy is linked to the science education and open access keys.

RRI keys and AIRR dimensions reflected in the Act on Development of the Academic Staff: Ethics, Responsiveness

The ethics aspects of RRI are most directly applied in the *Act on Development of the Academic Staff in the Republic of Bulgaria*,[17] adopted in 2010 and amended in May 2018. The most important ethics-related amendments proscribe the rules and terms for establishment and operation of the Academic Ethics Committee. The Committee, established by the Minister of Education and Science, shall examine "the alerts concerning violations in the procedures for awarding academic degrees or academic positions, as well as signals for plagiarism in the dissertation papers and the papers submitted for assessment, the lack of credence of the presented scientific data, and the conflict of interest in the forming of the scientific panels' membership" (Art. 30a).

The amendments that enabled the establishment of the Academic Ethics Committee represent an example of responsive and adaptive action of the Ministry of Education and Science, which reacted to several high-profile cases of academic dishonesty and took necessary measures to intervene appropriately in possible future cases.

RRI keys and AIRR dimensions reflected in the Scientific Research Promotion Act: Ethics, Open Access, Inclusiveness

The *Scientific Research Promotion Act*[18] requires ethical principles like honesty, reliability, respect, and accountability to be at the core of the ethical system of the national science policy. A desirable ethical practice is thus expected to frame issues in a fair or non-biased way as part of the public communication of science, and to ensure full transparency and accountability of research activities and research outcomes.

[16] https://www.strategy.bg/StrategicDocuments/View.aspx?Id=904
[17] https://www.mon.bg/upload/21464/act_on_development_acadStaff_022019.pdf
[18] https://www.fni.bg/sites/default/files/documents/6_2016/ZAKON%20ZA%20NASARChAVANE%20NA%20NAUChNITE%20IZSLEDVANIYA.pdf

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Art.3 of the Scientific Research Promotion Act reads: *"Research activity is based on principles of ethics, transparency, publicity, accessibility and applicability."*

The Scientific Research Promotion Act creates conditions for effective collaboration between science and industry through instruments for joint and integrated action. The document also stipulates financial support for research activities, which are aimed at establishment of structures that bridge the cooperation of universities, scientific organisations, and business.

RRI keys and AIRR dimensions reflected in the Higher Education Act: Ethics

The *Higher Education Act*[19] (promulgated in 1995) also addresses the ethical issues. While Art.55, par.3, reads that *"Members of the academic staff in higher education institutions have the right to freely conduct, according to their interest, scientific research and to publish the results from their work",* Art.56, par.1, item 2 puts forth certain ethical boundaries to this research freedom, by requiring the academic staff to *"observe scientific and professional ethics."*

RRI keys and AIRR dimensions reflected in the Law on Equal Opportunities for Women and Men and the Law for Protection against Discrimination: Gender Equality

Law on Equal Opportunities for Women and Men[20] defines the national policy on gender equality as based on the principles of equal opportunities in all spheres of public, economic, and political life, and balanced representation of both genders on all levels. Gender equality is also addressed in the *Law for Protection against Discrimination*,[21] promulgated in 2005, which prohibits any form of discrimination based on gender, among other grounds (Art.4), and obliges the employers to give preferences to perform a given job or occupy a given position to persons of a less represented gender or ethnic group (Art. 24).

3.3 Documentary Analysis of Municipal Strategic Documents

a) **RRI keys and AIRR dimensions reflected in Policy Area "Digital Transition and New Skills": Public Engagement, Science Education, Open Data, Inclusiveness, Responsive and Accountable Governance**

Sofia Municipality adopted its first digital transition strategy in 2020. The *Digital Transformation Strategy for Sofia* (DTSS)[22] is the result of Sofia's participation in the Digital Cities Challenge (2018-2019), an initiative of the European Commission (EC) that aims to help cities in the EU achieve sustainable economic growth through the introduction and use of high technology in all aspects of public life. In January 2020, the municipal council voted the creation of a new department for Digitalisation, Innovation and Economic

[19] http://lll.mon.bg/uploaded_files/zkn_visseto_obr_01.03.2016_EN.pdf
[20] https://www.lex.bg/bg/laws/ldoc/2136803101
[21] https://www.legislationline.org/documents/id/20676
[22] https://innovativesofia.bg/en/strategies-and-policies/

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Development, headed by a Deputy Mayor, which is tasked with the management, implementation and monitoring of the DTSS.

The vision of DTSS reads as follows: "Sofia systematically achieves sustainable economic growth and develops a high value-added economy through the introduction and use of high technology in all areas of public and economic life. Sofia develops as an innovative, intelligent, modern, progressive and high-tech city, an attractive centre and a preferred place for living, business and R&D. To achieve this, the city actively interacts and develops solutions together with various stakeholders at local, national and international levels." DTSS steps upon the scope of digitalisation set forth by the Innovation Strategy for Smart Specialisation of Sofia (IS3), which provides guidance for the operational objectives identified in the DTSS.

A draft roadmap outlining particular projects that are to be implemented in the next three years is elaborated as part of the strategy. Among the topics addressed in the document is the development of an e-platform for schools which seeks to improve the electronic communication between teachers, parents, and students; the creation of a new digital platform for contracts and public tenders, aimed to improve the control over municipal public procurement; a platform for communication with citizens. DTSS also envisions the creation of a digital twin of the city, using real-time data to develop urban policies and a new integrated mobility platform. The strategy implementation relies on the participation of the business and citizens, Sofia Investment Agency, and local stakeholders.

RRI keys reflected in the DTSS

- **Public engagement:** DTSS calls for a participatory governance model, based on the alliance of many stakeholders. As stated in the document, since DTSS draws upon the IS3, which itself follows a Quintuple Helix model, "it is important to have all five stakeholder groups represented in the DTSS governance: industry, academia, administration, users (groups and organisations, representing the citizens), experts in sustainable development of the environment and use of natural resources" (DTSS, 30). Stakeholder and user engagement are a critical part of DTSS implementation and includes information exchange and communication; engagement / participation / collaboration / (co)-production; participatory decision-making; and open governance. Key stakeholders relevant to the domains of the DTSS involved in its implementation are representatives of the start-up ecosystem, government, utilities and transport, through an advisory board and/or working groups coordinated by the Digitalisation, Innovation and Economic Development department (Innovative Sofia) of the municipality.
- **Science education**: Operational objective OO3.5 specifically aims to encourage university education that develops the fields of science, technology, engineering and mathematics (STEM), interdisciplinary engineering and informatics, as well as entrepreneurship.
- **Open data, access to data and open-source software** are listed as prerequisites for the implementation of the DTSS.

AIRR dimensions reflected in the DTSS

To ensure wide **stakeholder engagement, inclusiveness, responsive and accountable governance**, a special advisory council to the Deputy Mayor for Digitalisation, Innovation and Economic Development was

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established, the so-called Digital Board (DTSS, 31). DTSS states that user engagement, implementation of participatory models of governance, creation of collaborative ecosystems, and optimisation of user behaviour are the real objectives of technologies, **Open Data** management and digital transition in Sofia Municipality.

Recommendations regarding the inclusion of RRI and AIRR in the policy area "Digital Transition and New Skills"

1. Include gender dimensions/gender equality linked to digital transition, transformative technologies, digitalisation; DTSS currently does not mention gender and has no specific measures for promoting **Gender Equality**.
2. No considerations of **Ethics**, including research ethics and ethical issues linked to digital transition are mentioned; ethical issues (also linked to use of AI, public e-services, etc.) are critical for a just digital transition and provide an overarching framework for broad stakeholder engagement in the development and implementation of the strategy.
3. More detailed measures related to AIRR, in particular, **Anticipatory Governance**, **Inclusiveness** (also as linked to gender equality) should be included.

b) **RRI keys and AIRR dimensions reflected in Policy Area "Support for Innovation": Public Engagement, Open Access, Ethics, Anticipatory Governance**

The *Innovation Strategy for Smart Specialisation of Sofia* (IS3)[23] aims at adapting the national specialisation strategy of Bulgaria to the economic and social dynamics of Sofia and the establishment of Sofia as a Smart City. IS3 supports the corporate sector by stimulating the creation of better conditions for synergy and partnership in the innovation ecosystem and by the effective use of ICT. The IS3 objectives focus on (a) capacity building and market access, including support for building a centre of excellence in both the ICT and the creative industries; attracting leading investors to invest in R&D; development of ICT scientific and innovation infrastructure; effective implementation of ICT products in all spheres of social and economic life; promotion of international collaboration through attracting doctoral students from outside of EU; organisation of international conferences and forums, and (b) financial capital, establishment of new mechanisms for incubation and financing (particularly in the early stages), and facilitating foreign investments and venture capital opportunities in Sofia. The Strategy was adopted by the Municipal Council in 2016.

The policy aims to strengthen **the innovation ecosystem in the city and the region**. Two thematic areas for smart specialisation are in focus, which are also part of the national IS3, namely: **Informatics and ICT, and New technologies in the creative and recreative industries** (IS3, 5). The document identifies as main components of the innovation ecosystem in Sofia human capital, saturation and access to the market,

[23] https://www.sofia.bg/documents/20182/448750/ISIS_Sofia.pdf/f51fcd5a-2973-4679-89fe-62b3dccb6662 (in Bulgarian)

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financial capital, digital technologies, good regulatory environment, and good governance. Science education is strongly emphasised as key to cultivating highly skilled human capital.

RRI keys reflected in the IS3

The IS3 is based on a quintuple helix model. In the process of developing the ISSS of Sofia, the following guiding principles have been observed (IS3, 14-15):

- Integrated approach.
- Partnership and teamwork.
- Coherence and coordination.
- Publicity, transparency and citizen participation.
- Ethics, integrity and protection of public interest.

AIRR dimensions reflected in IS3

To achieve the goals and objectives of the strategy, Sofia plans to implement innovative and **user-oriented models of good governance** related to the provision of better, cheaper and time- and resources-saving services. Futuristic research - **forecasting future trends and developing scenarios for impact,** tracking the development of innovative technologies in the field of ICT, cultural and creative industries through partnerships among academic institutions, municipal administration, independent creative sector – are also set as goals.

Monitoring and evaluation are in the hands of a Monitoring Committee, which reports to the Mayor of Sofia Municipality (IS3, 53-56). The Committee is comprised of international and Bulgarian experts – researchers and entrepreneurs in the field of innovation, education, and science. The MC works in cooperation with the two consultative councils at the Mayor's Office: the Expert Council on Science, Technology and Innovation and the Advisory Council on Economic Policy and Finance. The MC has monitoring, and evaluation functions and oversees the IS3 implementation according to a set of performance indicators.

Action Plans for the IS3 are developed, which identify major partners, as well as sources of funding, deadlines, responsible persons, and an indicative budget for the strategy's implementation. Sofia Development Association is one of the parties responsible for the implementation of the annual IS3 action plans.

Recommendations regarding the inclusion of RRI and AIRR in the policy area "Support for Innovation"

The IS3 does not explicitly refer to questions of **gender equality, ethics/research ethics, responsibility**. This is considered a shortcoming and should be taken into account in drafting the annual action plans for the IS3 implementation in the next document revision cycle. Although not specifically mentioned, AIRR dimensions linked to **anticipatory, responsive, reflexive and accountable governance** are embedded in the document. It is recommended to redefine the ongoing implementation, monitoring and evaluation measures and the

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role of the Monitoring Committee in light of the AIRR dimensions; the key performance indicators could be revised to reflect more fully those principles as well.

c) RRI keys and AIRR dimensions reflected in Policy Area "Youth Employment and Entrepreneurship": Open Data, Public Engagement, Science Education, Inclusiveness, Reflexive and Accountable Governance

The *Sofia Youth Strategy 2017-2027* (SYS)[24] was adopted by the municipal council in 2016. The document promotes a vision of the city of Sofia as a modern European capital with a rich historical and cultural heritage, contemporary and dynamic cultural life, with a major role in the development of the region and the country. The Strategy calls for transforming Sofia into a city of the young, the active and the innovative. The main objectives of the SYS are to provide young people in Sofia with skills for lifelong learning, competences for development, prosperity and autonomy, and active social participation in the public decision-making process. SYS supports youth organisations, youth services and youth workers, as well as informal groupings of young people; and connects them with stakeholders to plan and implement activities and programmes that are relevant to the interests, needs and experiences of youth in Sofia.

RRI keys reflected in the SYS

The following principles, which are similar to the RRI keys, were followed in drafting the Strategy:

- Civic participation through a broad consultation process: all stakeholders have the opportunity to participate in the consultations on the preparation of the Strategy;
- Transparency: the opinions expressed by the participants in the consultations are publicly available, documented and archived;
- Expertise: the Strategy draws upon relevant research and analysis of local needs and international practices.

Three of the Strategy's operational objectives are linked to access to **Open Data, Inclusiveness and Engagement**, and **(Science) Education**. Operational objective 1.2 focuses on "Improving the access to information through digital technologies; improving access to open data and connectivity in public spaces; more active information policy towards young people from the municipal bodies." Objective 2.1 emphasises "continuing education and youth entrepreneurship, informal and non-formal learning; youth career development; youth innovations, youth social innovations."

AIRR dimensions reflected in the SYS

As concerns the AIRR dimensions, the following objectives and measures of SYS are relevant. Operational goal 1.1, Including young people in policy- and decision-making at local level, directly relates to **Inclusiveness and Responsive Governance.** The concrete measure for achieving the goal is the establishment of an

[24] https://www.sofia.bg/documents/20182/448750/Strategy_young_people-SO-2017-2027.pdf/8186ee54-8135-42e0-bfa2-17dd2b281742 (in Bulgarian)

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Advisory Council for Youth Policies with the Mayor of Sofia Municipality. The Council's role is to improve the institutional framework for the inclusion of young people in the policy-making process; strengthening the dialogue between Sofia municipality and local youth organisations in the implementation of sectoral policies; fostering partnerships, consultations, and dialogue with young people across the territory of the municipality. The Youth Advisory Council is tasked with the collection and analysis of information regarding the implementation of the municipal youth strategy. The Council holds joint sessions with municipal councillors and the city administration to discuss ideas and measures for the implementation of the municipal youth policies.

The SYS also supports **Self-Governance** of youth organisations and youth work, for example, Operational goal 1.3, Fostering youth activism – through youth self-governance, youth work, informal education, organisations of young people, inclusiveness, and promotion of democratic values. The main principles for implementation of the Youth Strategy include:

- Participation and inclusion of young people, including youth with fewer opportunities.
- Compliance with legislative and regulatory frameworks.
- Transparency.
- Equality.
- Multi-sectoral approach.

Reflexive and Accountable Governance: The Strategy implementation is assessed each year in an annual monitoring report.

Recommendations regarding the inclusion of RRI and AIRR in the policy area "Youth Employment and Entrepreneurship"

The SYS does not focus on **Gender Equality, Ethics, Responsibility, or Science Education**. These issues need to be reflected in a revised version of the SYS, also in light of new EU initiatives, such as the Next Generation EU.

d) **RRI keys and AIRR dimensions reflected in Policy Area "Sustainable Urban Development": Public Engagement, Open Access, Science Education, Ethics, Gender Balance, Inclusiveness, Anticipation, Transparent and Accountable Governance**

Vision for Sofia 2050[25] is an initiative of Sofia Municipality to create a shared and long-term strategy for the development of the capital and suburban areas until 2050. During 2016 and 2017 many public discussions were held, with representatives of political parties, non-governmental organisations, businesses, entrepreneurs, researchers and citizens. At the end of 2019, the final version of the *Vision* was elaborated, proposing 24 long-term goals, nearly 250 steps and 385 specific measures, which have the ambition to make Sofia a better city to live. The *Vision* was developed by SofiaPlan, a municipal unit tasked with research, analysis, and development of long-term spatial and strategic planning for sustainable urban development

[25] https://vizia.sofia.bg/vision-sofia-2050/

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(SofiaPlan is included in the list of good practices from Sofia, see *Mapping report for Sofia and stakeholder profiles).*

Programme for Sofia is the main document which will translate the broader framework of the *Vision* into an Integrated Municipal Development Plan 2021-2027. The strategic document will define the medium-term goals and priorities for the city's future. As with the *Vision*, the *Programme* is based on a comprehensive analysis of multiple aspects of urban development (economy, demographic profile, metropolitan area and neighbouring cities; housing, public utilities and services; energy; transport; healthcare; education, culture and cultural heritage; social services; ecology and environment). The *Programme* is a continuation of the Municipal Development Plan (MDP) and the Integrated Plan for Urban Reconstruction and Development (IPGVR) of Sofia Municipality for the period 2014-2020. The new *Programme* was prepared in accordance with the requirements of the Regional Development Act (RDA), the Regulations for its implementation (RDPR) and the Methodological guidelines for development and implementation of integrated development plans of the municipality for the period 2021-2027, approved by the Ministry of Regional Development and Public Works. The Programme for Sofia is expected to be voted by the Municipal Council by the end of 2021.

The priorities of the *Programme* derive from the *Vision* and are in line with current European, national and local strategic documents. The following strategic goal for the development of the city is set: Sofia Municipality is a more adaptable, sustainable, inclusive and diverse municipality, focused on the knowledge economy and offering a better quality of life in a cleaner environment. Three strategic goals are defined, which outline the main perspectives for urban development, covering five main priorities for financial investments and use of resources; as well as 14 specific objectives. **They cover all five of the RRI keys and most of the AIRR dimensions.**

Strategic goal 1: More sustainable development and improved connectivity.

The strategic goal focuses on the sustainable development of the municipality and the opportunities for improving its connectivity and technical infrastructure through environmentally friendly, intelligent and cost-effective solutions. It integrates policies in the environmental, economic and technical infrastructure sectors, and complementary activities supporting their implementation.

Strategic goal 2: Increasing the competitiveness of the municipality and developing the knowledge economy.

The goal focuses on the development of a more competitive local economy based on innovation, increased efficiency of SMEs and a sustainable increase in the share of employment in sectors with high added value and export potential. **This goal focuses also on the optimisation and reorganisation of the administrative processes in the municipality, in order to improve strategic planning, development and social inclusion** (in line with the main AIRR principles).

Special attention is paid to education, as a means to decreasing social inequalities, facilitating individual professional and personal realisation, and increasing of the quality of life. The main thematic areas that fall into the focus of action are:

- support for innovation;
- attracting investment and new jobs in high value-added sectors;
- strengthening cooperation between science and business;

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- accelerating digitisation;
- transformation of city administrative processes;
- introduction of shared administrative e-services;
- improved opportunities for professional qualification and retraining;
- lifelong learning and adult literacy.

Strategic goal 3: More developed social and cultural environment.

The strategic goal focuses on the development of Sofia Municipality as a diverse, authentic, vital, social and inclusive community. Measures and activities are envisaged to ensure balanced territorial development while reducing social inequalities and improving the social inclusion of vulnerable groups and minorities. The strategic goal combines social, urban, cultural and economic policies in a coherent system, which aims in an integrated and sustainable way to permanently improve the quality of life in the city and municipality.

AIRR dimensions reflected in the Programme for Sofia

As mentioned above, the full cycle of developing first the *Vision for Sofia 2050* and now the *Programme for Sofia*, relies on broad **Public Engagement, Inclusiveness, Foresight Scenarios, Transparent and Accountable Governance.** The same principles are foundational also for the Programme's implementation, as can be seen from the draft versions of the document.

The *Programme* will be the main source for drafting the transformative outlook for Sofia.

3.4 Report from the Participatory Workshop in Sofia

The participatory workshop was held in Sofia on July 15, 2021, with 23 participants representing academia and research institutes, the private sector, civil society organisations and local authorities. The workshop started with an introduction to the findings from the fieldwork (interviews, focus group) conducted in the first semester of 2021 on the application of RRI-AIRR approach at municipal level, as well as from the documentary analysis of national and municipal documents and policies linked to the four policy areas, chosen by Sofia Municipality: sustainable urban development, digital transition and new skills, support for innovation, and youth employment and entrepreneurship. Following the initial discussions, participants were divided into four groups, corresponding to the four policy areas to discuss practices, opportunities, and ideas about the integration of RRI-AIRR approach in these policies.

Group 1: Policy area "Sustainable urban development".

Group 2: Policy area "Digital transition and new skills".

Group 3: Policy area "Support for innovation".

Group 4: Policy area "Youth employment and entrepreneurship".

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Discussions in each group were structured around a pre-defined questionnaire which included questions about the current status of municipal policy-making and integration of RRI keys; main actors/stakeholders which could positively influence the integration of RRI-AIRR approach in future policies; specific policy objectives/measures for the integration of RRI-AIRR approach in each policy area; general recommendations for future implementation of RRI-AIRR approach in territorial governance. The workshop concluded with a plenary session during which each group presented the main results of the group discussions. In what follows, the main points of the discussions per policy area are summarised.

1. Policy Area "Sustainable Urban Development"

Participants in this group discussed the barriers and drivers for integrating the RRI-AIRR approach in policies related to sustainable urban development. Besides the prevailing hierarchical top-down model of communication within the municipal administration and the administration and residents/stakeholders, participants noted as a barrier also an overall lack of understanding of innovation in municipal governance. According to them, there seems to be a certain fear and resistance in the administration with regard to (primarily) technological innovations in the organisation of work. Participants also agreed that at this point, the systematic integration of RRI-AIRR approach in municipal policies is promoted by individual experts rather than administrative units in the municipality.

With respect to **public engagement**, "more public events for idea generation / idea incubator on policy issues and urban development with mixed audiences" are needed. The constructive communication between the city, the local ecosystem and the citizens is crucial. Such collaboration between the Sofia municipality and the local stakeholders could work on a reciprocal basis – businesses and the local community could support initiatives of Sofia Municipality (SM), and vice versa – the municipality could be a partner in initiatives launched by the local innovation ecosystem.

On the issue of **data and open access**, the opinion was that there are problems both with data collection and the way data are processed and made accessible. Datasets are not regularly updated and access requires top-down authorisation, which prevents the coordination within the administrative units as well as between the city administration and external organisations (also such which could provide data to the municipality). The lack of reliable, well-structured, networked data makes difficult the process of setting realistic, achievable indicators for policy implementation.

Regarding the implementation of the **AIRR dimensions**, participants noted that the administration does not always succeed to communicate to the public the results and achievements of policy implementation. Furthermore, critical analysis of project results and lessons learned are not systematically taken up in self-assessment and review procedures. As one participant noted, the administration is yet to accept that "findings which show that society is not prepared for [public debate] on a certain topic or issue could be an important result for future policy-making."

In light of the above, the following proposals for improving the relations/cooperation between key actors and stakeholders were made:

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- encourage the municipal administration to seek external expertise and to cooperate with universities and research institutes. Universities and academia are recognised as important stakeholders with the capacity to influence the uptake of RRI and research results, which are relevant to policy-makers;
- introduce new procedures facilitating horizontal communication between stakeholders, actors and the municipality on matters of RRI in policy-making;
- provide support for applied research and policy-related studies to serve policy-making;
- improving the soft skills of the administration to navigate the terrain of RRI and to cooperate more effectively with academia, the private sector and civil society.

Participants also favoured a more active role of SofiaLab, which is a living urban lab for innovations, coordinated by Sofia Development Association. Initiatives of the Lab complement the activities of the Sandbox for Innovative Solutions of Innovative Sofia, part of the Plan for the Implementation of the Digital Transformation Strategy for Sofia. However, the operational and financial resources at municipal level are insufficient for expanding and building a complete infrastructure for a living laboratory, so it is key that different collaboration options are discussed with the local ecosystem and, possibly, with EU/international partners.

2. Policy Area "Youth Employment and Entrepreneurship"

Discussions in this group concluded that all RRI principles are relevant to the policies for supporting youth employment and entrepreneurship – especially public engagement, open access to information and transparency/accountability. Young people will respond to available programmes and opportunities if they have the information and are actively encouraged to take part. The current Strategy for Young People in Sofia Municipality 2017-2027 underlines the need to support youth employment and entrepreneurship in Sofia.

In terms of barriers to RRI, participants pointed out the lack of resources: funding and time.

The problems related to communication of science and scientific facts/findings/results are among the most important barriers. These problems have many aspects. One of them is that stakeholders speak different languages – scientists and researchers have their own professional jargon, the public administration uses bureaucratic language, and the society needs information presented in a popular and accessible vocabulary. This miscommunication creates distrust and scepticism.

A 2015-research revealed that in Bulgaria, the share of young people inclined to become entrepreneurs is twice smaller than in most of the EU countries. One of the reasons is the insufficient state support for young entrepreneurs and start-up companies. On the other hand, the education system also neglects the entrepreneurial and business skills and does not develop skills like critical thinking and resourcefulness. Another problem is the passivity of the young people which do not take initiative but prefer more traditional paths for career development.

Participants identified several groups which could influence the process of policy-making: young people themselves; student and consultative councils at universities and secondary schools; non-governmental organisations established by the young or working with topics important for the young people; business

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clusters and associations. Good examples of cooperation between stakeholder organisations and the municipality include the Advisory Council for Youth Policies at the Mayor's office; cooperation agreements of the University of National and World Economy with business organisations and clubs to provide training, internships and other opportunities to their students.

Strategic measures

Providing accurate and reliable information is crucial; the information also needs to be provided through multiple channels, so that it can reach wide and diverse audiences. It is also very important to properly "translate" the information and use the language and style appropriate for the different target audiences.

Communication and presentation of good practices and examples are very important for encouraging youth entrepreneurship. Successful entrepreneurs, who typically grab the media spotlight in Sofia/Bulgaria, are adult males, while female and young entrepreneurs, or entrepreneurs belonging to ethnic minorities, rarely attract media or public attention. Apart from the media, NGOs and municipal government could also do more to change this and showcase the good examples of young and female entrepreneurs.

In terms of concrete measures, the participants agreed that more meetings, events, and workshops have to be organised, gathering interested parties together – science, business and society. It was pointed out that financial support, e.g., through the Municipal Guarantee Fund for SMEs, is critical for promoting entrepreneurship and supporting the innovation ecosystem of Sofia. The Fund provides loan guarantees for SMEs who have an economically sound project but cannot secure sufficient bankable collateral. In 2018 the Fund launched a new guaranteed scheme – Financing Innovative Start-ups Programme. The Programme gives special benefits to projects of female entrepreneurs, as well as projects of persons up to 35 years and over 50 years of age.

Another possible way to support young entrepreneurs could be realised in cooperation with universities. Students could be given tasks such as developing business plans or designing urban development projects, which would earn them credits in their studies. Currently, internship opportunities in business companies are still relatively rare, and when they exist, they are not implemented in the best way that would use the potential of the young interns to the full.

3. Policy Area "Support for Innovation"

Discussions in this group overall confirmed the conclusions from the interviews and the focus group conducted in May 2021. Participants agreed that RRI-AIRR approach are not well integrated in current municipal policies. Policy- and decision-makers need to be more active and adopt the results of research and outputs of various projects, implemented by Sofia Municipality or in which the municipality has been a partner. Overall, initiatives in support of innovation (be it technological or social innovation) seem to be driven by external factors rather than the result of consistent efforts and long-term vision of the municipal government. The current innovation policy of Sofia Municipality is rather broadly formulated and more concrete objectives need to be set, in order to boost the innovation ecosystem and smart specialisation on the territory of Sofia.

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Participants in this group also emphasised the need to improve the communication between the municipality, citizens, academia and the business sector in the preparation and implementation of policies. Regarding academia, Sofia Municipality should support innovation through commissioned studies and research (the results of which can feed into municipal policies); public procurement procedures can be revised and adapted to include provisions in support of RRI, thus increasing the role of the municipality as both a leader and end user of scientific innovations.

The potential of citizen science is not fully exploited, although this could be a source of important data and expertise, as well to engage more groups in society in science education. Currently, many initiatives (in science education) take place at grassroots level but are not well communicated to the city administration and the opportunity to capitalise on the experience and outcomes is therefore missed. One example given in this respect concerns a project studying urban heat islands, implemented in cooperation with Sofia University; the results of the project could be very valuable for the municipal programme for climate change mitigation. Overall, the municipal administration is seen as having a leading role in providing a strategic framework for studies and research linked to urban development, as a source of funding for such research, as well as a key actor in enforcing the national and EU regulations and legislation in the field of innovation.

With respect to public engagement, participants noted that the interests of vulnerable groups and of people with disabilities are still not fully addressed in policymaking. Public consultations have to involve these groups to ensure that policy priorities respond to their needs and comply with EU regulations; for example, by 2022 all public services need to be adapted to the needs of people with hearing problems.

Whereas various initiatives are implemented to support technological innovations and start-ups, less attention is paid to innovations in the public sector. Innovation in the public sector comprises the integration of already implemented innovations or new knowledge to improve current or put into use new processes, services and practices, the goal and visible result of which is the improvement of public services and quality of life, or a main aspect of public services within the territory concerned.

Participants perceive the role of the Sofia Municipality as follows: as a contracting authority of innovation projects, as an initiator of innovation and as a policy-maker in support of innovation. Being innovator (public-sector innovations) in itself is considered as the main role of the Sofia Municipality because only then it will be able to develop and support the other two areas. Sofia Municipality should support local innovations where there is no funding from national operational programmes. To overcome piecemeal working, the participants believed RRI-AIRR approach could become an integrator and should be integrated at every level of governance within the Sofia Municipality.

In terms of concrete measures related to the policy area, the participants proposed the organisation of forums for promoting innovations, giving more visibility to pilot initiatives, and improving the communication and engagement with citizens, including through an online platform. This is considered an opportune time for launching such a platform since we are just at the beginning of the 2021-2027 programming period of the EU.

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4. Policy Area "Digital Transition and New Skills"

Similar to the discussions in the other groups, participants emphasised that a main objective of digital transition in the municipality should be to ensure that the needs of all citizens are considered, with special attention paid to people with disabilities. This concerns in particular e-services and access to those services; the municipal administration should plan and carry out information campaigns targeting citizens and people with special needs. In this respect, the municipality is encouraged to partner with organisations, representing the interests of these groups and to use their expertise in designing the services. Another recommendation was to revise the rules for public procurement and to include provisions that guarantee the needs of these groups are respected (when it comes to the design, implementation, and evaluation of public services).

In terms of the implementation of the new Digital Transition Strategy for Sofia (DTSS), approved by the municipal council in 2020, participants agreed that the new municipal department dedicated to Digitalisation, Innovation and Economic Development (Innovative Sofia) is a unit with strong expertise and has so far succeeded in accomplishing the objectives set in the DTSS. As potential risks participants noted the allocation of sufficient funds in the municipal budget needed for the implementation of DTSS; a long chain of decision-making and dependence on many units and administrations within the Sofia Municipality, which slows down the work. Lack of public awareness of the objectives of DTSS is another issue which calls for more active public information campaigns.

According to the participants, the city administration needs to become more responsive, to develop future scenarios linked to the impact of transformative technologies, and overall, to improve its capacity for anticipatory governance. With regard to public engagement and citizen participation, one of the proposals was for the creation of an integrated platform for citizen participation and communication, which includes digital tools and also enables data processing of information from citizens and/or businesses. Such a platform will boost the role of the city as a market creator for local companies.

Regarding data policy, data access and open data, discussions focused on the following points: in line with the DTSS, the city needs to prepare and implement a comprehensive data policy, with guidelines for standardisation, processing, sharing, and data security in the municipal administration. The policy should also include procedures for opening appropriate datasets and providing access for citizens and businesses to them. A data policy would allow for standardised dissemination of information and open data to the public as well as for internal data sharing amongst municipal departments.

As key actors for including the RRI-AIRR approach in policymaking, participants consider Sofia Municipality (the Innovative Sofia unit), representatives of the local ICT ecosystem, other municipal units, e.g. SofiaPlan as well as stakeholders from the local smart-city ecosystem, research/academia and businesses.

3.5 Summary remarks

Overall, discussions in the workshop groups confirm the conclusions drawn from the interviews, the first focus group and the analysis of the national and local policy documents (see above). The workshop participants agreed that the RRI keys and AIRR dimensions are largely known and followed by the municipal administration (in policymaking and policy implementation) even though they are not formally set in internal

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documents or procedural codes. Secondly, the participants also agreed that a systematic scientific and research approach in the policy-making process is currently missing (with a few exceptions).

In terms of open access to data, participants noted various administrative, technical, and organisational issues, including lack of standardised procedures for validating data supplied by citizens and external organisations. In principle, the current hierarchical model of governance and decision-making is an obstacle to a more effective communication and cooperation between the municipality and local stakeholders.

Regarding the process of intra-municipal communication and management, participants see the need for a process where "bottom-up initiatives and ideas of the administrative staff can more easily find their way to the leadership of the municipal department/city" to achieve a transparent, responsive and accountable governance. The municipal administration and leadership are to set an example by becoming "early adopters of research/innovation results regarding public administration innovations."

When it comes to public engagement and inclusion, the participants' opinions clustered around two main positions: first, there is need for more public discussions and dialogue between public bodies, the private sector and civil society in support of transparent policy-making, and second, more efforts are needed to give voice to all citizens, in particular to underrepresented groups and people with special needs. As a public service provider, the municipality needs to base its policies and actions on research and data coming from academia, research institutes and the business, to improve the access to public services for all residents. In this respect, workshop participants also noted that the procedures for public procurement at municipal level need to be reorganised to allow for better alignment with the principles of RRI-AIRR approach. In terms of monitoring policy implementation, participants argued that "social and economic impact policy assessment (besides ecological impact) for sustainable urban development" need to be introduced.

Finally, it was also proposed that the municipal administration adopt good practices from other countries, specifically aimed to improve the integration of RRI-AIRR approach in territorial governance.

3.6 Conclusions

As the analysis of documents and the feedback from participants in the project activities show, the framework of the RRI-AIRR approach is generally recognised as important in the policy- and decision-making process, even though it may not be formally described in operational guidelines and procedures. Some of the strategic documents and policies, at both the national and the municipal level, explicitly mention RRI keys such as public engagement, open access, and science education as necessary for policy implementation and evaluation; others do not refer to any of the RRI thematic keys and AIRR dimensions.

Overall, the current policy priorities and strategic goals set by the municipal administration in the reviewed policy areas (sustainable urban development, digital transition, youth employment and entrepreneurship, support for innovations) only partially reflect the RRI-AIRR approach. This conclusion was confirmed also in discussions during the participatory workshop. While correspondence to national and EU-level policy objectives is pursued, not much emphasis is placed on transforming territorial development through the sustained application of the RRI-AIRR approach at all stages of the policy-making cycle – from baseline analysis to implementation and impact assessment. These shortcomings in the policy-making process reflect

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deeper issues with the overall administrative set-up of the municipal departments, including inefficient communication and heavy decision-making procedures, which are not conducive to a comprehensive transformation in the leadership and governance models of the municipality. In this respect, the RRI-LEADERS project is a valuable opportunity to trigger much-needed change and to improve the administrative and institutional capacity of Sofia Municipality to deal with strategic risks and leverage emerging prospects for meeting urban development goals.

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Chapter 4: Territorial report of Thalwil Municipality

4.1 Introduction

The first part of this report is based on desk research and analysis of the existing policy documents at the national and municipal levels. The second part summarises the discussions held in the participatory workshop in July 2021.

Regarding implementation of the energy transition, Thalwil has no specific energy and climate concept. Instead, there are various concepts and plans, such as a municipal structure plan[26] and a municipal energy plan[27], which address individual policy aspects.

The report starts by providing an orientation on the city's current measures to reduce greenhouse gas emissions and energy consumption based on its municipal energy and guideline plans. These issues are evaluated in greater detail, among others in a catalogue of measures for the re-audit of the "Energiestadt Thalwil" label marking the city as a so-called "energy city"[28]. To account for different aspects of energy planning, some examples of the municipality's status quo in terms of planning are given in the following chapter (as of August 2021).

The report includes recommendations to local policy- and decision-makers on how to identify opportunities/policy areas for integration of the RRI-AIRR approach for future policymaking and the strategic development of the municipality.

The following **cantonal documents** are reviewed:

- **Cantonal structure plan of Zurich[29].**

The following **municipal documents** are reviewed:

- **Legislative goals of the Municipality of Thalwil[30]** (2018-2022).
- **Municipal structure plan** (28 October 2015).
- **Municipal energy plan** (2015, October).

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4.2 Documentary Analysis of Cantonal Strategic Documents

RRI keys and AIRR dimensions reflected in the cantonal structure plan: Open Access, Anticipatory Governance, Inclusiveness

The cantonal structure plan of Zurich (2019) defines the directions of spatial development, which the canton of Zurich wants to take and specifies minimum requirements for all structure plans of the cantonal municipalities. The document is drafted by the cantonal government and approved by the cantonal parliament. Once it has been approved by the federal government, the specifications of the cantonal structure plan of Zurich become binding for all municipal authorities. This strategic document covers the following areas: spatial concept, settlement, landscape, transportation, utilities, waste management, and public buildings and facilities. The cantonal structure plan contains binding specifications for the authorities at all levels of governance but is neither parcel-specific nor binding for landowners.

RRI keys reflected in the cantonal structure plan of Zurich

Open access: The aim is to make data available to users free of charge. According to the cantonal structure plan of Zurich, specific data and maps must be made available to the public. In addition, the spatial planning authorities make their own maps publicly available. The structure plan specifies a variety of data that can be accessed online via the GIS-SERVER[31]. Another example are the cycling and hiking paths. In the municipal structure plans, cycling, walking, riding, and hiking trails, in particular, must be defined, taking account of historical traffic routes.

An important instrument for promoting open access is the further development and expansion of the communications infrastructure. Communications systems should be further expanded. These include facilities in the telecommunications sector and other line and non-line data and message transmission systems (e.g., radio). They have to be coordinated with the needs in the individual areas and settlement development goals, and an area-wide basic supply must be guaranteed, in principle.

AIRR dimensions reflected in the cantonal structure plan

Anticipatory Governance: The cantonal structure plan of Zurich addresses guidelines and measures in the above-mentioned areas, on the one hand, based on future scenarios and the application of new technologies (for example, in the field of mobility or building insulation) and, on the other hand, against the background of a growing number of people with various needs related to energy consumption in the Canton of Zurich. Another indication of anticipatory governance is the assessment of risks in specific areas. Thus, in the area of settlement development, the document identifies some sources of potential disruption, such as floods or technical faults, and emphasises the coordination of settlement development and accident prevention. This way, costly, ecologically, and aesthetically unsatisfactory protective structures and object protection measures can be largely dispensed with.

Inclusiveness: The strategy document integrates the perspectives of a large number of societal stakeholders, such as, for example, in the area of non-motorised transportation. Since pedestrian and bicycle traffic rely

[31] The GIS-SERVER can be accessed via http://maps.zh.ch/?scale=336995&srid=2056&topic=KantRiZH&x=2692500&y=1252500.

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on safe and accessible connections, the strategy aims to promote a cohesive and continuous network of bike lanes with connections to public transport. In particular, the cantonal structure plan calls for a coordinated network of pedestrian and bicycle paths across municipalities, including historic transportation routes and wheelchair-accessible paths. Another example of inclusiveness can be found in the field of agriculture. The interests of farmers are to be protected and high demands are made on the balancing of interests in the context of the approval of planning measures affecting agricultural zones. To preserve agricultural land, high cantonal hurdles are set against the conversion of fertile land into building land. The cantonal structure plan presupposes the protection of certain interest groups from the point of view of the protection of the environment.

4.3 Documentary Analysis of Municipal Strategic Documents

The reduction of energy consumption is a goal firmly established in the Municipality of Thalwil and is being addressed with targeted measures. As part of the mission statement enshrined in the municipality's bylaws, sustainable development has become a key component of Thalwil's policies. Since 2010, the municipality has been listed as an "Energy City"[32], a title awarded by the European Energy Award Programme[33]. The "Energy City" label programme is a tool for communities, offering planning stability and assistance in the sustainable energy transformation process. The goals and measures for the energy transition and thus for the reduction of greenhouse gas emissions in Thalwil are set out in several documents at the municipal level. A selection of the most important documents is analysed in more detail below against the background of the policy framework of RRI.

(A) RRI keys and AIRR dimensions reflected in the Legislative Goals of the municipality in 2018-2022[34]: Science Education, Open Access, Responsive and Accountable Governance, Inclusiveness

At the end of September 2018, the municipal council, with the support of the heads of the municipal service centres[35], finalised a set of 12 legislative goals and priorities for the following four years that are set out in

[32] An Energy City is a municipality that is continuously committed to the efficient use of energy, climate protection, and renewable energies, as well as environmentally compatible mobility. The "Energy City" label is awarded every four years by the supporting association. Together with an accredited energy city consultant, an initial inventory with potential analysis is carried out. Based on this analysis, the municipality defines specific and customised energy and climate policy measures for the following four years through a programme of activities. Once 50 % of the possible measures have been implemented, the municipality can apply for a review by the independent label commission of the Energy City Association. For further explanation, please visit https://www.local-energy.swiss/dam/jcr:0b72fbeb-4b5f-4369-b884-d5b6a3c0d6b2/Einfuehrung_Label_Energiestadt__August_2016_.pdf

[33] Energy City Switzerland. Retrieved from https://energy-cities.eu/vision-mission/

[34] Legislaturziele 2018-2022. (2018, November). Retrieved from https://www.thalwil.ch/_docn/2311342/Legislaturziele_2018-_2022_Zusammenstellung_nach_Klausur_genehmigt.pdf

[35] Dienstleistungszentren (DLZ). For an overview of the Thalwil service centers and their scopes of responsibility, please visit https://www.thalwil.ch/departemente.

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this document. Legislative goals concern important strategic projects linked to overriding requirements that the municipality must fulfil (e.g., CO_2 reduction).

RRI keys reflected in the legislative goals of the municipality

Science Education: This is an important element of Thalwil's legislative goals, especially in terms of sustainability and the energy transition, a key policy focus area. The second legislative goal explicitly addresses the topic of further (sustainable) development and education of public employees (including administrative and janitorial staff), which makes this issue a core task of the administration by providing support and measures for implementation. To evaluate effectiveness, a survey tool is being employed to ensure continuous applied evaluation and suitable training opportunities. The next employee survey will be conducted in 2022.

Promoting the science education of children: The eighth legislative goal is the promotion of environmentally conscious and future-oriented thinking and acting in Thalwil's public school. In addition to sustainable development, environmental topics should be included in the curricula of all schools[36]. The municipality and its stakeholders (e.g., the infrastructure and society service centres (DLZ Bau, Energie und Umwelt and DLZ Gesellschaft), the energy officers, and Oekopolis[37]) must ensure that local and global environmental topics are covered in class. Furthermore, at all levels from kindergarten to 9th grade, environmental education is promoted by "PUSCH – Practical Environmental Protection"[38]. While completing their compulsory education, students are taught in an age-appropriate manner with sequences on waste and consumption, water and energy, and the climate.

Open Access: The third legislative goal reflects the need to simplify and increase digitalisation and in turn the accessibility of municipal administration data. To achieve this, new services have to be created and existing ones expanded. A strategy across municipalities needs to be explored to identify needs and develop measures and potential synergies for the implementation of new digital services.

AIRR principles reflected in the municipality's legislative goals

Responsive and Accountable Governance: Currently, two of the 12 legislative goals of the municipality for the 2018-2022 period are directly linked to sustainable development or the energy transition. Thus, local policies set the direction for the energy transition and regulate the implementation of measures at the municipal level. Furthermore, Article 8 of the legislative goals calls on schools to promote environmental awareness and future-oriented thinking. Article 10 is about the general reduction of greenhouse gas emissions, the continuous development of renewable energy implementation, and efforts to keep the "Energy City" label. Responsible for this are two municipal service centres: community (DLZ Gesellschaft) and construction, energy, and the environment (DLZ Bau, Energie und Umwelt). In terms of responsive and accountable governance, Thalwil began fostering sustainable development in different municipal areas as early as 1998 (e.g., in energy consumption and education). For the last 20 years, sustainability has become a key policy component, deeply anchored within the legislative goals of the municipality.

[36] The new curricula "Lehrplan21" embeds sustainable development as integrated part for both the primary and the secondary section of the Swiss school system.
[37] For more information about Oekopolis, visit https://www.oekopolis.ch.
[38] For more information about PUSCH, visit https://www.pusch.ch

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Inclusiveness: First and foremost, the development of a strategy document ensures the integration of the perspectives of a wide range of societal and political actors. On the one hand, all parties represented in the municipal council were involved in document development, as were the heads of the various service centres. On the other hand, in the various legislative goals for the implementation of certain issues and measures, the document calls on other actors, such as societal players or administration and industry players, to take an active role and provide support. For example, specific classes at Thalwil public school are supported by Oekopolis - an important societal player in the municipality.

Recommendations regarding the inclusion of RRI and AIRR

- More detailed measures and elements related to RRI keys, such as public engagement and gender equality, should be included.
- The legislative goals could be more directly linked to scientific sources to facilitate evaluation and reflection in order to expand **reflexive governance**. In addition, the Sustainability Steering Group - a strategic body that reviews key issues and projects for sustainability - could become involved in the implementation and review of legislative goals.

(B) RRI keys and AIRR dimensions reflected in the municipal structure plan (2015): Anticipatory Governance, Inclusiveness, Responsive and Accountable Governance

The municipal structure plan outlining particular projects to be implemented over the next decades must be developed further according to the strategy. The municipal structure plan of the municipality of Thalwil consists of several sub-structure plans: settlement, landscape, traffic, infrastructure, and public buildings & facilities. In it, Thalwil reaffirms its commitment to sustainability and seeks a balance between economic, ecological, and social aspects in its decisions. The municipal structure plan is a good, long-term management tool for the municipality. The municipal structure plan was first introduced in 1997 and is revised every 15 to 20 years. Usually, existing targets are further developed and where necessary, new targets are introduced. During implementation, it is a matter of working out options and realising sustainably justifiable solutions. Among the topics covered under the plan's sub-areas (e.g., building, mobility, and transportation planning) is the development of concrete strategies, taking into account economic and environmental sustainability.

AIRR principles reflected in the municipal structure plan

Anticipatory Governance: The municipal structure plan is determined by the municipal council and requires the approval of the cantonal department of planning. The structure plan serves to coordinate spatial activities within the municipality, as well as with neighbouring municipalities and the region. Current and planned projects are included in the municipal structure plan and coordinated with each other. The objectives of the municipal structure plan are binding for all authorities. The municipal council and the administration must adhere to the guidelines of the municipal structure plan within the scope of their discretion. The measures formulated in the document are approached, implemented, and periodically updated by the authorities in accordance with the instructions for action.

Based on current construction activity in Thalwil, a population growth of 6 % by about 1,100 inhabitants is expected by 2025 (18.500 as of 2019). The strategies addressed by the municipal structure plan have been

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developed against the backdrop of a growing population. Examining and developing future policies in the light of various disciplines and population trends is indicative of forward-looking governance. For example, the document identifies specific regions that are to be built up more densely in the future to preserve recreational areas in the community. Thus, the document examines and anticipates certain future scenarios considering a growing population.

Inclusiveness: Objectives and measures are formulated to ensure the integration and participation of the various stakeholders, such as local businesses and agriculture. The document therefore promotes concrete measures to support agricultural ventures in the municipality. The strategic document highlights the need to support and protect the livelihood of the local farming community. It encourages the production of local produce from an ecological point of view because agriculture makes a valuable contribution to the environmental education of the population of Thalwil.

Responsive and Accountable Governance: According to the municipal structure plan, there is limited scope for the creation of affordable housing. Opening the school facilities to the population and creating new open spaces in the settlement area will lead to an improvement in residents' quality of life. Care facilities for the sick and elderly are being further expanded.

To ensure ***Reflexive Governance*** *as well as* ***Responsive and Accountable Governance*** in the implementation of the municipal structure plan, a simple control system needs to be established, e.g., by monitoring a set of criteria.

Recommendations regarding the inclusion of RRI and AIRR

- More detailed measures related to RRI keys, especially public engagement, science education, and open data, should be included. However, with respect to the RRI thematic keys, further details and specific measures are presented below when describing the status quo of the implementation of the municipal energy plan.

(C) RRI keys and AIRR dimensions reflected in the Municipal Energy Plan (2015): Open Access, Public Engagement, Science Education, Responsive and Accountable Governance, Inclusiveness

The municipal energy plan analysed the local heat supply and the available energy potential. The energy targets were adapted to the current energy policy prerequisites and higher-level targets and supplemented with an actionable list of measures. The general goals are an economical and environmentally friendly heat supply for the local building stock, as well as a significant reduction of greenhouse gas emissions by an increased use of ambient heat and renewable energy. Thus, the main objective of the document is to explore Thalwil's thermal heat supply and associated CO_2 emissions. The municipal energy plan is based on the requirements of the Canton of Zurich energy policy[39] and on the guidelines of the above-mentioned "Energy

[39] The underlying assumptions are based on cantonal energy law (Art. 1 EnG, March 2011), which stipulates that CO_2 emissions from heat and power supply as well as mobility must be limited to 2.2 t per person by 2050. This target corresponds to the "Progress" scenario of the Energy 2050 vision for the Canton of Zurich. The corresponding interim target for 2035 is to reduce total CO_2 emissions to 3.5 t per person. Converted to the heat supply, this means that only about 1.4 t CO_2 per person may be emitted.

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City" label and was developed with the help of a group of energy experts representing the stakeholders in the areas of politics, society, research, and industry.

RRI keys reflected in the municipal energy plan

Open Access: Thalwil has a solar power cadastre[40], which surveys the suitability of individual roof surfaces and shows their potential for solar power. With an information campaign, among other things, it promotes the use of both solar energy and photovoltaic systems. Interested property owners receive advice and detailed support for corresponding projects, and the Thalwil promotion programme provides targeted information and motivation, all of which serves as a good example of open access.

Public Engagement: Various sections of the municipal energy plan suggest that feasibility studies should be conducted in cooperation with property owners. This could include topics such as the need for cooling (waste heat), choice of energy sources, optimal size for the first stage with expansion options, and economic viability. These studies should be based on scientific methods (in line with RRI key ethics) to provide information that will help community planning, in particular to develop measures that consider the needs and individual energy consumption of residents.

Science Education: The municipality plans to offer training courses to raise the awareness of janitorial and building maintenance staff and make building operations more sustainable. To develop a suitable training programme, employee interviews are conducted in a systematic way to identify the need for further training in energy management and conservation.

AIRR principles reflected in the municipal energy plan

Responsive and Accountable Governance: On the one hand, Thalwil's municipal energy plan makes concrete recommendations for measures such as the use of ambient heat, geothermal energy, solar energy and natural gas. On the other hand, it specifies concrete energy targets to be reached by further measures yet to be developed. Setting, implementing, and evaluating long-term goals that are supported by the entire community is a sign of responsive and accountable governance. Also, the municipality's energy plan of 2004 already went in that direction. The 2004 energy plan set ambitious targets concerning energy consumption (1990: 249 GWh per capita -> equivalent to 16 MWh per capita; 2015: 226 GWh per capita --> equivalent to 12.7 MWh/cap. The 2004 energy plan was revised in 2012 to align it with the current goals of the Swiss federal government and the Canton of Zurich. The municipal target is an energy reduction by 30 % and a reduction in the use of fossil fuels to 55 % by 2035 (municipal council resolution, 2014).

In general, Thalwil's municipal energy plan (2015) highlights the following status quo:

- The residential heating requirement per inhabitant in Thalwil is 6% above the national average due to an above-average, specific residential space requirement.
- The potential for energy savings through building renovations is high.

[40] For further explanations of the project, please visit https:// www.gis.thalwil.ch

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- The heating requirement per workplace is significantly below the national average (low proportion of manufacturing industry).
- Despite a good natural gas supply, 38% of the heat in Thalwil is still generated with heating oil.

Inclusiveness: The municipal energy plan explicitly establishes policies and guidelines to meet the energy consumption, heating, and cooling needs of various stakeholders, including residents and industry, and designates specific zones for this purpose.

4.4 Report from the Participatory Workshop in Thalwil

The participatory workshop was jointly organised by the Municipality of Thalwil and the Zurich University of Applied Sciences on 14 July 2021. The online event discussed the energy transition in Thalwil and the role of the RRI-AIRR approach in local policymaking. A total of fifteen stakeholders shared their knowledge about key areas of Thalwil's climate policy and also listened to a keynote speech on net-zero strategies of the neighbouring city of Zurich. They discussed the five thematic RRI keys and AIRR dimensions relevant to improving Thalwil's climate policy, as well as concrete measures that could be implemented to achieve the established municipal policy objectives. The half-day workshop yielded useful input on two of the most critical policy areas of Thalwil – mobility and buildings, both of which account for a large share of direct greenhouse gas emissions.

- **Methodology**

The workshop explored how territorial stakeholders perceive the municipality's responsibility with regard to research and innovation in the light of the five thematic RRI keys and four AIRR dimensions, and their relevance to policy development. Another goal of the workshop was to achieve a common understanding among participants about the benefits of the European Commission's RRI policy framework for the energy transition in Thalwil. A brief introduction on the objectives of the EU project RRI-LEADERS was followed by a keynote speech on the climate strategy of the nearby city of Zurich and a discussion round. Next, the objectives of Thalwil's energy transition were presented, as well as the policies currently being implemented. For this purpose, the workshop continued in two breakout rooms, with participants collaborating virtually on MIRO[41]. The first room discussed the RRI policy framework as it relates to mobility issues and their relevance to the energy transition, while the second group focused on energy issues related to buildings. Discussions in each group were structured around a pre-defined questionnaire, which included questions about the integration of RRI thematic keys and AIRR dimensions and the current state of municipal policymaking. Findings were summarised by the moderators of each group and presented to the participants in a plenary session.

- **Keynote speech**

The city of Zurich has a far-reaching influence, both politically and economically, on the surrounding municipalities, including Thalwil. Zurich has always been a forerunner in Swiss climate policy and is, therefore,

[41] MIRO is a virtual platform for collaboration and group work // miro.com

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of particular interest in the context of the energy transition in Thalwil. In line with the Paris Agreement, Zurich has taken several steps to reduce its carbon footprint. After a successful popular vote on the "2000-Watt-Gesellschaft"[42], the city's latest goal is a net-zero pledge, i.e., reducing all direct emissions within the city's borders by 2040. This represents approximately 25% of total greenhouse gas emissions in Zurich. Furthermore, Zurich has defined all the steps necessary to reach its ambitious goal – decarbonisation of its building stock and the entire public service vehicle fleet, 100% renewable energy generation, and the general reduction of indirect emissions from products and services. Besides this, the strategy also requires carbon sinks such as carbon capture and storage from waste incineration. Zurich estimates the cost of achieving net-zero by 2040 to be around 20% higher when compared to an investment baseline and expects benefits such as the creation of new jobs, local added value, technological advantages, and a better quality of life. The net-zero framework of the city of Zurich is fully in line with its municipal climate objectives.

- **RRI keys and AIRR dimensions**

The lively discussions in the breakout rooms demonstrated the significance of the RRI-AIRR approach in tackling the energy transition in Thalwil. Although the RRI framework was new to most of the participants, their responses to a series of RRI-related questions yielded valuable insights for moving the project forward. This includes the involvement of all stakeholder groups along the quadruple helix but also the consideration of specific group needs and interests. The discussions also showed that most RRI keys are considered beneficial for future action in the energy sector, i.e., mobility and housing.

Participants focused on the AIRR dimension **Inclusiveness**, in particular, perhaps because of the political landscape of Switzerland with its direct democratic system. Usually, the consensus of a majority is required for a political motion to be successful. Therefore, the inclusion of stakeholders at an early stage is almost a prerequisite for any form of political change. Furthermore, the approach of **Anticipatory Governance** characterises many proposed ideas and inputs. Municipalities are obliged to anticipate the impact of their policies and counteract adverse effects on society at an early stage. Except for **Gender Equality**, all thematic RRI keys were part of the discussions. As indicated by the interviews, the workshop seems to confirm the notion that gender issues are not relevant in Thalwil's energy transition. While participants did acknowledge the importance of gender equality for other policy fields when asked, they consistently found it to be irrelevant for this particular policy focus. **Open Access**, on the other hand was a recurring issue in all subtopics discussed. Some participants perceived the availability of information and existing tools and platforms as insufficient in some cases. Others pointed out that the problem is a lack of knowledge rather than a lack of information and that there is plenty of information available on topics surrounding the energy transition at the federal, cantonal, and municipal levels. While talking about open access, participants raised other concerns, such as changing laws and insufficient monitoring of energy data. It was proposed that the municipality should improve concerning the access to data by the community and the publication of key energy statistics. It was also felt that proper monitoring was needed for existing activities and goals to be more meaningful.

[42] The "2000-Watt-Gesellschaft" (2000-watt society) is a Swiss climate policy goal to reduce the per capita primary energy demand to 2000 watt of continuous power. Additionally, the concept includes net-zero and a fully renewable energy system by 2050.

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The above issues obviously require more scientific education to promote a broader discourse on the topic among the general population. Indeed, many participants felt that the topic has arrived in the mainstream media and is becoming increasingly important, yet misconceptions and outdated information continue to confuse people and influence their opinion of the benefits of renewable energy technologies. A more sceptical participant stated that the topic may simply be too complex for some. It was felt that **science education** should already start in elementary school, but that, at the same time, the municipality could also do a lot more. In this context, **Public Engagement** and the need for more awareness were brought up. Participants suggested a public information campaign to make existing tools and platforms more accessible and for demonstration systems to display renewable energy technologies. One participant remarked that the topic is of little concern to the broad public. **Ethics** was mentioned in connection with the social justice debate, and there was a dispute about the need for financial incentives, i.e., a carbon tax. Some participants regarded this as essential in order to further support renewable energy technologies, on the one hand, and to create incentives, on the other. Other participants were worried about increasing social segregation.

- **Breakout rooms**

The main part of the workshop was the interaction with participants by means of discussions in two breakout rooms. Each room covered a major policy area for the energy transition in Thalwil. The first room discussed mobility-related issues and the significance of mobility for the transition process. The other group focused on buildings-related energy topics. Discussions in each group were structured around questions about the pre-defined policy areas and about the integration of the RRI keys and AIRR dimensions[43]. Before starting the discussions on the specific policy topics, the moderators asked two introductory questions. The first question was about the perception of the term "energy transition", the second one about the expected benefits of the transition process for the municipality.

The following paragraphs summarise the discussions in the breakout rooms while indicating embedded elements of the RRI-AIRR approach as well as potential integration for the five thematic RRI keys and four AIRR dimensions.

- *Perception of the term "energy transition"*

The first introductory question aimed to show potential deviations from a shared understanding of the term "energy transition". While some participants perceived it as an excellent opportunity for the technological development of the municipality, including the expansion of digitalisation, others expressed concerns about social issues. Two participants mentioned a connection with the global climate system, i.e., climate protection and net-zero emissions. It was also proposed that the energy transition is all about renewable energy technologies (reduction or abandonment of fossil fuels, renewable heating, etc.). For one person, energy transition meant strengthening local value chains.

- *Benefits of energy transition for the Municipality of Thalwil*

[43] Since the RRI-AIRR framework is rather new to the Swiss policy landscape, it was particularly challenging to consider the RRI keys and dimensions while not becoming too theoretical in order not to confuse the participants. In the course of the workshop preparation phase, this issue was discussed several times. As a result, the RRI keys and dimensions were transcribed into a set of questions to be asked by the moderators during the breakout-room session. In this way, the RRI framework could be addressed adequately without compromising the nature of the workshop.

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The second introductory question was concerned with the expected benefits from the energy transition in Thalwil. Participants identified a broad spectrum of potential benefits linked to all sustainability pillars: technological (energy independence, a self-sufficient energy system, and a local heat and power supply), economic (job creation, the attractiveness of the location, and more innovation), social (less noise pollution and local added value), and ecological (better air quality, reduction of local emissions, and climate preservation).

- *Non-motorised transport*

Regarding non-motorised transport, various measures were discussed that related to bicycle traffic. To travel shorter distances, participants considered bicycles to be a good substitute for cars. In view of the rather hilly topography, the preferred choice is e-bikes, which are already popular in Thalwil. The municipality, it was felt, could promote cycling further through sharing concepts or the construction of additional cycling lanes and parking space. However, participants were divided as to whether this topic falls within the authority of the municipality or should be the domain of private companies. The group further discussed the establishment of car-free zones and restricted speed zones ("Tempo-30"[44]). The population of Thalwil had previously rejected a proposal calling for such a plan by means of a public referendum (indicating **Reflexive Governance**). One participant suggested temporary "Tempo-30" zones to apply at weekends only in order to convince the population of the many advantages of such a measure (reflecting **Responsive and Accountable Governance**). Participants next deliberated on how to encourage pedestrian mobility, and the construction of additional pavements was suggested. Urban planners were called on to consider the topography of the region and the different needs of various groups of residents, in particular elderly citizens struggling to cover longer distances (reflecting **Anticipatory Governance**). While the car is expected to remain important for many residents, new services could reduce the need to rely on it for everything and better support the specific needs of the elderly, people with disabilities, etc. (indicating a need to integrate **Inclusiveness** according to the AIRR dimensions).

- *E-mobility*

Participants agreed that e-mobility is an essential issue in the energy transition and that technological progress will naturally replace combustion engines. In Thalwil, e-mobility has been growing on an annual basis. Nevertheless, it was felt that the municipality should continue to support e-mobility in the future. A discussion followed on the extent to which the thematic key of public engagement plays an important role in integrating new technologies. Public engagement is about bringing together policymakers, industry and civil society organisations, as well as NGOs and citizens, to deliberate on matters of science and technology. The discussion showed that it is important to discuss the technological resources and the needs of the different stakeholders. Despite a growing number of public charging stations for electric cars, there is still a general lack of sufficient charging infrastructure. Furthermore, electric supply capacities are not sufficient in all parts of the municipality and thus new power lines may have to be constructed. In addition, participants thought the municipality might support drivers who do not have access to a private charging station (hinting at the AIRR dimension of **Inclusiveness**). The suggestion was made to successively replace all municipal vehicles by a fully electric fleet. With a view to future innovations and technological progress, projects that

[44] In residential areas of Swiss municipalities, the speed limit is usually 30 km/h (in so-called "encounter areas" even 20 km/h). Some cities, including Thalwil, have been calling for an extension of this speed limit within city limits.

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further develop autonomous driving should be promoted (**Anticipatory Governance**) - especially in the case of public transportation, where autonomous driving could really be a "game changer". With **Anticipatory Governance** as a leading principle, the community can better integrate and plan for technological innovations involving mobility and build costly infrastructure over time.

- *Energy efficiency*

Participants discussed the difficulties involved in making a building envelope more energy-efficient, such as long lifecycles for buildings, relatively high investments required, and lengthy payback periods, all of which decreases the attractiveness for investors. Therefore, homeowners must plan long-term measures and consider their real estate holistically, e.g., through consideration of full-cost accounting and lifecycle assessments (**Science Education**). One approach could be a mandatory renewal fund for homeowners (**Anticipatory Governance**). This would require regulatory changes at the cantonal level in order to be politically feasible (**Anticipatory Governance**). For energy-related restoration, professional energy consultants would be helpful (**Inclusiveness**). However, in some cases, this is not realistic, and a complete renovation turn might be more practical.

- *District heating*

Renewable district heating networks face several implementation challenges. Besides the high investments needed, they may lack the competitiveness of other heating solutions, be only suitable for dense settlement areas, and simultaneously require an increased number of connections. Some homeowners might be discouraged by the potential dependency on a contractor firm from joining a district heating network. Energy contractors need to increase their cost competitiveness and should consider the increasing demand for district cooling into their services. With several networks in place, district heating in Thalwil has some popularity but faces conflicts of interest with the revenue-generating communal gas business (A**nticipatory Governance**). Therefore, the municipality should communicate their gas strategy openly and consider future gas and district heating networks as a whole (**Transparency** and **Open Access**). Consumers need to be addressed at an early stage of a heating replacement process (**Anticipatory Governance**). At the same time, a healthy contracting environment should be established, where actual competition between the contractor firms would improve the market situation (**Inclusiveness**).

- *Boiler replacement*

Concerning the replacement of old, fossil-fuelled boilers, several issues were raised. Despite considerable progress, renewable heating systems, especially geothermal energy systems, can still be more expensive than conventional boilers. To compare different heating systems objectively, costs should be considered over their entire lifespan, including all capital and operational expenditures. The implementation of heat pumps may be hindered by complex approval procedures (**Responsive and Accountable Governance**) and, in some cases, heat pumps are simply not compatible with the pre-existing heating systems. Furthermore, unfounded scepticism about the effectiveness of heat pump technology still exists (**Science Education**). While energy consultants usually recommend renewable systems, heating installers may continue to advocate fossil fuel-based systems, whether out of habit, lack of technological competence (**Science Education**), or simply because of the much lower cost of traditional boilers. Participants agreed about the way renewable heating should be promoted. Besides providing more information for homeowners (**Open Access**) and making temporary heating systems available, financial incentives such as larger tax benefits and higher subsidies

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were suggested. Targeted information campaigns based on the Swiss heating cadastre[45] could attract homeowners who may be facing an imminent boiler replacement (**Public Engagement**). The gradual change from gas and oil heating to renewable systems, based on ambient heat or biomass, affects employees of all kinds. Therefore, it is crucial to address threats and opportunities associated with these changes in the heating sector (indicating the RRI key **Ethics**).

- *Photovoltaics*

Generally, participants were optimistic about the development of energy generation from photovoltaics (PV). However, many homeowners are still unaware that PV may be a viable option or sometimes even a real business case (**Science Education**). Many rooftops are only partially covered by PV to generate enough power for self-use. If they were fully covered, the surplus could be sold to neighbouring properties. One participant suggested that the ZEV concept [46] could be extended to a municipal level (**Anticipatory Governance**), a de-facto detachment from the monopoly of the regional energy supplier. However, the utility company's role was regarded as crucial for planning and constructing medium-size plants and acting as a general contractor (**Inclusiveness**). Other concepts, such as a self-construction cooperative, were mentioned (**Inclusiveness**). Generally, a PV plant is less complex than replacing a boiler, and information is readily available. With increasing PV capacity, PV compete with solar thermal heat for rooftop areas. It was felt that Thalwil should lead by example and support the construction of new PV plants on public buildings (**Responsive and Accountable Governance**). Furthermore, stronger collaboration between homeowners and investors was perceived as an enabling factor for a faster expansion of PV (**Public Engagement**).

4.5 Summary remarks

The participant workshop involved stakeholders from a wide range of the quadruple helix, to further elaborate on the impact of the RRI framework concerning the energy transition in Thalwil. Two breakout rooms covered key topics for policymaking in Thalwil: mobility and housing. Both sectors account for a large share of direct emissions and, therefore, their reduction pathways are important. Besides the discussion about actual reduction measures, the workshop explored the relevance of the RRI framework concerning the policy focus in great detail.

In summary, the results of the stakeholder workshop correspond largely with the findings from the interviews and the focus group. While the RRI framework was new to most stakeholders, the RRI keys and AIRR dimensions were considered important and relevant. Although not implemented in the municipal administration, many of the inherent principles and values of the RRI framework are expressed in current policymaking: RRI dimensions are an integral part of the municipal code, RRI keys accompany topics

[45] The Swiss heating cadastre aggregates nationally available heating parameters (e.g., fuel type, heating technology) on Swiss buildings.

[46] ZEV = "Zusammenschluss zum Eigenverbrauch" (merger for one's own use) allows homeowners to sell their surplus electricity to neighbouring homes, thus increasing the motivation to install larger PV plants. Usually, the surplus is sold to the local utility company at rather a low price. This is a win-win situation, as the investor receives a better return on his or her investment, while the neighbourhood profits from lower energy prices.

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surrounding the energy transition, and it is a fact that different stakeholder groups represent different intentions and interests.

While most RRI keys were recognised by the workshop participants as important, the top two were public engagement and science education - in particular the municipality's need to engage actively and vigorously in the climate debate to close the knowledge gap of residents in the light of the extensive information on renewable energy technologies available. The municipality was asked to make its data more transparent and open to the public, following the RRI principle of open access.

Given the policy focus, anticipatory governance and thus planning over long periods is a necessity. Furthermore, the municipality should lead by example, following an approach of responsive and accountable governance. Regarding further AIRR dimensions, the debate centred on the need for public involvement and inclusion. This approach of inclusive governance, as propagated by the RRI framework, has a long tradition in Switzerland. In a direct democratic state, inclusion and the need to convince the people have always been crucial for political success. When talking about specific measures for Thalwil, the need for a wide consensus is intuitive and was, therefore, apparent at all stages of the discussion. The RRI framework makes this intuitive approach a lot more tangible.

4.6 Conclusions

Sustainability and renewable energy have been on the political agenda of the Municipality of Thalwil for almost 20 years. With the policy focus to transition its energy system, Thalwil aims to reduce local greenhouse gas emissions substantially. This report analyses the integration of the RRI thematic keys and AIRR dimensions in relevant policy documents and explores the awareness for the RRI framework with a stakeholder workshop.

RRI keys and AIRR dimensions were found to be relevant for all analysed documents. Inclusiveness was the major AIRR principle reflected in all documents. This is not surprising, as the federalist system in Switzerland is centred around a political bottom-up approach, where issues are generally solved at the lowest level, i.e., the municipalities, whereby higher authorities, i.e., the federal government or the cantons, only define a political framework. Furthermore, both the cantonal and the municipal structure plan featured many aspects of anticipatory governance. This is rather evident, as spatial planning is usually done over long time periods. In regards of the RRI thematic keys, open access was a recurring theme.

Besides the municipal energy plan, which has a strong focus on renewable heating for the city's buildings, the "Energy City" label plays a key role in communal energy strategy. Cities bearing this international label are re-evaluated every four years regarding a wide range of energy policies in a total of six aspects: spatial energy planning, communal buildings and sites, waste disposal, mobility, internal organisation, and communication. These aspects are rated and show the progress over time. The two aspects with the most potential: mobility and housing are also the policy areas most promising in terms of the energy transition.

At the participatory workshop, various stakeholders discussed two crucial policy areas in Thalwil's energy transition: mobility and housing. While all RRI keys were recognised as relevant, public engagement and science education were found particularly important. Furthermore, most stakeholders emphasised the

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relevance of both inclusive and anticipatory governance, confirming the findings of the documentary analysis.

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Chapter 5: Territorial report of Sabadell City

5.1 Introduction

The following report provides an RRI-based overview of the relationships between and among Catalonia's stakeholders in the chosen policy areas for the city of Sabadell within the greater Catalonia context:

- Smart Specialisation in active ageing.
- Smart Specialisation in circular economy.
- Smart Specialisation in innovation in design.

The report is divided into two main parts. The first part is a desk-top research and analysis of territorial policy documents and initiatives. The second part includes the results of the participatory workshop organised by Promoció Econòmica de Sabadell (PES-SL) and Fundació Catalana per a la Recerca i la Innovació (FCRI) to explore how the territorial stakeholders perceive responsibility in research and innovation, as well as the RRI keys and AIRR dimensions and their relevance to the overall development policy of the territory in the region of Catalonia and in the city of Sabadell.

During the last years the Economic Development Agency of Sabadell Municipality has been engaged in the deployment of the Smart Specialisation Strategy in Sabadell city, not only through the participation in a Territorial Specialisation and Competitiveness Project (PECT), but also developing new projects focused on important industrial challenges like the Industrial Symbiosis. In this sense, our work at the RRI-LEADERS project will be framed by the implementation of Smart Specialisation Strategies (RIS3) in our municipality, to promote and strengthen the territorial innovation ecosystem, aiming at generating a policy change through the Transformative Outlook, a future-oriented action plan with strategies and measures for implementing the necessary changes to integrate RRI as a framework for addressing core policy priorities.

Thus, all the projects will be considered through the RRI prism, especially those which are more sensible to societal challenges, such as active aging programme, a circular economy lab and a final user design and prototyping lab.

This report´s purpose is to synthesise the main actions and policy directions with regard to integrating RRI in current R&D&I policies so as to help the understanding of how and where the Catalan actors' areas are – as a baseline – in constituting and shaping the territorial R&I ecosystem as the RRI-LEADERS project develops.

This report is divided in two sections: (i) the first one consists of a desk-top research and analysis of the existing policy documents in the region of Catalonia and in the City of Sabadell regarding the presence of the RRI thematic keys and AIRR dimensions in Smart Specialisation; (ii) the second one consists of the findings obtained during the Participatory Workshop with different territorial stakeholders about their perception of RRI in general terms and its keys and AIRR dimensions and their application to the territorial Smart Specialisation policies.

The identified and analysed policy documents involving Smart Specialisation issues were:

- Strategy for the Smart Specialisation of Catalonia (RIS3CAT).

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- Specialisation and Territorial Competitiveness Project "Vallès Industrial" (PECT Vallès Industrial).
- Project RELOS3: From Regional to Local: Successful deployment of the Smart Specialisation Strategies.
- Different past and current RRI initiatives and projects in the territory.

The findings were summarised in a specific document provided in advance to the participants of the Participatory Workshop and constituted the basis for the discussions held, summed up at the last part of the present report.

5.2 Documentary Analysis of Territorial Strategic Documents (region of Catalonia and the city of Sabadell)

RRI keys and AIRR dimensions reflected in the documents involving Smart Specialisation: Public Engagement, Open Access, Gender Balance, Science Education, Anticipation, Inclusiveness, Reflexivity, Responsiveness

- **Smart Specialisation in Catalonia (RIS3CAT)**

The European Commission requires Smart Specialisation to be the basis for investing in research and innovation, which are co-financed with European funds. The member states and regions have to detect their own potential and concentrate European funds in economic areas that truly have the capacity to transform their region.

Within this framework, the Catalan Government approved the Strategy for the Smart Specialisation of Catalonia[47] (RIS3CAT), aimed at ensuring that European Union co-financed research and innovation investments are turned into economic growth and jobs. As stated, in the website of Internal Market, Industry, Entrepreneurship and SMEs of the European Commission[48] "RIS3CAT defines the framework within which the Catalan Government establishes research and innovation (R&I) actions and programmes over the 2014-2020 period and provides support for the generation and development of innovative projects. Moreover, the Digital Strategy of Catalonia for 2020 establishes the framework for investment and action in the ICT field".

RIS3CAT establishes four strategic objectives:

- "To modernise the business fabric by improving the efficiency of production processes, internationalisation and the reorientation of consolidated sectors towards activities with greater added value.
- To promote new emerging economic activities through research and innovation to create and develop new market niches.

[47] http://catalunya2020.gencat.cat/web/.content/00_catalunya2020/Documents/angles/fitxers/pla-accio-ris3cat-2018-en.pdf

[48] Research and Innovation Strategy for the Smart Specialisation of Catalonia (RIS3CAT) - Internal Market, Industry, Entrepreneurship and SMEs - European Commission (europa.eu)

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- To consolidate Catalonia as a European knowledge hub and link technological and creative capacities to existing and emerging sectors in the territory.
- To improve the overall Catalan innovation system, increasing the competitiveness of companies and steering public policies towards promotion of innovation, internationalisation and entrepreneurship."

The areas of activity are[49]:

- Strategic sectors:
    - Agrofood industries
    - Energy and natural resources
    - Industrial systems
    - Design based industries
    - Sustainable mobility
    - Health industries
    - Experience-based industries
- New economic opportunities in emerging areas
- Transversal facilitating technologies:
    - ICT (with microelectronics and Nano electronics)
    - Nanotechnology
    - Photonics
    - Advanced materials
    - Biotechnology
    - Advanced manufacturing technologies
- Improvement of the innovation ecosystem and strengthening competitiveness.

RIS3CAT for the programming period 2021-2027 promotes shared research and innovation agendas that contribute to greening the economy, improving people's quality of life, enhancing the industrial transition, and transforming production and consumption models to make them more sustainable and inclusive[50].

[49] http://catalonia.com/newsletter_news/newsletter/issue6/ris3cat.jsp

[50] RIS3CAT 2021-2027 and transformative innovation policy – Tatiana Fernández and Alberto Pezzi – EAPC blog (gencat.cat)

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- **Smart Specialisation in Sabadell (PECT Vallès Industrial and RELOS3)**

Sabadell has a high potential for innovation and technological advancement owing to its important industrial fabric and business tradition, complemented by the presence of reference R&D institutions and universities and a strong business ecosystem and organisations[51].

The City Council has been a key agent in the promotion of local innovation, developing different innovation strategies and participating in several projects in this regard. It is also recognised as an innovation agent by the Government of Catalonia.

Sabadell City Council is now leading a project in the framework of the RIS3CAT instrument**: *Specialisation and Territorial Competitiveness Project "Vallès Industrial"* (PECT Vallès Industrial)**, which "aims to promote this territory as a reference in the specialisation domain of industrial systems and to become a centre for innovation and design in this field. To this end, the city council is collaborating with several agents from the local and regional innovation ecosystem, such as universities, business associations, technological centres and other municipalities.

The themes addressed by the project are:

- **Intelligent design** applied to industry, design and innovation applied to industrial and auxiliary SMEs. Construction of a centre for design and innovation.
- **Active ageing**: Improving the aging and health of the elderly population. Creation of a space and a methodology for capturing the needs of the population over 60 and transforming it into business opportunities.
- Boosting the **circular economy** in industrial systems:
    - Promote circular economy actions to improve the competitiveness of the business fabric of the territory.
    - Improve resource efficiency, reduce costs and promote synergies between companies through the exchange of materials, energy and water.

At the same time, Sabadell City Council leads a project in the framework of Interreg EU calls, "**RELOS3[52]: From Regional to Local: Successful deployment of the Smart Specialisation Strategies"** which seeks to implement regional Smart Specialisation Strategies (RIS3) in a local context by actively involving local authorities, innovation agents and companies. The local level is often overlooked, but it is crucial to involve local ecosystem in innovation strategies. Being part of RELOS3 Interreg Europe network has allowed Sabadell to identify good practices developed by other partners, which have been translated to the Catalan context:

- "Implementing the Entrepreneurial Discovery Process in practice": The Maltese GP shows how they modified their original RIS3, mostly a top-down approach, to one involving fourth helix representatives (government, academia, private and civil society). They set up structures and systems to stimulate, guide and drive the Entrepreneurial Discovery Process at national level

[51] RELOS3_ACTION_PLAN_SABADELL_eng_revisio_FINAL_DEF.pdf (interregeurope.eu)
[52] RELOS3 | Interreg Europe

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- "Multilevel Governance in RIS3 Basque Country": The Basque Country GP points to the importance of involving different departments of the regional government in the design and implementation of the RIS3. Moreover, it shows how the inclusion of the local scale in the RIS3 helps to reach agents that might otherwise be left out of the specialisation process (such as SMEs or small business associations). Finally, the Basque Country RIS3 features a key figure, the facilitators, agents that activate the collaboration process.

RELOS3 action plan has two goals:

- Firstly, to address issues of governance among the regional and local authorities currently involved in the deployment of the selected policy instrument.
- Secondly, to improve the participation of agents in the local (sub-regional) innovation ecosystems in the process of regional Smart Specialisation, improving the interplay between regional and local innovation processes.

The Plan identified four key challenges in the involvement of the local level in the RIS3 related to the identified weaknesses of the RIS3CAT policy instrument.

- The need to demonstrate the key role of the local level in the implementation of the RIS3.
- The analysis of the collaboration mechanisms between the different agents involved in the specialisation and innovation processes.
- How to involve R&D agents in local innovation ecosystems.
- How to engage regional and local administrations in order to recognise the potential of the local level in the RIS3.

In particular, the Plan pointed to specific improvement aspects identified in the RIS3CAT instrument (as shown in the table below extracted from it), which related to a) governance issues (among the managing agents of RIS3CAT project calls and the different developed instruments under which innovation-related projects are being implemented); b) to the sustainability of the cooperation of the triple and quadruple helix in innovation and specialisation projects, c) more specifically the participation of the private sector.

Table 2: Improvement aspects identified in the RIS3CAT instrument

General Local Level Involvement in RIS3	Quadruple Helix Sustainability	Private Sector Support Options for RIS3 Deployment
■ Involving local governments is always recommended, since they are close to their businesses and civil society. ■ Have good communication and dissemination involving all quadruple-helix	■ The role of facilitators is key for helping stakeholders to work together. Facilitators should be independent entities capable of connecting with each other the different quadruple-	■ Start-ups: give support to extend their knowledge base, realising the time they need to grow and succeed. ■ Critical to identify the most central node in target activity.

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stakeholders in the decision-making process (to develop programmes, tools, indicators). ■ Entities should be able to "say no" to projects emerging from the RIS3 strategy, when they do not match respective RIS3 key areas. ■ Flexibility should be provided for including "out of the box" initiatives. ■ Inter-departmental coordination among managing agents of projects calls is key for implementation.	helix agents, as well as facilitating/guiding collaborations. ■ Motivation is the only way to involve and innovate. The policy should integrate different challenges and interests. ■ The experimental design of public policies opens a dialogue with the city's needs and challenges. ■ The local level is where RIS3 is best at developing collaboration.	■ Large companies might want to work with start-ups and cooperate with them (in a stable framework). ■ Start-ups and entrepreneurs: how do we transform a person with an idea into an entrepreneur? ■ Training, planning, identifying the target consumer for each new product/service. ■ The public sector expects to reach a broad community of potential entrepreneurs. To do so, it must connect with existing initiatives and deploy a stable operating framework.

Based on these observations, a model for more efficient RIS3CAT governance and for improving the sustainability of quadruple-helix collaboration was developed, offering some space for a bit more integration of the RRI keys of public engagement and governance, in concrete:

- By involving a wider range of stakeholders.
- By improving the current knowledge and information exchanges amongst them.
- By reinforcing the engagement of other public administrations.
- By setting up and engaging the stakeholders in consultative mechanisms.
- By improving communication of the RIS3CAT's impacts on the local economy to create more opportunities for synergies between existing local projects and initiatives.

Nowadays, the ambition is to capitalise on the work already accomplished through both projects regarding smart specialisation in the territory, by leveraging the specific advantage of the local authority to address the existing challenges within its territory and act as a bridge between society and science. Likewise, to learn about and adopt methodologies to enable building stronger ties between societal challenges identified in the territory, and the way in which research and industry could give an answer to them. The quadruple helix approach would be reinforced and also the chances to speed up the process of territorial specialisation and thus achieve a positive impact in terms of economic development.

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RRI keys reflected in the documents involving Smart Specialisation

The spirit of RRI is deeply integrated in RIS3CAT and in Sabadell Smart Specialisation project RELOS3, following the EU policy developments. For instance, a special emphasis is given to the involvement of local authorities, social and innovation actors and companies in the planning and execution of Smart Specialisation activities and plans, creating common working arenas. However, as mentioned in the SeeRRI project report "Mapping RRI Dimensions and Sustainability into Regional Development Policies and Urban Planning Instruments," RRI practical implementation is problematic, due to the complexity of the concept itself and the lack of awareness on RRI among private companies, though they have undertaken activities compatible with RRI like sustainable innovation, participatory design, open innovation, stakeholder dialogues, scenario development, circular economy, etc.[53] In this sense, the RRI-LEADERS project will contribute to disseminating and creating awareness of the benefits of the RRI keys and AIRR dimensions in the territorial innovation policies, creating a solid ground for public administrations to implement them and raising awareness of its social and economic benefits.

RIS3CAT defines priorities in line with **RRI Governance**, **Public Engagement, Open Access** and sustainability. It foresees participation and quadruple-helix collaboration, to be put in place by instruments such as RIS3CAT Communities or Projects of Territorial Specialisation and Competitivity (PECT). Not only is the public sphere taking care of the RRI governance, but also cluster organisations and other local organisations, especially through the implementation of EU and non-EU projects focused on all RRI thematic keys, as well as through the establishment of institutional representatives for addressing gender equality, open access and ethics[54]. These last two, though, are still insufficiently included into regional development policies and urban planning instruments.

In our view, **Ethics and Open Access** RRI keys are not properly addressed in the Smart Specialisation in territorial development policies and other local planning. A possible reason is that ethics is taken for granted, only general allusions to its standards are present in policies, plans and activities in both public and private sectors, but in the latter, they are not developed as they should, except for those organisations dealing with matters affecting health, security, critical natural resources (e.g., water management), or controversial technologies (e.g., nanotechnology or GMOs). The good news is that during the last years efforts are being done to correct it thanks to the promotion by the EU of ethical standards.

Open access to publications, reports, normative documents, and public policies, for transparency's sake, has been facilitated by the generalisation of Internet and the legal obligation for transparency standards. Advances in this sense have been achieved, having nearly all the organisations' webpages dedicated to informing about them and in particular the public sector. In our opinion, the problem lies in the fact that there is an overdose of documentation to be published, which hinders their prioritisation, proper classification, and presentation in the best way possible. Citizens and firms alike often feel overwhelmed

53 https://www.researchgate.net/publication/343003661_Mapping_RRI_Dimensions_and_Sustainability_into_Regional_Development_Policies_and_Urban_Planning_Instruments, p. 2.

54 https://www.researchgate.net/publication/343003661_Mapping_RRI_Dimensions_and_Sustainability_into_Regional_Development_Policies_and_Urban_Planning_Instruments

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when searching for documentation, having to spend a lot of time in the process. On the other hand, open access is still a thorny issue, especially in the private sector, mainly for intellectual property considerations.

Lay citizens and all the relevant actors should participate in all the stages of the planning and implementation of development policies: elaboration, approval, implementation and assessment. Only in this way can the acceptability of the whole process be guaranteed, and useful results be obtained. Co-creation ensures the inclusion of different perspectives, reflecting the diversity which characterises the society.

Gender Equality is compulsory by law and has, in consequence, been fostered by all public powers in Catalonia. This is the best acknowledged RRI key in theory though in practice the decision and ruling bodies of the organisations are still mainly masculine and lack the necessary feminine contribution and views. In the coming years this will be the challenge to face.

Science Education is regarded important in the plans and in fact it is the other RRI key well addressed in policies and implemented by research centres and academia. However, no clear and common guidelines are provided to ensure it is implemented in the most profitable and innovative way. This key is left in the hands of individual research centres and academic institutions and often efforts are wasted in similar typology of activities, target groups and even timing. It would be opportune to establish a common ground and spaces for a close collaboration among the different stakeholders implementing science education, even co-working with students, teachers, and private companies in the design to satisfy their real needs and subsequently evaluate the results.

AIRR dimensions reflected in the documents involving Smart Specialisation

Regarding the AIRR dimensions they are incorporated in RIS3CAT in the following way:

- **Anticipation**: RIS3CAT marks the path towards the future R&D and innovation policy in the territory and anticipates the impacts of its actions.
- **Reflexivity**: RIS3CAT gives space for reflection on the impacts the proposed actions may cause and promotes multidisciplinary collaboration among territorial stakeholders.
- **Inclusiveness**: RIS3CAT emphasises the quadruple helix participation in the governance system.
- **Responsiveness**: The processes promoted by RIS3CAT can readapt their actions to address the needs and expectations of the stakeholders and the society to better respond to new developments arising during the process.[55]

- **Past and Present RRI Initiatives in Catalonia**

The following section presents an indicative range of RRI-related projects that have been carried out in Catalonia under the FP7 and H2020 Programmes. While certainly not exhaustive, it does reflect the extent of RRI-focused activities that have been carried out by the 12 public and private universities, research centres, public authorities, private sector, Catalan Clusters, etc. It shows the strong public-private cooperation, which is a strong element in the Catalan R&D ecosystem, revealing to what extent the triple helix system is

[55] https://seerri.eu/wp-content/uploads/2021/02/deliverable_maquetacion_V3.pdf

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consolidated structurally and where the RRI framework is still mostly a work-in-progress at the 4H level. In the sense of citizen's participation and co-creation, this is still rather under-developed, and even truer regards people's empowerment and participation in citizen science projects, despite the many successes below.

1. RRI-Tools[56]. A project led by the Fundació La Caixa and IRISCaixa, a health research institute jointly created with the Catalan Government. It brought together four foundations, ten science centres, four universities and research centres, a science shop, a chamber of commerce and a technological partner, plus six related European networks of the EU project (**Inclusiveness**).
2. IRISCaixa is also involved in the project LIVING INNOVATION[57] - Implementing RRI through co-creation of smart futures with industry and citizens, where major ICT industry leaders unite forces to co-create more responsible approaches to innovation (**Public Engagement**).
3. GRACE[58] (Grounding RRI Actions to Achieve Institutional Changes in European Research Funding and Performing Organisations), with AGAUR as Partner. The project's mission is "To develop a set of specific Grounding Actions in six research performing and funding organisations… These actions will be the basis for the development of a tailored 8-year RRI Roadmap within these organisations to ensure its sustainability and full implementation over the long-term."
4. HEIRRI[59] (Higher Education Institutions and Responsible Research and Innovation), with the Catalan network of universities as Partner (Associació Catalana d'Universitats Públiques, ACUP) has the objective of starting "The integration of RRI within the formal and informal education of future scientists, engineers and other professionals involved in the R&D&I process".
5. TRANSFORM[60] The aim of TRANSFORM is to contribute to Catalonia's transition to a more competitive, sustainable and inclusive economic model (focusing on waste management). The Catalan cluster is working towards transforming the projects from the triple to the quadruple helix, incorporating citizen science as a means of integrating RRI into Catalonia's RIS3CAT 2021-2027, its instruments and the actors of the Catalan R&I ecosystem. The pilot projects chosen by the Catalan cluster are already developing or planning to develop innovative participatory strategies. The Catalan cluster will deepen this perspective using two approaches:
    - Co-creation process of innovative citizen science tools: various agents of the quadruple helix will be involved in a co-creation process to generate innovative tools based on citizen science (**Science Education**, **Public Engagement**).
    - Citizen science to improve municipal waste selective collection: a citizen science process will be developed in order to contribute to the design and monitoring of innovative municipal waste selective collection systems (**Science Education**, **Public Engagement**).

[56] Home Page - RRI Tools (rri-tools.eu)
[57] Livin - Virtual Community Platform (living-innovation.net)
[58] Homepage – GRACE (grace-rri.eu)
[59] https://heirri.eu/
[60] citizen science Archives - TRANSFORM (transform-project.eu)

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TRANSFORM's co-design process was set up to start defining citizen science projects responding to the waste management challenges, always from the perspective of collaboration between Quadruple Helix agents, supported by the Catalan cluster.

On other major initiatives that involve RRI aspects in their work, two stand out as related to the three of the thematic focus in Sabadell and Catalonia in RRI-LEADERS:

1. The European EIT Health[61] project. In Catalonia, BIOCAT[62] has been promoting the EIT initiative since 2009 as an associate member. BIOCAT is also coordinating the RIS3CAT community: "NEXTHEALTH: Multidisciplinary solutions for the coming challenges in health" in order to tackle the main health-related challenges in Catalonia, from knowledge to market access, to "maximise the economic and social impact of the life sciences and healthcare innovation of the BioRegion", according to the website.
2. Circular Economy (Circular Catalonia: the Circular Economy Observatory[63]). According to its website, this is the "hub for innovation and a meeting point for companies and institutions that provide solutions and strategies to consolidate the circular economy in Catalonia".

Likewise, the Commission of Economy and Sustainability of the College of Economists of Catalonia, Promotion of National Work, PIMEC, the Chair of Circular Economy of the Tecnocampus Mataró-Maresme and the Department of Territory and Sustainability (DTES) of the Generalitat de Catalunya put together the 'Barometer of circular economy of the Catalan company' 2020. The barometer checked the extent of knowledge and implementation of the circular economy in Catalonian companies. The findings seem to indicate RRI-based opportunities for improvements.

The main results have been (and may give indications for "RRI-LEADERS" as to the situation in Catalonia):

- While 81% of companies surveyed are aware of the concept of circular economy, large companies consider it more urgent to start actions than smaller ones, and this seems linked to business strategy.
- In implementing the circular economy, most actions focus on recycling, improving the efficiency of the use of resources and in their recovery. More sophisticated initiatives related to remanufacturing are considered more difficult to achieve.
- Indicators to measure progress towards circularity and its benefits are still lacking.
- There is a strong conviction that to move to a circular economy requires investment. Almost half have obtained public aid for their projects but providing knowledge about available aid can be improved.
    - **Observations after conducting desk-top research and analysis**

It has been identified the importance of the fact that both public and relevant private territorial entities should have mapping methods, with indicators for RRI, benchmarks and maturity level in place, or in the making, for meaningful RRI-based transformative change in policy to come about.

[61] EIT Health | Promoting innovation in health
[62] Strategic projects | Biocat
[63] Catalunya Circular: l'Observatori d'Economia Circular. Departament de Territori i Sostenibilitat (gencat.cat)

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Regarding the indicators, those related to the Sustainable Development Goals of the United Nations (UNSDGs)[64] should be included as well since their importance was recognised by the stakeholders participating in the focus group of RRI-LEADERS task 2.1 and in the participatory workshop of task 2.2, including those amongst the private sector.

It seems that the importance of the "language" aspects (communication) is underestimated as public officials speak one language, and industry speaks another, Civil Society Organisations still another. RRI is difficult to translate and explain (especially when the RRI messaging comes from a researcher).

The Regional Operational Programme (ROP) does not foresee a procedure to link locally led projects (which can be smart specialisation focused as well) with "Communities" projects (R&D led and part of the ROPs), although communities are supposed to add high value to the smart specialisation ecosystem. Indeed, the RIS3 strategy made no specific reference to how sub-regional policies should be involved and aligned with it, so the City Council of Sabadell (in the RELOS3 initiative) has been investigating how other European regions and cities (if any) have implemented these coordinated strategies straddling the regional and the local. Sabadell is collecting procedures to improve collaboration among the stakeholders (specifically those regarding R&D areas such as technological centres, innovation units in universities, etc.), within its specialised ecosystem (meaning companies in the territory).

Catalonian initiatives appear no different from any other territory's in focusing on the early stages of technology design, for innovation (the "upstream" phase), while not focusing on the social impacts (the downstream" phase (Jenkins et al., 2020). Indeed, RRI mostly get spotlighted at the "emerging" and "novel" innovation phase but finds traction more difficult in discourse and deed once a new technology becomes "established".

Two other perhaps inter-connected "messaging" observations: On the one hand, as with probably other territories, there may be "techno-visionary discourse" that becomes predominant, and in a way, "elitist" which can inhibit lay citizens from joining in on the discussions about innovations and responsibilities.

On the other hand, there may be a combined - a) "fake news" discrediting science impact, where anyone with a Twitter account can opine; and b) RRI fatigue that universities or research centres are the main ones that should always be leading the RRI cause. Together, these speak to a broader "de-standardisation, fragmentation" of a science institution's internal workings and a society's willingness and/or capacity to absorb science's findings and insights in ways that serve societal needs and expectations.

According to the valuable findings in a recent publication on RRI in Catalonia, in the context of Spain, (Responsible Research & Innovation in Catalonia. Technical Report)[65], the concept of 'responsible research and innovation' does not appear to play any role in the hands on, daily work of researchers and research groups. This despite the impressive participation of Catalan entities in RRI initiatives funded by the EC, and despite these universities' ascribing to the 'HR Excellence in Research Award' based on the European Charter for Researchers and The Code of Conduct for the Recruitment of Researchers (gender, ethics).

[64] https://www.un.org/sustainabledevelopment/sustainable-development-goals/
[65] (PDF) Responsible Research & Innovation in Catalonia. Technical Report (researchgate.net)

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In universities, steps can be observed made in the dimension of gender equality/ethics/public engagement/open science/science education/citizen science, however not within a guiding, integrative framework of RRI, but rather as principle-specific actions.

Last, the policies and initiatives of higher education, research and innovation from the Generalitat of Catalonia are included in the 2020 National Agreement for the Knowledge Society[66]. It is an agreement approved during the Plenary of the Pact held in May 2020, unanimously supported by the 78 representatives of universities, research centres, students, trade unions, the business world, the territorial sphere and all political groups represented in the Parliament of Catalonia.

The Agreement cites the support for Open Science by way of the Portal de la Recerca de Catalunya[67], which brings together all the information about research carried out in Catalonia, in universities as well as specialised research centres, and its linkages with the European Open Science Cloud. RRI ("recerca i innovació responsable") is specifically mentioned just once in this Agreement, and that is about its contribution to "Revalue scientific culture as an indispensable tool for forming a responsible and critical society and promoting ad hoc training in this regard."

5.3 Report from the Participatory Workshop in Sabadell

The following report presents the results of the workshop organised by the PES-SL in the framework of the RRI-LEADERS project. The workshop was intended to explore **how the territorial stakeholders perceive responsibility (in research and innovation), as well as the RRI keys and AIRR dimensions and their relevance to the overall development policy of the territory in the Catalonia region and the city of Sabadell**. The workshop focussed on reaching a common understanding among the participants on the relevance of RRI-AIRR approach to the territorial policies with a particular focus on the chosen policy area: Smart specialisation in active ageing, circular economy and innovation in design, within the greater Catalonia context.

This report first presents the methodology of the workshop and the overview of participants, and then summarises the issues discussed by the territorial stakeholders in Catalonia / Sabadell.

The workshop's agenda and methodology were designed based on the recommendations given by the Methodological Guidance for the WP 2, Task 2.2 of the RRI-LEADERS project, taking into account the chosen policy area and the type of territorial stakeholders present.

The workshop was held on 15th July 2021 from 9 to 11.30 am in an on-line format, due to the restrictions for face-to-face meetings caused by the COVID-19 pandemic. The platform used was Zoom, provided by the Sabadell partner.

After the welcome and presentation of participants, the methodological partner from Catalonia, the Fundacio Catalana de la Recerca, gave a short introduction to the RRI-LEADERS project, presenting its main goals and focussing on the workshop's objectives. After this, the territorial partner from Sabadell, PES-SL,

[66] Pacte Nacional per a la Societat del Coneixement – PN@SC. Departament d'Empresa i Coneixement (gencat.cat)
[67] Portal de la Recerca de Catalunya: Pàgina d'inici (csuc.cat)

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presented the main results and ideas of the documentary analysis on existing strategies and programmes/plans in Catalonia and in the city of Sabadell, with a special attention on the chosen policy instrument, the Catalan Smart Specialisation Strategy and its realisation in Sabadell.

After this, the methodology of the workshop was presented: participants were divided in two groups in order to discuss in simultaneous sessions the questions posed by the guide but adapted to the Catalan context. They were the following:

- How do you perceive responsibility in research and innovation, as well as RRI keys and AIRR dimensions? Here participants were first asked to prioritise the RRI keys and AIRR dimensions according to the ease of implementation in R & D & I mechanisms, followed by an open discussion.
- Discussion of the opportunities for the embeddedness of RRI-AIRR approach in existing strategies/programmes/plans related to the chosen policy area. Here participants discussed specifically the RIS3CAT and were asked to prioritise a set of existing strategies chosen by them and discuss the implications of the RRI-AIRR approach.
- Identify potential policy areas for future implementation of RRI-AIRR approach.
- Comment on the opportunities to include the RRI-AIRR approach in the policy chosen by Sabadell: the RIS3CAT. They were specifically asked to discuss which of the 5 keys and 4 dimensions of the RRI-AIRR were already included in the RIS3CAT and which were missing.
- Discuss how to include the RRI-AIRR approach to Sabadell's specialisations. Here the stakeholders had to focus specifically in the three specialisation areas: Intelligent design, Active ageing and Boosting the circular economy.
- Identify other relevant areas of public policy where the RRI-AIRR approach can be included. Here participants had to choose and discuss other relevant areas.

After the discussion in the parallel sessions, participants joined the plenary room to present the findings and set the conclusions to the workshop.

To engage participants and to promote the discussion, the online participatory tool MENTI was used, allowing them to prioritise the different keys and dimensions of the RRI in relation to their embeddedness in the existing plans and policy areas. After the prioritisation, participants engaged in an open discussion to delve deeper in their choices.

The workshop was attended by 13 stakeholders, representative of the research, business, and public policy sectors in Catalonia and Sabadell area, some linked to the specialisation areas of Sabadell (design, circular economy, and active ageing), while others were linked to RRI issues or involved in innovation processes in Catalonia and Sabadell. The workshop was organised by representatives of the methodological and territorial partners in Catalonia and Sabadell: the Catalan Foundation for Research and Innovation and the PES SL (Sabadell City Council). It was moderated by two external expert consultants brought by the PES SL.

Perception of RRI, RRI keys and AIRR dimensions

Participants considered that **Science Education** was the easiest RRI key to be incorporated to the research and innovation cycle, followed by public engagement and ethics. The keys that presented more difficulties to be incorporated were open access and gender equality.

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However, this first prioritisation was then further elaborated during the open discussion, stating that the capacity to incorporate these keys to the R&D&I depend on the type of stakeholder: for instance, science education and open access can be easily implemented by research agents through their existing channels, as can be gender equality or ethics. Science education and open access are being increasingly incorporated by the research sector, as they are compulsory elements of research projects, especially those with European funding. Civil society or third sector representatives, on the other hand, found science education a relevant but difficult key to implement, as this is not usually their main goal of action, and they lack the appropriate means to develop activities in this field, while keys as public engagement, ethics or gender equality are more aligned with the goals and missions of their organisations.

Gender equality was considered a transversal key with dependencies with many of the others. For instance, this is a central element to address in science education, as women are underrepresented in scientific and especially in technical careers, making them one of the main beneficiaries of these actions, which requires specific attention when implementing, for instance, public engagement activities. The same is true, according to participants, for young people. ***Public Engagement*** *also presents difficulties mostly related to how to ensure that citizens and users are engaged through all the research and innovation process*, and not only considered in general participatory activities in the initial stages. In this sense, it was mentioned that users should be, for instance, those posing the research questions, not only those who test results, as happens in most of the co-creation processes.

The **Open Access** key also raised discussion regarding its potential conflicts with confidentiality issues, and in the case of public administrations at local level, related to the lack of technical knowledge or capacities to implement it. Moreover, it was noted that open access is not enough if the scientific or R&D content is not made understandable to all, something that is usually not done. In any case, all stakeholders agreed that the public administration is an essential driver in the promotion of the RRI keys, having a "drag along" effect on the rest of stakeholders.

The Science for Change representative said that the third sector entities have responsibility as bridges between society and business sectors and the research sector and other agents that might give answer to their challenges. He also highlighted that *gender issues imply not only gender balance but other issues as family-work balance when doing, for instance, participatory processes (not organising meetings late in the evening for instance)*. It was also claimed that there was a greater need to promote interdisciplinary knowledge to connect research areas more traditionally linked to women (as health) to others such as technology or engineering.

Regarding AIRR dimensions, participants considered **Reflexivity** to be the most easily implemented in the real environment, followed by **Anticipation** and **Inclusion**. In this sense, one of the representatives of the public administration highlighted that *anticipation is becoming more and more incorporated in their way of doing, especially as it is somehow required in the European funded projects in which they participate, for instance through the risk management plan*.

Responsiveness was, according to participants, the one with more difficulties for implementation. It was discussed that the reason might be related to the type of agents that need to be involved to address them: reflexivity and anticipation might be done internally by agents of the same area before engaging in RRI, while inclusion and responsiveness involve external agents and internal changes that might impede its

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management. Regarding this last point, internal resistances to change were found to be a critical barrier to overcome to achieve a real responsiveness in organisations, especially if it implies the undertaking of profound organisational changes.

Discussion of the opportunities for the embeddedness of RRI-AIRR approach in existing strategies/programmes/plans in Catalonia and Sabadell

The participating stakeholders identified several existing strategies and programmes where RRI-AIRR approach could be embedded:

Table 3: Potential strategies and programmes for RRI-AIRR embeddedness

Name of the programme	
Pacte Nacional per a la Societat del Coneixement (Catalan National Pact for the Knowledge Society)	http://empresa.gencat.cat/ca/intern/pnsc
Plataforma Vàlua Sabadell (Third sector platform)	https://www.vaporllonch.cat/economia-social-i-solidaria/plataforma-valua
Xarxa per a la Inclusió Laboral de Barcelona (XIB) (Employment Inclusion Network of the Barcelona City Council)	https://www.bcn.cat/barcelonainclusiva/ca/xarxa13.html
The Barcelona Citizen Science Office	https://www.vaporllonch.cat/economia-social-i-solidaria/plataforma-valua
Participatory Budgets of municipalities	Examples from Barcelona, Sabadell, and other municipalities in Catalonia

From the identified policies, participatory budgets were considered by most participants the type of policy that has most opportunities for the embeddedness of RRI-AIRR approach: they promote accessibility and inclusion, imply public engagement, and can incorporate issues of open access. Moreover, most city councils in Catalonia have such instruments, which would facilitate their use to integrate RRI at territorial level, engaging actors such as citizens. Other existing plans, as the Catalan Pact for the Knowledge Society, were considered a useful tool to promote governance, as they facilitate the creation of consensus about the key elements of RRI.

On the other hand, programmes such as the Vàlua Platform or the Employment Inclusion Network of the Barcelona City Council were deemed relevant as they can be used as platforms to include societal actors in territorial e.g., at local level) initiatives coming from research agents related to RRI. In this sense, the initiative "Barcelona Citizen Science Office" was considered a good practice on how to do so.

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Discussion of the opportunities for the embeddedness of RRI-AIRR approach in the chosen policy area: The RIS3CAT and Sabadell Smart Specialisation project

The presentation done by the Sabadell team about the RIS3CAT and the RRI highlighted (based on the previous analysis) that both policies define priorities aligned with keys as governance, public engagement, science education or open access, which are present in the policy documents and strategies of the RIS3CAT, and even more in the Smart Specialisation Strategy of Sabadell. On the other hand, dimensions such as anticipation, responsiveness or reflexivity are considered in the governance structures of these policies. However, it was stated that it is difficult to embed the RRI in the daily tasks, on one hand as it is conceptually difficult and on the other because some agents, as companies, are not familiar with it even if they might have activities that incorporate this concept. These statements were then discussed by the stakeholders, considering the actual implementation of the RIS3CAT and the Sabadell Smart Specialisation.

Participants noted that **Gender Equality** is present in a formal way in the chose policies, as this is an element recognised by law, and it is a requirement to obtain funding from the RIS3CAT instrument. However, others noted that ensuring gender balance in a research project is not enough, as "*research teams are led in a non-inclusive way*" and the gender perspective in the project implementation must also be considered, which is missing in certain areas of knowledge like engineering.

Regarding **Public Engagement**, it was discussed that there is still a major gap to cover "*from paper to reality, especially regarding social organisations and citizens".* That is, RIS3CAT lacks explicit programmes or activities were these types of actors are included. Last, participants questioned the statement that science education was embedded in the RIS3CAT, with similar reasons as the public engagement – its lack of specific programmes set to promote it. It was noted that scientific research is still widely unfamiliar for groups as youngsters or less educated people, as it seems away from their daily interests. Similar findings were discussed regarding the inclusion dimension: there is a strong focus in the promotion of triple helix collaboration but less so in the case of citizens or the third sector.

Anticipation and **Responsiveness** were other two dimensions in which the discussion was focussed regarding the chosen policy area. Regarding the last one, it was stated that RIS3CAT existing instruments and calls for funding are quite rigid and make difficult to adapt the funded activities to changes; for instance, unexpected delays or change in the budget or personnel are difficult to manage, which detracts from their ability to embed the responsiveness dimension. And while anticipation was considered essential in research because it facilitates the continuous analysis of the social circumstances that are generated around the object of study, it is not clearly embedded in the policy area, as it is left to "*ambiguous and general criteria of the lines of funding*".

After the discussion focussed on the general embeddedness of RRI in the RIS3CAT, stakeholders debated about how to specifically incorporate the RRI keys and dimensions in the smart specialisation areas of the Sabadell strategy: Intelligent design, Active ageing and Boosting the circular economy.

- **Active aging**

Here the stakeholders considered that **Ethics** and **Public Engagement** were the most relevant RRI keys, and science education the least relevant. Regarding the 4 dimensions, they chose **Anticipation** as the most relevant, followed by the **Responsiveness**.

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It was discussed that ethics is a basic principle in any field of research, both in terms of the methodologies used and the management of results, but especially in fields as ageing, were you deal with vulnerable people. The public administration representatives agreed on this point, also stating that in this area the ability to respond to unexpected events is critical, as proven during the COVID pandemics that greatly affected the elderly. Others mentioned that responsiveness and ethics should go hand to hand with transparency and the ability to transmit trust to the citizens.

- **Intelligent design**

Here the stakeholders chose **Ethics** and **Open Access** as the most relevant RRI keys, followed by **Science Education**. Issues of **Public Engagement** were deemed less relevant in this field. Regarding the 4 dimensions, they chose **Responsiveness** and **Anticipation** as the most relevant, followed by inclusion and reflexivity. The ESDI representative stated that for them design implies to analyse, to be able to make the right proposals for products, services and experiences that improve people's lives. Other agents considered that inclusion is also key in this area, to reach the maximum participation in the co-creation processes and include diversity of visions and perspectives.

- **Boosting the circular economy**

Regarding this last specialisation area, participants voted **Public Engagement** as the most critical RRI key, followed by **Ethics** and **Science Education**, while **Gender Equality** was considered the less relevant.

Reflexivity and **Anticipation** were the most relevant AIRR dimensions, while **Anticipation** and inclusion obtained less consensus about their role in this area.

5.4 Summary remarks

After the discussion around the several questions, participants were asked to expose their final conclusions regarding the embeddedness of RRI-AIRR approach in the Research and Innovation and the chosen policy areas. We offer them below:

There are still difficulties in concretising RRI principles in our daily life. There is need for more dissemination of the principles in the practice of public administration, as well as more "transversality" among the different agents involved, which should be encouraged by each organisation internally and through governance mechanisms.

Related to this, it was stated that what is needed is to “land the inputs”, that is the challenge is now how to articulate mechanisms that guarantee the RRI perspective in the different processes and entities.

The consolidation of the RRI requires the commitment of all parties involved, giving special attention to increase the participation of all types of agents and improving the education. In this sense, it is necessary to disseminate and promote the RRI to reach many more stakeholders that will contribute to expand the participation, the reflexivity, and the promotion of this approach.

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At the end, it was considered that Responsible Research and Innovation and its principles can be embedded in all areas of knowledge that are related to social and environmental well-being (politics, economy, sustainability, education ...), but agents need the right tools and resources to do so.

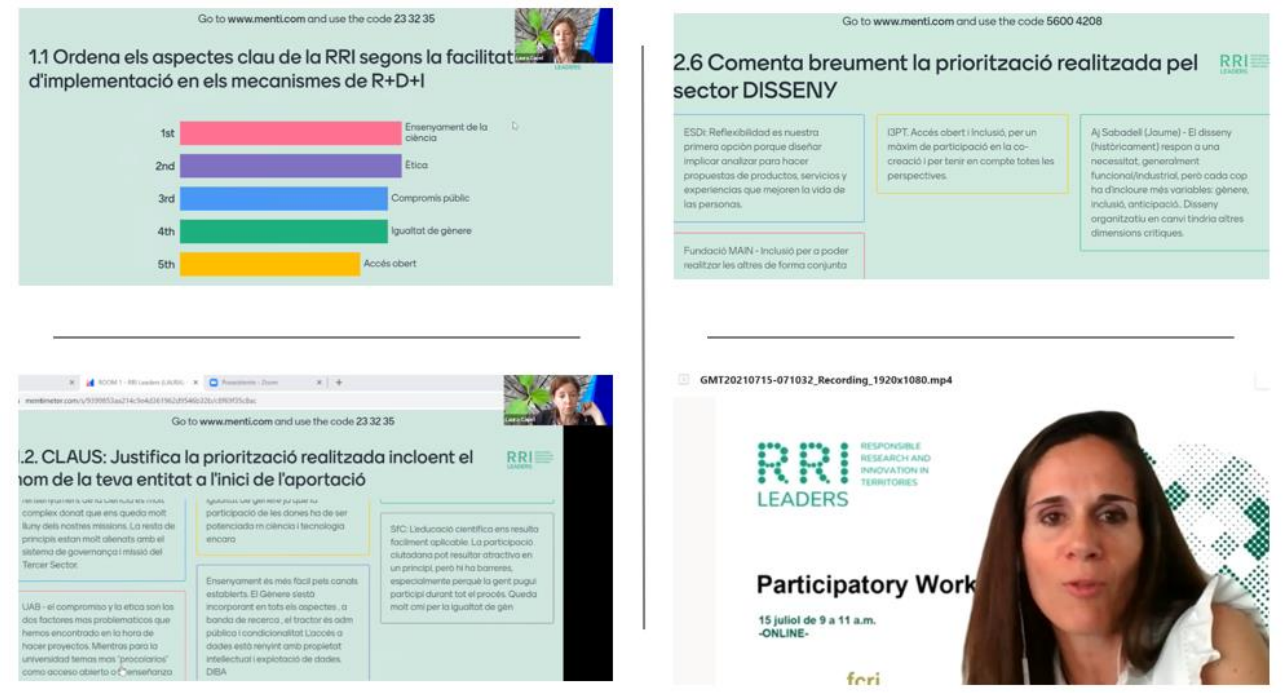

Figure 1: Some images taken during the workshop

5.5 Conclusions

After analysing the documents regarding territorial policies and the participatory workshop's major findings, the RRI keys and AIRR dimensions, though not well concreted in the plans and not even well-known by many of the stakeholders in the territory, are some way de facto addressed and recognised as basic for the success of any endeavour in the implementation of Smart Specialisation Strategies, especially in the themes of circular economy, intelligent design in industries and active ageing which affect important target groups like firms and citizens.

Of particular interest are the keys about open access and public engagement since their application is challenging for technical and/or economical motives as well as for lack of culture and proper official guidelines. In this sense the involvement of public administrations, regional and local ones, is regarded as basic, meaning that for RRI-LEADERS project this aspect should be taken into high consideration.

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As in the case of gender balance, one of the most successfully implemented RRI keys in Catalonia, compulsory by law, only when the administration, regional or local governments promote or enforce the application of measures, do they have a real chance of striving and being replicated.

Likewise, it must be paid attention to the way of communicating the RRI keys and AIRR dimensions and their benefits to all the stakeholders, particularly in the case of private companies, whose survival depends on the economic benefits, to engage them and thus achieve positive results.

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Chapter 6: Conclusions

6.1 Summary of findings from the documentary analyses of the involved territories

The documentary analysis of Sofia Municipality (Bulgaria) focused on ten policy documents at the national level and five at the level of the Municipality of Sofia. All analysed documents are highly relevant to the four policy areas, selected as important for the Sofia municipality and suitable for the application of RRI-AIRR approach. These policy areas are: (a) Digital transition and new skills; (b) Support of innovation; (c) Youth employment and entrepreneurship; (d) Sustainable urban development. The national level documents included four national plans for open science, scientific research, research infrastructure and ICT, one strategy for smart specialisation, and three action plans for the promotion of research, the development of academic personnel and the enhancement of higher education. At the local level, the degree to which four distinct strategies incorporate RRI keys and AIRR dimensions was evaluated. These strategies are: (a) Digital Transformation Strategy for Sofia; (b) Innovation Strategy for Smart Specialisation of Sofia; (c) Sofia Youth Strategy 2017- 2027; and (d) Vision for Sofia 2050. The analysis of these policy documents, both at national and municipal level, shows a significant reflection of the RRI keys and AIRR principles in the planning and decision-making processes. However, it should be noted that in most cases, even though RRI-AIRR elements are evident in the implementation of policies, they are not explicitly mentioned in the individual texts. This, of course, is not the rule in all cases, as some policy documents explicitly mention the principles of public engagement, open access and scientific education.

Regarding the region of Western Macedonia (Greece), documentary analysis refers to two distinct levels, the national and the regional. In a broad sense however, the post-coal transition is directly influenced by broader strategies at European level as well such as the European Green Deal and the establishment the Just Transition Mechanism that followed. At the national level, the National Energy and Climate Plan was evaluated first, as it sets the climate and energy targets by 2030. The focus then turned to the investigation of RRI-AIRR elements in the new Strategic and Business Plan of the Public Power Corporation (PPC), as this plan defines all the individual actions of delignification at the operational level. The National Plan for Just Development Transition was the third policy document evaluated at the regional level. This plan reflects the core of the three policy areas selected for the region of Western Macedonia, which are: (a) Develop a stakeholder engagement strategy within the course of the post-coal transition road map; (b) Strengthen policy-making systems involving different modes of territorial governance of the post-coal transition strategy; (c) Develop a methodology aiming at a smooth and innovative transition from the coal value chain towards an alternative development 'paradigm'. At the regional level, the effort focused on the analysis of five distinct policy documents as well as a series of significant studies that show a strong correlation with the policy focus. The overall evaluation of those documents indicates that the basic principles of RRI-AIRR are identified in most cases and in particular the RRI keys of public engagement and open access. Considering the AIRR dimensions, those that are most often recorded are the principles of anticipatory governance, inclusiveness, and responsiveness. It is interesting, however, that in most texts, these principles are not explicitly mentioned, although they are found in the design and implementation processes of policy making.

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The analysis of policy documents referring to the Municipality of Thalwil (Switzerland) is structured on two spatial levels: at the administrative arrangement of the canton and at the administrative level of the municipality. The strategic document examined in the canton of Zurich (to which the municipality of Thalwil belongs) was the cantonal structure plan of Zurich (2019). This overarching plan defines the basic parameters of spatial development in all municipalities in the canton. This text is considered to meet the basic principles of open access, as citizens have free access to the use of data by applying tools of modern technology. This plan also reflects the principles of anticipatory governance as it incorporates projections and future scenarios of spatial development and spatial risk management. Inclusiveness is also visible as this document includes measures and policies aimed at all societal groups. At the municipal level, three policy texts were analysed: (a) The legislative goals of the municipality in 2018-2022; (b) The municipal structure plan (2015); and (c) the Municipal Energy Plan (2015). It is worth noting that the principles of responsive governance and inclusiveness are found in all three policy texts. This finding shows, on the one hand, the pursuit of policy makers to meet the challenges and needs of the local community, and on the other hand, to involve all its critical local players in social and economic life. The science education approach to documents a) and c), is also identified, as education and training is provided to administrative staff and technicians in the energy construction sector. It is also worth mentioning that in the same documents (a & c) the RRI key open access is detected, in the form of a widespread use of digital technology and targeted information to citizens.

The document analysis of Sabadell City revolves around the policy focus of Smart Specialisation. Within this frame, the analysis refers to the wide Catalonia context as well as the Sabadell city's specific territorial challenges. Regarding the Catalan Smart Specialisation Strategy (RIS3CAT), four strategic objectives are pointed out, focusing on modernisation of the productive base, the promotion of new market niches, the consolidation of creative capacities and the improvement of competitiveness. Along the same vein, seven leading actors are identified, taking into account new economic opportunities in emerging areas, as well as a series of transversal technologies that may transform the productive ecosystem. Based on this broader context, the Sabadell Smart Specialisation focuses upon two relative projects: the PECT Valles Industrial and the RELOS3 project. The first project addressed the themes of intelligent design, active ageing and circular economy. The second project places particular emphasis on the identification of good practices related to implementation of regional Smart Specialisation Strategies in a local context by actively involving local authorities, innovation agents and companies.

6.2 Synthesis of workshop discussions

The aim of the participatory workshops was to explore the perceptions of stakeholders regarding the concept of responsibility and to discuss the degree of integration of the RRI keys and AIRR dimensions in the overall development policy of each territory. Using the findings from the documentary analysis as a starting point, participants commented on the role and place of the RRI-AIRR approach in the chosen policy areas of each territory. All four workshops (one was organised in each territory) produced some very useful conclusions about the RRI-AIRR approach and its relevance to the overall development policy of the territories.

A first conclusion is that RRI-AIRR approach is largely known among all quadruple helix actors, although it has not been formally incorporated into the existing documents and policies. Participants stressed that all RRI

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keys are important, but public engagement was named as the most important one in all four territories. That said, participants from the municipality of Sabadell, the municipality of Sofia and the Region of Western Macedonia stressed that although all quadruple helix actors are involved in public consultations, the voice of civil society needs to be further strengthened. Participants from the municipality of Sofia further noted that public consultations should also involve underrepresented groups, such as citizens with special needs, to ensure (through their participation) that policy priorities meet their needs.

The importance of open access key was also underlined in all four territories. In Sofia, workshop participants named the lack of data evaluation by citizens as a basic obstacle to its further development. In the region of Western Macedonia, it was stated that an online process of evaluation and consultations on all policy-making documents should be developed. Participants in the municipality of Thalwil concluded that although the open data key is applied, there is a problem in the lack of knowledge of the sources available. For this reason, the strengthening of tools and information platforms, as well as an information campaign in the territories are proposed as concrete measures for strengthening open access in the policy discourse.

Both stakeholders in the municipality of Sofia and in the region of Western Macedonia referred to the existing hierarchical model of governance, which is a key obstacle to a more effective communication and management. More specifically, in the municipality of Sofia, the problem is located in intramural communication, proposing a bottom-up governance approach. This can more easily lead to appropriate decisions by the municipal authorities to achieve a transparent, accountable and responsive governance. In Western Macedonia, on the other hand, a bottom-up model of governance is proposed that would combine both national and regional actors in policymaking, to reach a decentralised, transparent and accountable governance.

Scientific education is one of the key issues in the municipalities of Thalwil and Sofia. More specifically, Thalwil workshop participants proposed the inclusion of science education in the elementary education with an emphasis on the territory's policy focus. Although there are many scientific education activities in the territory of Sofia, they are not properly communicated, missing the opportunity for outcomes capitalisation. In the case of both Western Macedonia and Sabadell, stakeholders stressed the role of integrating science education in the policy level, fostering this way research and innovative activities.

The gender balance issue was mostly discussed in the municipality of Sabadell, while at the Thalwil workshop it was stated that gender balance is absent from the policy formulation for the energy transition in the territory. The same is true for the region of Western Macedonia where the participants stressed that both the issue of gender balance as well as ethics have not been formally integrated into the policies of the post-lignite era.

In terms of the AIRR dimensions, participants in all four territories mentioned that all the dimensions are known and have been applied to some extent in the focus policy of each territory. More specifically, anticipatory governance appears in the policies of all four territories, as well as inclusiveness and reflexivity. In the municipality of Sabadell, participants noted that it has been difficult to integrate the responsiveness dimension into the policies and strategies of the territory.

As a general conclusion, it was stated that the RRI-AIRR approach is considered particularly important for the policy discourse in all four territories. For this reason, appropriate concrete measures were proposed, and the necessary tools required to do so were emphasised.

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6.3 Reflection, findings, and conclusions on the embeddedness of RRI-AIRR approach in the territorial policies with a particular focus on the chosen policy areas

As shown in the table 4 below, a total of 30 strategic policy documents were assessed in the four territorial units in Bulgaria, Greece, Switzerland, and Catalonia in Spain. Fifteen (15) refer to the national level, four (4) to the regional level, ten (10) to the level of municipalities, while one (1) strategic document refers to the administrative level of the Swiss canton.

Evaluating the embeddedness of RRI keys in these documents, the dominance of open access, and science education approaches is evident, as they appear nineteen (open access), fifteen (public engagement) and twelve times (science education). It is also interesting that the RRI key of open access appears in a very high frequency in Bulgaria, Switzerland and Greece, while the public engagement appears very often in the strategic documents concerning Greece. These findings show a general compliance of public policy actors with the contemporary needs of citizens' free access to critical information. They also reflect a high degree of public commitment to implementing these policies in accordance with the principles and framework in which they were designed.

It should be noted that RRI keys of ethics and of gender equality appear only in seven (7) and six (6) strategic policy documents respectively. Regarding the ethics, this finding (somewhat less valid for the policy documents in Bulgaria) reveals the need for policies to delve even deeper into the parameters of ethics and science, by opening up knowledge and the scientific approach to larger sections of society. The fact that the gender equality key appears less frequently than any other RRI key shows that there is still a long way to go for planners and public policy implementers to integrate the gender equality approach.

The evaluation of policy documents in relation to the AIRR principles shows that most policy documents have integrated in some way the inclusiveness dimension, as it appears twenty-one (21) times. This finding shows a tendency in all countries and territories to include in the goals and policy measures all the critical players and all the social interest groups. The responsive governance dimension has a significant presence in policies as it occurs twelve times. This testifies about the willingness of policy makers to listen to society and its young people, and to respond to their needs through establishment of appropriate implementation mechanisms and budgets. Another dimension with a significant presence is anticipatory governance as it appears eleven times. The frequent appearance of this principle reflects the willingness of public policy makers to create policies that will meet the requirements of the territories and the society in general.

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Table 4: Total strategic policy documents assessed in the four territories

	RRI policy framework					AIRR Dimensions			
	Public Engagement	Gender Equality	Open Access	Science Education	Ethics	Anticipatory governance	Inclusiveness	Reflexive governance	Responsive governance
Sofia Municipality, Bulgaria									
National Strategic Documents (10)									
National Plan for Developent on the Open Science Initiative in the Republic of Bulgaria			√				√		
National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017-2030		√	√		√		√		
National Roadmap for Research Infrastructure 2017-2023			√				√		
Innovation Strategy for Smart Specialization	√						√	√	√
Strategy for Effective Implementation of ICT in Education and Science in the Rep. of Bulgaria (2014-2020)			√	√					
Act on Development of the Academic Staff in the Rep. of Bulgaria					√				√
Scientific Research Promotion Act			√		√		√		
Higher Education Act					√				
Law on Equal Opportunities for Women and Men		√							
Law for Protection against Discrimination		√							
Municipal Strategic Documents (5)									
Innovation Strategy for Smart Specialisation of Sofia	√		√		√	√			
Digital Transformation Strategy for Sofia	√		√	√			√		√
Sofia Youth Strategy 2017-2027	√	√	√	√			√		√
Vision for Sofia 2050	√		√			√	√		√
Programme for Sofia 2021-2027	√	√	√	√	√	√	√		√
Region of Western Macedonia, Greece									
National Strategic Documents (3)									
National Energy and Climate Plan	√		√			√	√		
Just Transition Development Programme 2021-2027 (SDAM)	√		√	√		√	√		√
PPC Strategic and Business Plan 2018-2022				√		√			
Regional Strategic Documents (4)									
Road Map for a Managed Transition of Coal-Dependent Regions in W. Macedonia		√	√	√		√			
Regional Operational Programme for Western Macedonia			√	√			√		
Stakeholder Engagement Plan (SEP) for Western Macedonia	√		√						√
Territorial Just Transition Development Plan of the Region of Western Macedonia	√					√	√		
City of Sabadell, Catalonia, Spain									
Catalan Strategic Documents (2)									
Strategy for the Smart Specialisation of Catalonia (RIS3CAT)	√	√	√	√		√	√	√	√
FP7 and H2020 Programmes	√			√			√		
Municipal Strategic Documents (2)									
Specialisation and Territorial Competitiveness Project "Vallès Industrial" (PECT Vallès Industrial).	√						√		
Project RELOS3: From Regional to Local: Successful deployment of the Smart Specialisation Strategies.	√						√		
Municipality of Thalwil, Switzerland									
Cantonal Strategic Documents (1)									
Cantonal Structure Plan of Zyrich (2019)			√			√	√		
Municipal Strategic Documents (3)									
Legislative goals of the Municipality of Thalwil (2018-2022)			√	√			√		√
Municipal structure plan (2015)						√	√		√
Municipal energy plan (2015)	√		√	√			√		√
TOTALS	**15**	**7**	**19**	**12**	**6**	**11**	**21**	**2**	**12**

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6.4 Conclusions and recommendations

Deliverable 2.2 is a report on the RRI policy discourse in the four involved territories, focusing on the best possible comprehension of responsibility in research and innovation in the partners' countries. Using the tools of documentary analyses and participatory workshops, the report explores the RRI-AIRR approach embeddedness in the policy discourse, outlining the gaps in the existing policies and the opportunities for its integration.

In total 30 strategic policy documents have been studied. The keys of open access, public engagement, and science education are most often reflected in these documents, while ethics and gender balance are absent in most documents.

Regarding AIRR dimensions, inclusiveness and responsiveness appear in most of the studied documents. The dimension of reflexivity seems to be missing, raising questions regarding reassessment practices and adjustment initiatives in the policy documents of the four territories.

Results of this deliverable in combination with the other two deliverables of WP2 form the basis for the creation of the transformative outlooks (WP4) which will act as action plans for the integration of RRI-AIRR into territorial policymaking. The transformative outlooks will focus on the gaps found in D2.2 and will demonstrate how RRI-AIRR can be taken up as a policy framework in different territorial contexts.

In the aforementioned policy discourses, no formalised pressures to conform to RRI dimensions were identified. This output is aligned with the finding that some were unfamiliar with the concept of RRI. Based in this background, RRI should be more effectively communicated with the key actors which aim at fulfilling the commitment to anchor research and innovation in societal needs. From this perspective, RRI-AIRR approach could be seen as a process supporting social justice and development.

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