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1 Introduction

The main objectives of the ERA-LEARN 2020 Work Package 2 are to provide specific learning and training material and to facilitate knowledge transfer and good practices stemming from Public-Public-Partnership (P2P) community. The specific objectives of Task 2.2 are to survey and analyse activities and progress made among JPIs in relation to the successful implementation of JPIs, which are thought to be essential for an effective development and implementation of Joint Programming Initiatives (JPIs). This is being achieved by elaborating good practice case studies focussing on relevant cross-cutting issues and the provision of one JPI tailored workshop in the course of the annual conference, which informs the community about progress made and options for proceeding in the Joint Programming Process.

1.1 Selection of topics and identification of good practices

For pursuing the objectives of Task 2.2 it was deemed to be necessary to focus on a limited number of topics for which good practice examples should be highlighted in relation to the successful implementation of JPIs. In the first months of the ERA-LEARN 2020 project, relevant topics concerning the implementation of the Joint Programming process, with a distinct relation to the Framework Conditions of Joint programming, emerged from consultation with the members of the GPC. The following topics have been presented in the second ERALEARN 2020 meeting on May 26th 2015 in Brussels:

- Selection and inclusion of stakeholders in Joint Programming Processes
- Open Knowledge, Open Access and IPR policies
- Monitoring and evaluation: Impact of Joint Programming Initiatives
- How to widen participation in Joint Programming Processes and ERA-Nets
- Updating strategic research and innovation agendas
- Increasing interoperability of national funding

Based upon 6 topics/domains that have been deemed of interest for JPIs, the following topics were being further addressed by ERA-LEARN 2020 project in the first year of implementation:

Selection and inclusion of stakeholders in Joint Programming Processes: Various stakeholder groups from academia, policy, intermediary agencies, industry and societal organisations play an important role in the joint programming process. Involvement of stakeholders is of particular importance to help to transfer knowledge and experience, to co-ordinate the use of resources and facilitate the dissemination of research results (OECD 2012). The ERAC-GPC on Joint Programming further identifies four challenges for JPIs (ERAC-GPC 1310/14, p.148):

- Creating a clear concept of stakeholder involvement
- Identifying stakeholders, and determining which organisations and institutions to involve
- Finding out how to address the relevant target groups, and which communication channels to use

- Determining at which stages to involve stakeholders in the whole programming cycle.

The case studies within this topic focus on stages and instruments that are used by JPIs in order to reach out to academic communities, industry and society.

Open Knowledge, Open Access and IPR policies: The implementation of open access and open knowledge policies within JPIs are relevant not only for dissemination of research findings and transfer of research results, but open data and respective databases may also induce new impetus for research and innovation. A key question for JPIs, raised by ERAC-GPC in the working group on Framework Conditions on Joint Programming, has been how to implement open access and open knowledge policies in JPIs. Key issues analysed therefore refer to a presentation of effective activities pursued by JPIs in order to facilitate knowledge circulation, access to open data, etc.

For identifying good practice case studies in the relevant topic areas, the following **propositions** were taken into consideration:

- *Results:* The implementation of the topic within the JPI is not in an initial/starting phase, i.e. more than preparatory steps have been taken to address the topic (at least documented interim results are available).
- *Transferability:* The results have potential to have a high degree of transferability or usefulness for adaption in other settings/JPIs.
- *Approach:* The JPI has made use of novel instruments/approaches, which consulted for instance to a high degree relevant stakeholders at national level.
- *Success:* JPIs are able to demonstrate achievements or to have overcome significant challenges in the course of their operation.

For each topic an additional criteria was to provide a range of cases that are differing in nature in order to provide key insights for different JPIs at all stages of their development.

1.2 Analytical steps for development of case studies

The case study analysis followed the following **steps**, bearing in mind that the overall aim was to highlight good practice cases, for which key principles and had a high degree of transferability or usefulness for adaption in other settings can be assured:

1. *Screening:* A first screening of JPI websites highlighted whether and to which extent the topic to be analysed is present on the JPIs web platform. In particular, a check and documentation of the work-plan of the Coordination and Support Actions of the JPIs and official documents of JPI governing boards were screened.
2. *Selective interview(s)* with JPI representatives clarified whether and to which extent the topic has been covered by the JPI.
3. *Summary:* A short internal bulletin provided information on the status quo of the JPIs' activities in relation to the topic and allowed to select the in-depth case study.
4. *Good practice case study:* In depth analysis of case by means of document analysis and if necessary additional interviews.

5. *Case study report*: Stylised facts on the good practice case.
6. *Discussion and recommendation*: Discussion of key success factors, transferability and suitability.

1.3 The case studies and their targeted audiences

This first annual summary report on good practices in the implementation of JPIs presents four case studies that have been conducted in the course of the ERA-LEARN 2020 project. Three case studies deal with the issue of Stakeholder Involvement at various stages of the Joint Programming cycle and one case study deals with the implementation of Open Knowledge policies within JPIs.

The case study “**JPI Climate Guidelines on Open Knowledge Policies**” provides information on the process of establishing and disseminating open Knowledge Policies within a JPI. JPI Climate is among the first JPIs contributing to the development of Open Knowledge policies in the area of Joint Programming. The JPI Climate Guidelines on Open Knowledge summarize a set of policy recommendations geared at both internal (i.e. JPI Climate governance) and external (i.e. JPI Climate network activities) level. The Guidelines provide a solid basis for kicking-off Open Knowledge guidelines in other JPIs.

The case study “**Co-creation of a Strategic Research and Innovation Agenda in a Joint Programming Initiative - A New Stakeholder Involvement Approach of JPI Urban Europe**” demonstrates how a co-creational process design can be used to integrate the perspectives of heterogeneous stakeholders across different countries when setting up a strategic research and innovation agenda (SRIA). The case study shows that a co-creational process design bears potential to establish sustainable stakeholder commitment and provide a nucleus for (in-)formal stakeholder networks. Co-creation approaches can therefore be regarded as a SHI modality to which other JPIs may refer to in general.

The case study “**JPI Oceans Explores the Potential of Foresight Exercises**” shows how a participatory, stakeholder involving foresight process can serve as a tool to identify future research needs, challenges and solutions. The case study in particular presents the conceptualisation of strategic and thematic foresight plus insights into the implementation of a test run in the field of microplastics.

The case study “**Bridging the gap towards Innovation - The Water JPI Activities on Stakeholder Involvement**” provides information on the Water JPI approach to addresses the complex challenge of stakeholder involvement (SHI) throughout the policy cycle of a JPI with different activities and instruments. Specific attention is given to means to involve innovation-driven end-users (i.e. economic sector respective water suppliers and utilities).

All case studies derive key benefits, success factors, barriers and potentials of implementation for other JPIs. They are geared towards JPI practitioners, dealing with distinct tasks of setting up or advancing open knowledge policies and stakeholder related activities within the governance structures of their JPIs.

2 The JPI Climate Guidelines on Open Knowledge Policies

Access to results and transparency of research and innovation (R&I) activities are key to increase responsibility of R&I, boost innovation and further increase the use of scientific results by all societal actors. Making Open Access reality and progressing towards Open Science, i.e. developing tools for making knowledge creation, transfer and exchange more transparent and interactive for narrowing the gap in diffusion and use of knowledge between research communities and societal actors is a core objective of European Union R&I policies as well as for Joint Programming Initiatives (JPIs).

JPI Climate is among the first JPIs contributing to the development of Open Knowledge policies in the area of Joint Programming. The JPI Climate Guidelines on Open Knowledge summarize a set of policy recommendations geared at both internal (i.e. JPI Climate governance) and external (i.e. JPI Climate network activities) level.

The JPI Climate Open Knowledge Guidelines are mainly focused on accessibility issues (i.e. Open Access to research publications and data), keeping in mind the wider context of the so-called “Open Knowledge” approach, i.e. emphasizing the need to make (climate) knowledge creation, transfer and exchange more transparent and interactive. The Guidelines provide a solid basis for kicking-off Open Knowledge guidelines in other JPIs.

2.1 Background and ambition

The way how research and innovation activities are being performed, knowledge is shared, researchers collaborate and science is organised is subject to constant change. The terms Open Knowledge and Open Science are in line with this on-going transition process, which is driven by a) digital technologies and the enormous growth of data, b) the globalisation and enlargement of the scientific community to new actors (e.g. societal organisations, citizen science), and c) the need to address societal challenges¹. Open Science concerns institutions of the research sphere (research organisations, research councils, funding bodies), as well as the way in which research is assessed, disseminated and used. But Open Science may also concern other stakeholders, especially in the private sector, when it comes to dealing with IPR.

Definitions

Open Knowledge is what open data becomes when it's useful, usable and used. The key features of openness are:

Availability and access: the data must be available as a whole and at no more than a reasonable reproduction cost, preferably by downloading over the internet. The data must also be available in a convenient and modifiable form.

¹ https://ec.europa.eu/research/innovation-union/pdf/expert-groups/rise/study_on_open_science-impact_implications_and_policy_options-salmi_072015.pdf#view=fit&pagemode=none (better to have the proper reference of the document here?)

Reuse and redistribution: the data must be provided under terms that permit reuse and redistribution including the intermixing with other datasets. The data must be machine-readable.

Universal participation: everyone must be able to use, reuse and redistribute — there should be no discrimination against fields of endeavour or against persons or groups. For example, ‘non-commercial’ restrictions that would prevent ‘commercial’ use, or restrictions of use for certain purposes (e.g. only in education), are not allowed.

Source: Open Knowledge International (<https://okfn.org/>)

Open Science is the practice of science in such a way that others can collaborate and contribute, where research data, lab notes and other research processes are freely available, under terms that enable reuse, redistribution and reproduction of the research and its underlying data and methods.

Source: www.fosteropenscience.eu

The OECD identifies the following six rationales for policies on Open Science and Open Data²:

- Improving efficiency in science – Open Science can increase the effectiveness and productivity of the research system, by: reducing duplication and the costs of creating, transferring and re-using data; Enabling more research on the same data; multiplying opportunities for domestic and global participation in the research process.
- Increasing transparency and quality in the research validation process, by allowing greater replication and validation of scientific results.
- Speeding the transfer of knowledge – Open Science can reduce delays in the re-use of the results of scientific research, including articles and data sets, and promote swifter development from research to innovation.
- Increasing knowledge spill-overs to the economy – Increased access to the results of publicly funded research can foster spill-overs and boost innovation across the economy as well as increase awareness and conscious choices among consumers.
- Addressing global challenges more effectively – Global challenges require co-ordinated international actions. Open Science and Open Data can promote collaborative efforts and faster knowledge transfer for a better understanding of challenges such as climate change, and could help identify solutions.
- Promoting citizens’ engagement in science and research – Open Science and Open Data initiatives may promote awareness and trust in science among citizens. In some cases, greater citizen engagement may lead to active participation in scientific experiments and data collection.

² OECD (2015), Making Open Science Reality, Paris.

The JPI Climate Guidelines on Open Knowledge build upon the notions above and provide for JPI Climate set of policy recommendations at both internal (i.e. JPI Climate network governance) and external (i.e. JPI Climate network activities) level. They are mainly focused on accessibility issues (i.e. Open Access to research publications and data), keeping in mind the wider context of the so-called “Open Knowledge” approach, i.e. emphasizing the need to make (climate) knowledge creation, transfer and exchange more transparent and interactive in order to contribute to narrow the gap between climate research communities and societal actors.

As such, they are also in line with the Open Science initiative of the European Commission, which is one of the three key strategic priorities of EU research Commissioner Moedas’ set out in June 2015. In the process of building the European Research Area (ERA), the European Commission also encourages all EU Member States to put public-funded research results in the public sphere in order to ensure wide access and thus strengthen the knowledge-based economy. Public-to-public networks (P2Ps, such as) may have a distinct role concerning the provision of access not only to research results but also research data and research infrastructures, which ultimately can accelerate uptake of new knowledge and foster innovation.

Overall Open Science is expected to lead to more transparency, research integrity, openness, inclusiveness and networked collaboration in the long term. Open Science should increase the impact and quality of science, making science more efficient, reliable and responsive. challenges of our times as well as foster co-creation and Open Innovation. Therefore, the European Commission currently intends to associate the main stakeholders to the development of the European Open Science Agenda and to the take-up of the ensuing policy actions³.

2.1.1 JPI Climate targets

Against this background of a growing policy demand of openness in science and within societies, JPI Climate is seeking to use the opportunity to increase credibility and influence of JPI climate research. The ambition of the Open Knowledge guidelines is to raise awareness and encourage Open Knowledge within the climate-relevant research community (including policy makers, funding agencies, research institutions, practitioners and non-academic stakeholders like NGOs, and industry etc.).

To do so, a comprehensive and ambitious approach was chosen, in which the production of “Guidelines on Open Knowledge” forms a cornerstone for reaching the ambitious objective: “To base the collaborative efforts, encompassed within JPI Climate development and implementation, on the notions of openness, mutual learning, mutual dependency and joint creativity; and to foster the free flow and sharing of information, experiences and opinions” (Manfray 2016). The underlying rationale was that grand and complex societal challenges may only be tackled effectively, if access to knowledge and information and circulation thereof is fostered on a multi-level and multi-institutional level.

³ See: <https://ec.europa.eu/research/openscience/index.cfm?pg=open-science-policy-platform>

2.2 The JPI Climate Approach

This section details the implementation of the Open Knowledge Approach of JPI Climate.

2.2.1 Process responsibilities and concept for operationalisation

The main responsibilities for drafting the Guidelines were defined in the Work Programme of the Co-ordination and Support Action (CSA) of JPI Climate (Task 4.3 “Access to Knowledge and Innovation for Users”). The task was led by the University of Agricultural Sciences in Vienna (BOKU).

The process of drafting the Guidelines was based upon a collective creation process involving multiple actors throughout several stages and lasted for two years, i.e. from March 2014 until November 2015. The preparation of the guidelines can be divided into two main phases: First, a consultation and drafting phase in year 1 (green) and secondly, a testing, adoption and dissemination phase in year 2 (red, see Figure below).

Figure 1: Roadmap to forge guidelines on Open Knowledge



Source: Own compilation based upon Monfray (2016)

2.2.2 Consultation and Drafting

A first draft (V0.1) was elaborated by the Task Leader of the CSA. This document was subject to a considerably long internal discussion process. It was first discussed within a JPI Climate Working Group on Open Knowledge and then three external experts were selected to provide feedback. This first version of the Guidelines was then discussed in bilateral meetings between the Task Leader and the JPI Climate chair at Agence Nationale de la Recherche (ANR).

A first consultation round was then carried out between April 2014 and July 2014. It involved the JPI Climate Management Committee and external experts in matters of Open Access and Open Data management.

A second consultation round addressed members of the JPI Government Board and national experts from research funding and research performing organisations. This allowed in particular to check, whether the JPI guidelines on Open Knowledge were in line with existing national rules and procedures. Because of the comparatively new nature of the topic and a diversity of practices emerging across EU Member States, more than 70 persons have been involved in the production process of the Open Knowledge guidelines of JPI Climate. Hence, in practice the process of creating the Guidelines turned

out to be more complex than expected, in particular because differences in Member States' rules and policies concerning Open Access (Topic 4 of the guidelines) are huge and partially conflicting.

2.2.3 Testing and dissemination

The testing phase then reached out to a wider stakeholder community, including national policy makers, research funding organisations, research performing organisations and representatives from user communities. First, a consolidated draft version of the Open Knowledge Guidelines was discussed at the workshop "Towards Open Climate Knowledge"⁴. The workshop, which lasted one and a half-day was structured in plenary sessions and working group sessions. In the plenary sessions the state-of-the art and needs for open knowledge in climate related research were discussed. The working group sessions discussed three topics related to a) the public and private dimension of climate services, b) data quality standards and c) access to the climate knowledge approach. The results of the working group from day 1 were consolidated in plenary sessions in day 2. Overall, the workshop advised the contributors to:

- focus on the use of existing policies rather than making new regulations
- work more closely with actors like publishers and societies, use collaborations on data, and
- to search for smart collaboration in order to implement existing good practices effectively.

Based upon the results of the workshop, a final draft version of the guidelines was produced and disseminated to the governing board members. The guidelines were then presented at the Governing Board Meeting and accordingly adopted⁵.

In a final Symposium on "Open Climate Knowledge"⁶ climate-related research communities, research funding organisations, policy makers and practitioners were invited to discuss together on how societies can manage data and information to create knowledge (and ultimately wisdom) with problem-solving character. Main objectives of the symposium were:

- to foster the discussion on how to promote, design and implement effective and comprehensive policies towards open access and open knowledge,
- to build knowledge capacity through the presentation and discussion of practice examples including funding organisations and other fields of knowledge.
- to reinforce and legitimise the JPI Climate Guidelines on Open Knowledge as a toolbox for policy makers and research funding organisation when designing and executing climate research policies.

⁴ <http://www.jpi-climate.eu/news-events/archivenews/workshoptowardsopenclimateknowledgejanuary2015>

⁵ The guidelines relate to the dimensions: 1) Internal accessibility, 2) Open licensing, 3) Open formats, 4) Open Access publishing, 5) Open Data, 6) Publishing costs, 7) Open Access publishing compliance, and 8) National rules.

⁶ <http://www.jpi-climate.eu/news-events/events/10862495/Symposium-Designing-Comprehensive-Open-Knowledge-Policies-to-Face-Climate-Change>

More than 60 participants from 40 different organisations in 15 different countries all around the world registered to the symposium, for which a comprehensive results report was published⁷. The symposium identified room for improvement on the guidelines, which were expressed by putting forward seven distinct recommendations for JPI Climate, including research funding organisations to establish mandates for Open Access to Publications, ensurance of funding for article processing charges beyond a project lifetime, openness of research data, metadata, software, methods etc. funded by public bodies, and the promotion of use of free standards. It was also recommended to encourage discussion on ways to foster research “co-design” and “co-production” in scientific fields where transdisciplinary approaches are needed. The recommendations of the final symposium were included in the final Guidelines. Hence, despite of a given room for improvement (see p. 5 of the final Guidelines), it can be stated that the Guidelines’ contents are on the right track.

2.3 Key results and achievements

2.3.1 Transferable guidelines on Open Knowledge

The process resulted in a final set of Guidelines on Open Knowledge, which exist in a short and an extended version⁸. They are part of an ambitious approach set by the JPI Climate Strategic Research and Innovation Agenda (SRIA) to improve the societal benefits of climate research. activities. The Guidelines provide clear indications on how to define JPI Climate Open Knowledge policies both at internal level of the JPI governance structures and the external level (i.e the R&I actions performed by JPI Climate community. For each dimension of the guidelines (see box below), definitions, clarifications and specific suggestions and examples are provided.

Box 1: JPI Climate policy guidelines on Open Knowledge

1. **Internal accessibility.** Working documents of general concern should be accessible for all JPI Climate members and partners.
2. **Open licensing.** The use of the Creative Commons (CC) “public domain” license (CC0) is encouraged/obligatory/suggested when publishing any kind of internal document foster the proper management of intellectual property and the broad distribution and use of information.
3. **Open formats.** The use of open formats, i.e. ODF (e.g. *.odt, *.ods, *.odp) for working documents is encouraged to allow for broad compatibility.
4. **Open Access publishing.** Research results being funded in the context of JPI Climate will be published either through (i) Open Access journals, books or proceedings (i.e. “gold” Open Access) or (ii) self-archiving of subscription-based formats incl. embargos (i.e. “green” Open Access). Other possibilities offering restrictive Open Access rights through e.g. national contracts with given publishers are explicitly discouraged.

7 See: http://www.jpi-climate.eu/media/default.aspx/emma/org/10868118/JPI+Climate+symposium+on+Open+Knowledge_Final+Report.pdf

8 http://www.jpi-climate.eu/media/default.aspx/emma/org/10862501/JPI+Climate+Guidelines+on+Open++Knowledge_extended+version.pdf

5. **Open Data.** Research data and meta-data derived from any funded activity in the context of JPI Climate will be freely available in an existing certified repository under the CC0 license (see point 2). The publication, storage and preservation strategy should be detailed in a Data Management Plan (DMP) to be submitted in the proposal and to be evaluated as a part of it.
6. **Publishing costs.** Costs related to Open Access and Open Data will be foreseen in the budgets of activities launched in the context of JPI Climate, such as joint calls. Fostering “gold” Open Access will mean financially covering the so-called “Author Processing Charges” (APCs).
7. **Open Access publishing compliance.** JPI Climate will establish incentives and control mechanisms that are required to assure a successful implementation of these recommendations.
8. **National rules.** These recommendations (1 to 7) will be actively used and disseminated when coordinating research activities in the context of JPI Climate, including workshops, summer schools, symposia and so forth. When funding transnational calls, each funder is explicitly called upon to include these recommendations into their national annex.

Source: JPI Climate Guidelines on Open Knowledge (2015).

Although the creation process of the Guidelines originated from the JPI Climate community, the final set of recommendations and guidelines (see box above) are not only relevant for JPI Climate, but instead address in a specific manner principles on Open Knowledge, which could serve as a common basis for adoption of Open Knowledge principles by other JPIs. This seems to be particular the case, because JPI Climate has consulted with a large number of stakeholders from research funding organisations at EU Member State level, going beyond the JPI Climate Community.

2.3.2 Increased credibility of Open Knowledge Policy

For the JPI itself, the adoption of the Guidelines by the governing board can be considered a major step forward in the implementation of Open Knowledge Policies. The decision of the Governing Board concerned three levels⁹:

- Level 1: to adopt the Guidelines on Open Knowledge in both a short version and a standard version;
- Level 2: to actively promote the Guidelines at an “internal level” when conceiving and executing strategic and operational actions within JPI Climate;
- Level 3: to actively promote the guidelines at “national level”, to encourage members and associated partners to embed the guidelines in their own research coordination activities.

Hence, the official adoption of these guidelines implies a high degree of relevance and accountability, including the organisation of a call for future actions.

⁹ https://www.era-learn.eu/events/annual-joint-programming-2015-new-date-2016/topic-3-strategies-for-fostering-open-knowledge-and-open-access-in-research/03_Openaccessandopenknowledge_JPIClimate_P.Monfray_15jan16.pdf

This achievement can also be attributed to the long-lasting and time intensive production process, which involved not only the governing structures of JPI Climate, but reached out to the relevant stakeholder communities in iterative steps.

2.3.3 Mobilisation of stakeholder communities and awareness

The Open Knowledge initiative from JPI Climate, which lasted for 21 months, managed to mobilise and actively engage a large number of potential JPI Climate stakeholders not only from the European climate research community but also communities in other related research areas, national funding agencies and practitioners. It thereby significantly contributed to raise awareness for this topic, which has so far not been in the core agenda of the JPI and still is, too often associated only with Open Access to publications.

The final symposium on Open Knowledge pointed out¹⁰, “access and availability issues are just one issue within the “openness” approach of “Open Knowledge”/“Open Science”. Therefore, comprehensive policies (i.e. tackling the whole research cycle) should encompass measures related to “reuse and redistribution” of data, information and knowledge in order to better identify pathways that facilitate impact.

The concrete ways to make steps towards more progressive “open knowledge” policies are diverse and are not necessarily incompatible, as the example of the “green” (i.e. repository-driven) and “gold” (i.e. Open-Access journal-driven) way shows when fostering Open Access to research publications.”

2.4 Challenges relating to the implementation of Open Knowledge Guidelines

Challenges relate both to the definition of the appropriate content of the Open Knowledge Guidelines and to the process of further implementing the Guidelines.

2.4.1 Green vs. Gold Open Access

Content related challenges relate in particular to the use of Green Open Access vs. Gold Open Access (see Box 1). Funding agencies dealing with funding of basic research pointed to the fact that the number of Open Access Journals is booming but it is not yet clear to which extent they can be acknowledged in terms of meeting high scientific standards. A quality measure to consider in this case is the widely acknowledged repositories such as Web of Science or Scopus, on the basis of which the majority of scientific impact indicators are calculated today.

2.4.2 Institutional frameworks and initiatives providing free and open access to scientific knowledge

The Open Knowledge Guidelines show:

¹⁰ : http://www.jpi-climate.eu/media/default.aspx/emma/org/10868118/JPI+Climate+symposium+on+Open+Knowledge_Final+Report.pdf

- a number of relevant international institutions, including the European Commission have already incorporated guidelines and rules concerning Open Access in research programmes,
- at a national level the number of initiatives related to Open Access including policy guidelines, databases etc. has increased exponentially.

Against this background, it is a clear challenge to identify the most useful approaches and databases etc. for the purpose of a JPI and streamline existing procedures on the one hand, while taking into account that Open Science Initiatives have been mostly driven bottom-up by research communities. As also the discussion of the ERA-LEARN conference has pointed out in this regard, policy should act as a facilitator and not as an imposer of services or criteria. At the same time, measures are needed to harmonise interoperability and services for utilization of open research data¹¹.

2.4.3 Use of Open Formats

Going beyond open access, the use of open formats for publishing results of working documents was also heavily debated and considered to be difficult by some during the creation process of the guidelines. Arguments were that some operating systems still face technological challenges in using open formats and some organisations have binding rules on using certain programmes. However, throughout the consultation process, others considered the ambition to use open data formats as non problematic at all. It is also expected that an increasing use of interoperable cloud services would further diminish the relevance of open data formats.

2.4.4 Progressing the implementation road

The JPI Climate symposium on Open Knowledge pointed out that a key challenge ahead is to proceed in the implementation road and to actively adopt the “policy guidelines” in the course of the forthcoming funding activities of the JPIs. It was recommended that:

- in the course of the upcoming joint calls of JPI Climate, applicants and evaluators should take them into consideration
- the guidelines should be included in the proposal eligibility and evaluation criteria.
- the call organisation committee should encourage each funder to include them in their national annexes.

Securing high compliance concerning Open Access publishing is considered to be of crucial importance. This may only be achieved if incentives such as coverage of publication costs are provided in the course of funding of research activities.

¹¹ https://www.era-learn.eu/events/annual-joint-programming-2015-new-date-2016/ERALEARN_2020_D5.22015_FINAL.pdf

2.5 Conclusions

The JPI Climate Guidelines on Open Knowledge can be seen as a solid basis for advancing Open Knowledge practices in Joint Programming Initiatives. It thereby responds to the increasing relevance of Open Knowledge in the international science policy context and the fast moving data market, which enables new options for sharing and using different sources of data.

The Guidelines promote the practical implementation of Open Knowledge policies at governance and network level for JPI Climate.

The resulting guidelines are relevant for other JPIs as they provide information on content and implementation for Open Knowledge guidelines. Summarizing, the following key factors of success for implementation of the Open Knowledge guidelines can be identified:

- Building trust and common understanding: intensive discussions within the JPI governance structures and stakeholder communities are necessary to raise awareness concerning relevance and means for operationalization of Open Knowledge practices. Therefore, a process oriented design with multiple feedback loops is necessary to jointly agree upon Open Knowledge policies.
- Clear responsibilities at operational level: A core team with clear objectives needs to be built. This core team needs to have a clear mandate from the governing bodies of a JPI and resources for developing the process.
- Approval at governing level may only be achieved if communication between the operational team producing the guidelines, and the governing boards approving the guidelines is well articulated.
- Adoption at operational level: The adoption of the guidelines at an operational level requires not only dissemination activities but further actions at the level of JPI governing structures and funding agencies. These need to comprise among others incentive mechanisms for researchers, guidelines for evaluation of research proposals, and recommendations for use of joint repositories.

3 The Co-creation of a Strategic Research and Innovation Agenda in a Joint Programming Initiative - A New Stakeholder Involvement Approach of JPI Urban Europe

The Joint Programming Initiative Urban Europe (JPI UE) has entered new ground in terms of stakeholder involvement (SHI): a co-creational process design was established to draft the strategic research and innovation agenda (SRIA).

This innovative and explorative approach demonstrates a promising way to integrate the perspectives of heterogeneous stakeholders across different countries. It also bears potential to establish sustainable stakeholder commitment and provide a nucleus for (in-)formal stakeholder networks. Co-creation approaches can therefore be regarded as a SHI modality to which other JPIs may refer to in general.

This case study is particularly interesting for practitioners of JPIs who are interested in upgrading the quality of stakeholder engagement and want to learn more about Co-creation processes, its methods, applications, and good practice. In addition, JPIs' staff who plans to revise their SRIA can extract inspiration and concrete suggestions for its process.

In order to grasp the backdrop of the Co-creation approach, we firstly introduce the JPI's aims, the role of its stakeholders, its general stakeholder involvement strategy, and its organisational structure. We then provide insight into the co-creation design of the SRIA development and describe its implementation. The last two chapters present key benefits and key factors of success as well as its potential for replicability.

3.1 Background and Ambition

3.1.1 The aims of JPI Urban Europe

The overarching aim of JPI UE is to create attractive and sustainable urban areas in which European citizens, communities and their surroundings can flourish. It is a mission- and demand-oriented, long-term programme that takes up city and societal needs. It applies a transdisciplinary perspective in order to raise the level of understanding of urban complexity and generate new concepts to tackle emerging challenges. JPI UE offers its 13 member countries¹² (and observers¹³) the opportunity to generate European solutions for urban challenges by means of coordinated research.¹⁴

The JPI's vision and mission statement emphasizes that urban development affects life of nearly everybody and the "focus on social participation is key, when facing urban challenges". The stakeholders are consequently the JPI's "backbone" and the SHI occupies center stage.

The approach of Urban Europe is thus "integrative, interdisciplinary and horizontal [...] across all related disciplines and sectors, serving society by raising public awareness and acceptance, and consequently

¹² i.e. Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Slovenia, Sweden, and the United Kingdom

¹³ Portugal, Poland, Latvia, Spain, Romania

¹⁴ cf. <http://jpi-urbaneurope.eu/about/what/>

putting expertise into practice”¹⁵. The SHI requires local modification, translation, and redesign by (and for) various stakeholders – the high ambition of the management board (MB) was thus to draft an adequate SRIA in order to live up to the heterogeneous stakeholder environment.

3.1.2 The general stakeholder involvement strategy

The internal (represented in formal bodies) and external stakeholders involved shall reflect the general stakeholder environment of JPI Urban Europe’s thematic focus. This implies the integration of the four stakeholder groups: civil society, academia, private sector and policy makers. These stakeholders furthermore represent the local, regional, national, and European level.

Due to JPI UE’s focus on stakeholder contribution at local level, the assigned role of stakeholders goes beyond one-directional dissemination of information and consultation, aiming at a high level of stakeholder involvement (see figure 6 in annex). Special emphasis is therefore given to their active involvement, collaboration and empowerment.

The following principles of the SHI strategy are derived from interviews and SHI activities:



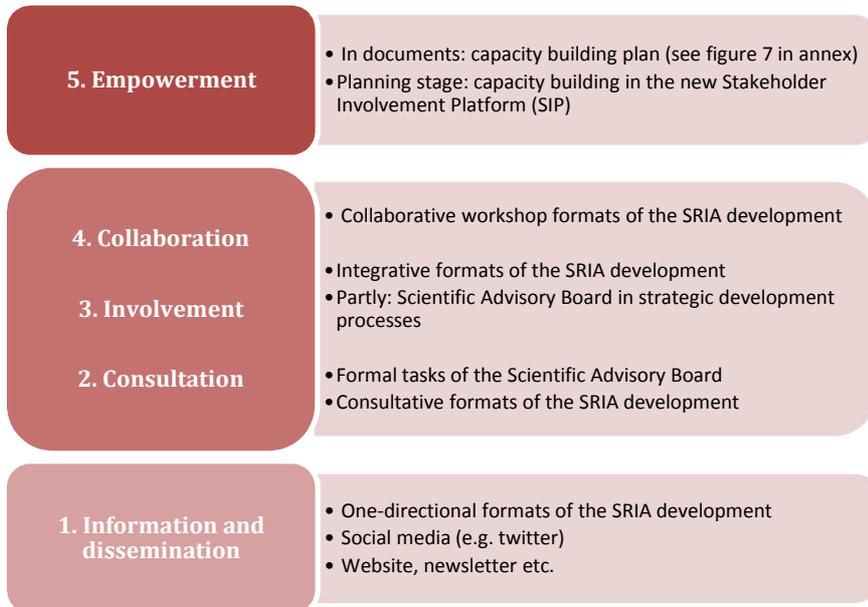
- SHI is rather understood as a *process* (Co-creation of the SRIA) than a formal body or a compilation of activities.
- SHI is based on Co-creation principles, i.e. the *balanced top-down* (ensuring that objectives and the overarching aim is met) and *bottom-up* processes (providing the openness for new ideas, partnership at eye level, and a source of motivation for stakeholders).
- SHI covers all levels of *stakeholder involvement* (see figure 1)¹⁶.
- SHI activities cover *all phases of the policy cycle* to differing degrees: all levels of involvement took place in agenda setting (i.e. the Co-creation of the SRIA), stakeholders take up a advisory role in policy formulation, decision-making as well as policy implementation (although to a lesser extent), and they will provide feedback for the evaluation.

¹⁵ The JPI Urban Europe - Vision and Mission <http://jpi-urbaneurope.eu/publications-2/>

¹⁶ Exemplary activities by level of stakeholder involvement (JPI governance) are:

1. Information and dissemination: website, twitter, newsletter
2. Consultation: formal tasks of the SAB, consultative formats of the SRIA development
3. Involvement: integrative formats of the SRIA development facilitating dialogue at eye-level
4. Collaboration: c.f. Co-creation processes of the SRIA development
5. Empowerment; cf. capacity building plan (see figure 8 in annex)

Figure 1: Exemplary SHI activities by levels of involvement



Source: Own compilation

The organisational structure of SHI (see figure 2) features several *formal bodies* of stakeholder groups. In addition, temporary stakeholder groups got together in various types of meetings in the course of the SRIA development and the SEiSMiC project¹⁷. These boards, platforms, and networks mirror the multi-level and cross-system stakeholder environment. These formal bodies represent the research (Scientific Advisory Board and Urban Europe Research Alliance) and the political perspective (Governing Board and Funding Agency Working Group):¹⁸

- Scientific Advisory Board (SAB): The advisory body is responsible for offering strategic advice affecting the strategic orientation and outline of JPI Urban Europe. Members are internationally distinguished academics representing the major urban research areas.
- Urban Europe Research Alliance (UERA): The platform of research organizations represents the supply-side of research.
- Governing Board (GB): It is the ultimate decision-making authority of JPI Urban Europe and all JPI Urban Europe members have a seat on the GB and are required to bring decision-making authority

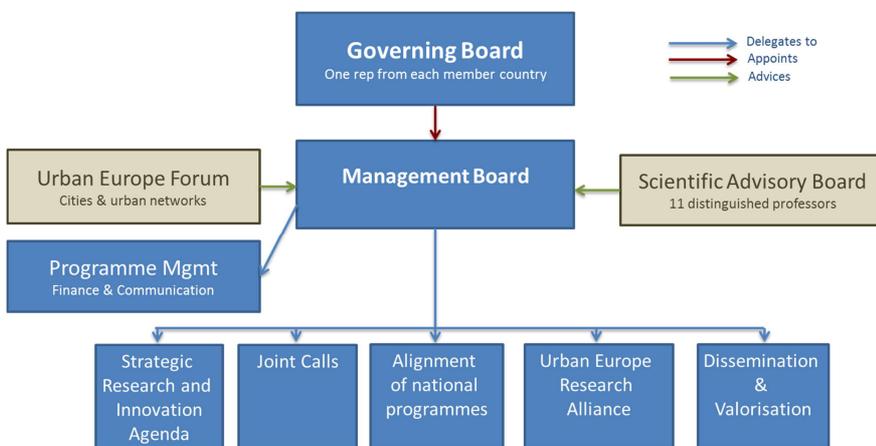
¹⁷ Societal Engagement in Science, Mutual Learning in Cities (SEiSMiC); the project is funded by the 7th Framework Programme and sets up national networks (NaNets) in 10 European countries focussing on engaging society in urban research. These networks include civil society organizations, research performing/funding organizations, industry/business, and policy makers.

¹⁸ <http://jpi-urbaneurope.eu/about/governance/>

for their country. The GB acts in the interests of the JPI Urban Europe, safeguarding its goals and mission, identity and coherence. The GB is an internal key stakeholder of JPI UE and represents its internal political interests.

- Funding Agency Working Group (FAWG): The FAWG consists of 19 national funding agencies supporting JPI Urban Europe with the execution of the Joint Calls and is responsible for contributing to the achievement of a streamlined process during the evaluation and selection of proposals.

Figure 2: JPI UE Governance structure



Source: <http://jpi-urbaneurope.eu/about/governance/>

3.2 The Approach

3.2.1 The Co-creation of the Strategic Research and Innovation Agenda

The Coordination and Support Action (CSA BOOST) offered the possibility to meet the JPI UE's high ambition to draft an aspiring SRIA that integrates the stakeholders' viewpoints and needs in an adequate way and to set a legitimate course for the next five years. The design of the SRIA development process considered the major challenges of the JPI's SHI: the *heterogeneity of stakeholders* and issues as well as to keep the *balance of political* (of the MB and GB) and *stakeholder interests*.

In order to realize the stakeholders' full potential during the process, the approach shall *allow time to build up trust* among these transdisciplinary and international stakeholders. In addition, the long-lasting SRIA development implies the necessity of methods assuring the motivation and *engagement* of the

participants during the whole process and, at best, also after its finalization. For these reasons, the application of a *Co-creation process design*¹⁹ was applied (see info box).

Definition of Co-creation

Co-creation is the “active involvement of stakeholders, in particular end-users, in the design of new goods and services”. Co-creation was originally developed in the private sector as an approach to foster value-creation and innovative product-development by integrating both the company and their customers.

In the public sector, Co-creation refers to the “active involvement of citizens in public service delivery by creating sustainable partnership”. Main characteristics of Co-creation are a) collaborative, participative, and reciprocal elements that facilitate dialogue as equals, b) balanced top-down and bottom-up communication streams, c) and the creation of common values at first and build up commitment in the long run.

3.2.2 Principles and conceptualisation of Co-creation

The aim of the SRIA development was to understand the research area’s heterogeneous stakeholders and integrate them collaboratively in the SRIA. Therefore, the design of the process combines methods that address the stakeholder involvement levels “collaboration” and “involvement” (cf. figure 6 in annex).

When designing the process, the project team pays special attention to balanced top-down and bottom-up communication streams:

- Top-down communication
The MB plans and implements adequate formats, structures, and methods that shall ensure the steering of the highly complex process. The management holds the reins when bundling and streamlining the outputs of single events and ensures their smooth processing.
- Bottom-up communication
Main actors are the stakeholders (operational as formal bodies or as temporary entities, networks or platforms) that are the source of information and innovative ideas. According to the purpose of an event, they meet in different formats such as workshops, consultations, and working groups. The applied participative approach fosters motivation and engagement among stakeholders and, in addition, bears symbolic value and can potentially be the starting point for a stakeholder network.

¹⁹ Zwass, V. (2010). "Co-Creation: Toward a Taxonomy and an Integrated Research Perspective." International Journal of Electronic Commerce 15(1): 11-48.

Voorberg, W. H., V. J. J. M. Bekkers, et al. (2015). "A Systematic Review of Co-Creation and Co-Production: Embarking on the social innovation journey." Public Management Review 17(9): 1333-1357.

Von Hippel, E. (2007). Horizontal innovation networks - by and for users. Industrial and Corporate Change, 2(1), 1-23.

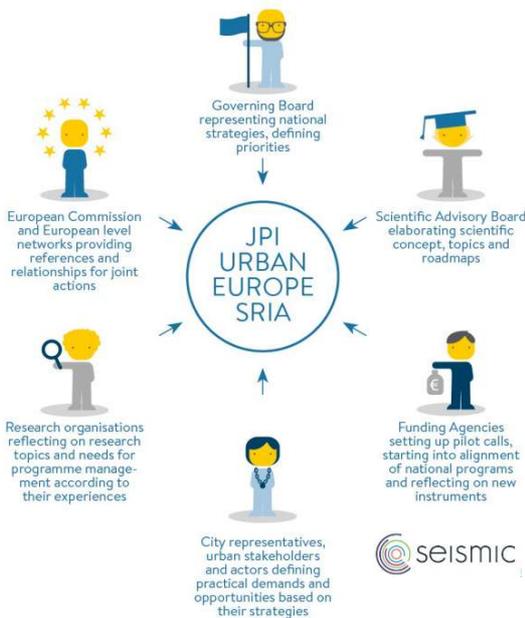
An example for a balanced bottom-up and top-down management during the SRIA development:

The MB offered both *latitude* and *guidelines* to a certain extent. As an ideal-typical example, the MB enables a consistent workshop output for further processing. Therefore, the MB provides means to ‘streamline’ the results, e.g. templates for the agenda. At the same time, the management leaves room for country/stakeholder specific needs and ideas. In the next step, the SAB includes the coherent results of the work-

Since the SRIA shall foster cooperation among a wide range of stakeholders, the *identification of stakeholders* was a decisive and challenging task carried out carefully in advance. Relevant stakeholders are assigned to the following external groups (see figure 2), i.e., funding agencies, city representatives, the European Commission (including European level networks) and internal stakeholder bodies, i.e. SAB, GB, UERA as well as various actors engaged in the SEiSMiC project.

The Co-creation approach helped the MB to identify new stakeholders: the process initiated a self-selection of stakeholders in the course of the SRIA development and the MB identified further stakeholders answering the *dynamics of the stakeholder environment*.

Figure 2: Identification of stakeholder groups relevant for the SRIA development



Source: <https://www.era-learn.eu/events/annual-joint-programming-2015-new-date-2016/topic-2-engaging-stakeholders-in-public-public-partnerships>

3.2.3 Basic elements of the process design and its implementation

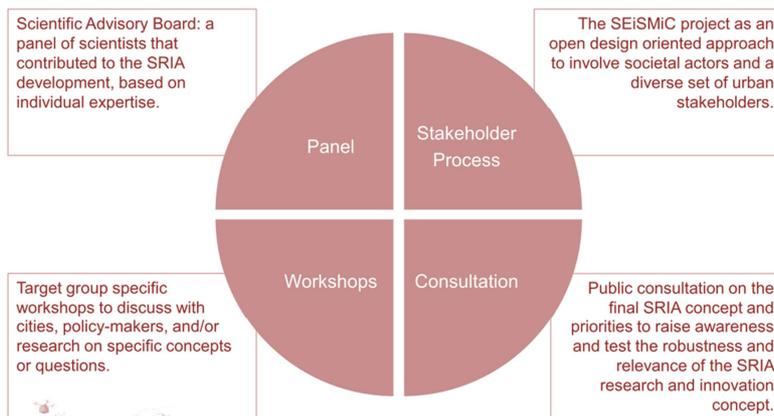
According to the presented principles and conceptualisation of Co-creation, the process design's main characteristics are a *balanced bottom-up and top-down communication streams* as well as *iterative and multi-level patterns*²⁰ that are supposed to guarantee the inclusion of relevant internal and external stakeholders' inputs, its adequate processing, and a cross-system review.

As the overall design of the SRIA development is of high complexity, we firstly provide a simplified overview of the *main contributors* to the SRIA, the *ideal-typical iterative procedure* of the SRIA revision as well as the process design's *basic and specific formats*. Secondly, we present the actual process sequence (that differs from the original design) and present some distinctive points of implementation.

Main contributors

According to figure 3, the four main contributors and their function are 1) the SAB panel that backed to the SRIA by bringing in interdisciplinary scientific expertise and helped drafting a Megatrend report²¹ beforehand as a starting point for the SRIA, 2) the stakeholders participating in the SEiSMiC project that provided input by local stakeholders at the beginning of the process, in particular in regards to stakeholders' vision and concrete end user needs, and 3) targeted stakeholder groups bringing in the local, national, and European level. In the end of the process, 4) public national consultations tested the SRIA concept.

Figure 3: Main contributors and their function



20 Bylund, J. (2015). Co-creating a Strategic Research and Innovation Agenda (SRIA) for sustainable and liveable urban futures. Dialogues of Sustainable Urbanisation: Social Science Research and Transitions to Urban Contexts J. M. Condie. Penrith, N.S.W., University of Western Sydney.

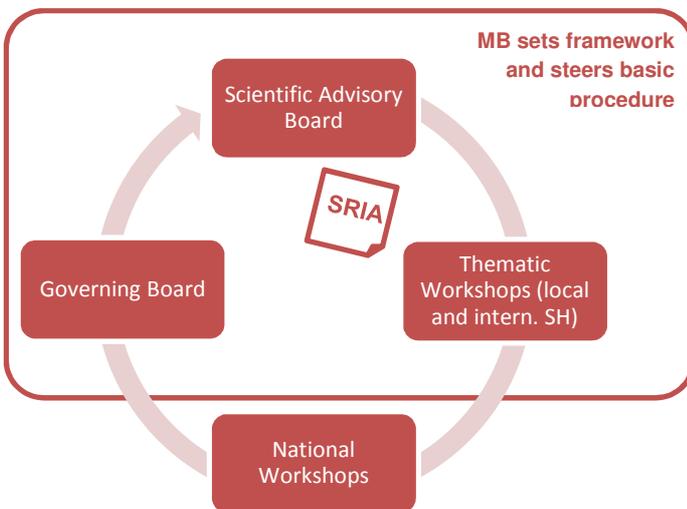
21 JPI Urban Europe, Scientific Advisory Board. Urban Megatrends: Towards A European Research Agenda. <http://jpi-urbaneurope.eu/downloads/jpi-urban-europe-megatrends-report/>

Source: <https://www.era-learn.eu/events/annual-joint-programming-2015-new-date-2016/topic-2-engaging-stakeholders-in-public-public-partnerships>

Basic procedure

Figure 4 shows the *basic procedure* of the iterative process design. This ‘baseline’ recurred five times in different variants (cf. figure 5).

Figure 4: Basic procedure of SRIA Co-creation



Source: own compilation

The MB sets the framework and is in charge of steering the process in a top-down manner while providing latitude and allowing room for emerging dynamics at the same time. The iterative process starts with headlines of an initial SRIA document and, in the course of the process, more and more flesh is put on the bones resulting in the final version of the SRIA after the last iteration.

The fundamental idea of the basic procedure is to implement a feedback loop that is supposed to keep the balance between internal political (GB) and stakeholder interests (SAB, stakeholders in national and thematic workshops). The feedback aims at identifying priorities, gaps, and particular aspects that were important for the stakeholders. The next level of details is developed and added to the SRIA document and the next feedback loop will work with this elaborated document.

Basic and specific formats

Basic formats range from small-group events to large forums. Small-group events are usually workshops in which the main work of the SRIA’s input generation is done (see basic procedure). In these workshops, collaborative methods are applied, such as world cafés in various styles and round table discussions with stakeholders.

In addition, several specific formats work as interventions: they are introduced with a particular aim depending on the needs of a project phase. For example, a positive vision had to be set at project start in order to establish ‘common ground’ and provide a motivational source for the stakeholders, therefore, a

workshop on needs and visions took place during the first iteration. Another example is a high-profile event at project launch that aimed at involving key stakeholders and ‘hard-to-reach’ actors. In the end of the process, national consultations took place to test SRIA outline and raise awareness of a broader audience.

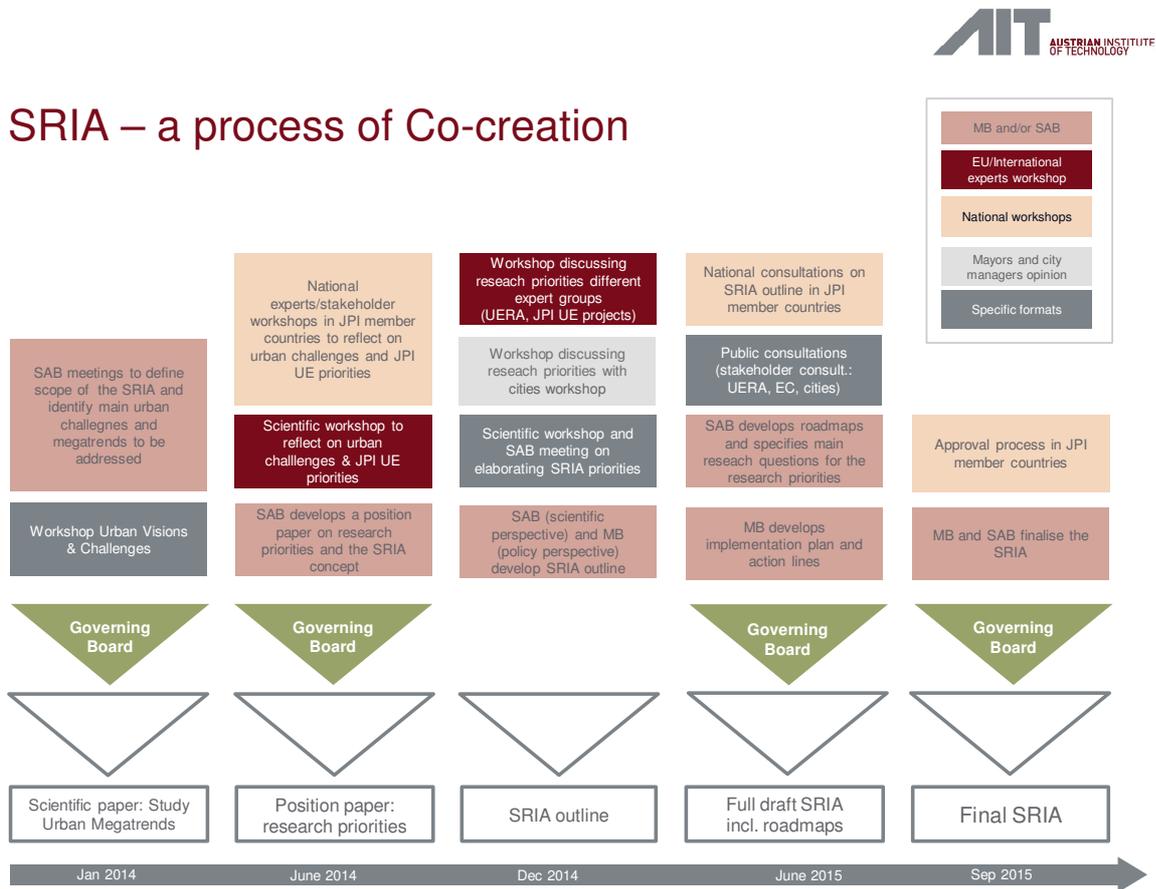
Actual process design and implementation

Figure 5 shows the realized process that differs from the original design. We depict the implemented version in order to indicate the necessity of adjusting to process dynamics. The interviewees described this process adaption as a flexible step-by step approach that was essential to account for the stakeholders’ needs and to keep the balance between political and stakeholder interests.

The figure shows five iterations of the (adapted) basic procedure. A ‘pillar’ of events demonstrates one iteration. The output of each iteration, i.e. the SRIA document and its predecessors, is displayed at the bottom of each column.

Please note that, beforehand, the “Megatrend Study” was conducted and presented at the “JPI UE Conference” (Mar 2014) communicating the need for this action. Another important event that rounded off the process in the end is a conference presenting the SRIA and raising commitment for its joint implementation (Oct 2015).

Figure 5: Actual process design of the SRIA development



Source: own presentation

3.3 Key results and achievements

As an overall assessment and according to the interviewees, the SRIA document, the main output of the Co-creation process, was appraised positively by the JPI members and partners, the stakeholders involved, and the wider public. In particular, the interviewees assessed very positively the process management by the MB and the support provided by JPI bodies (especially GB and SAB). The following key benefits, key factors of success, and notes to replicability are derived from interviews.

3.3.1 Key benefits

Several key benefits of the Co-creation approach contributed to this positive assessment of the SRIA: The process-inherent ‘dynamic’ selection of stakeholders resulted in a satisfactory selection of relevant stakeholders²². A continuous reflection adaption by the MB guaranteed an organic and appropriate development of the stakeholder environment.

- Several bottom-up formats are supposed to leave room for creative and innovative ideas that a) improved the quality of results, b) enabled social innovation, and c) fostered stakeholder awareness, motivation, and commitment.
- The use of collaborative methods raised the level of output legitimacy.
- The iterative approach helped to balance internal political and stakeholder interests by enhancing the coordination (esp. by feedback loops incorporating GB and stakeholders).
- The overall process provides added value as it bears the potential to build up sustainable stakeholder networks (esp. combined with the SEiSMiC NaNets) by introducing a starting point for (in-)formal networks. The introduction of the new body “Stakeholder Involvement Platform”²³ (SIP; at planning stage) will provide the answer whether the project can take advantage of this network potential in practice.

It has to be noted, however, that the *downsides of co-creation* are its long duration, the demanding project management, and its resource-intensity. It furthermore builds upon the partly fragile motivation of stakeholder groups that are only temporarily involved and whom JPI UE cannot offer an appropriate compensation for their efforts at the moment.

Consequently, this process design implies possible *pitfalls* with respect to scarce resources, management failures, stakeholders’ loss of interest, the offering of adequate incentives as well as their - even though rather low in this case - conflict of interests. Above this, Co-creation processes can potentially fail at every stage of the process due to the experimental and open approach. In this context, the managements’ task to balance bottom-up and top-down formats proved challenging.

3.3.2 Key factors of success

All interviewees confirmed after finalisation of the SRIA that it paid off to start the co-creational ‘adventure’ and face the downsides and pitfalls mentioned above. According to the interviewees, the key factors of success are:

- *Centralized management*

The well-run management seems to have its roots in a MB team working hand in hand, its low man-

²² In this context, the involvement of practitioners and local actors turned out to be of utmost importance in regards to their practice experience and high interest in the implementation of the research results. Formal representatives are indispensable as multipliers but often feature a low degree of commitment due to limited time resources.

²³ The Stakeholder Involvement Platform will be an advisory platform formed by stakeholders and ensuring public support for the initiative. It is a core panel representing all stakeholder groups with sufficient regional spread across Europe.

agement staff turnover. Moreover, the MB and GB members supported patiently the long lasting SRIA development process.

It proved advantageous that the chair of the MB took over personal responsibility to steer the process by carrying out a targeted management of the complex process and by fostering cooperation among formal bodies and stakeholder groups. Internally, the chair of the MB was the ‘conductor of the orchestra’, and externally, the ‘face’ of JPI UE. According to the interviewees, the clear vision, enthusiasm, and strategic focus of the chair were key for the SHI management performance and the JPI’s credibility among stakeholders.

- *Consideration of process dynamics and ‘moving targets’*

The Co-creation process’ inherent dynamics and ‘moving targets’ resulted in a continuous reflection and re-evaluation of the next steps. Therefore, the process design has been adapted constantly to emerging new circumstances and challenges. In this respect, the organisational and methodological knowledge was as important as expert knowledge in change management and organisational development.

- *Continuous management of stakeholder relationships²⁴*

The credibility of the SRIA development process is critical for a sufficient (and sustainable) commitment of stakeholders. The risk of SHI activities being regarded as a ‘fig leaf’ for legitimacy results in the necessity to build up trust from the very beginning. Reciprocity in terms of mutual give-and-take seems to be crucial to pave the way for credibility and to establish trust.

A crucial key factor of success might be the establishment of incentives for stakeholders (beyond giving them a voice) who dedicate time and effort: a concept of an appropriate (tangible or intangible) compensation is therefore required.

According to interviewees, the secretariat members perceive themselves as facilitators and ‘service providers’ who reply to the stakeholders’ needs as a matter of course. The JPI management team seems to have internalized the concept of reciprocal exchange as a part of the organizational values and implements them in practice.

Another result of continuous stakeholder management might be the engagement of the SAB members and its chair who made a substantial contribution to the SRIA development which exceed their usual tasks.

3.3.3 Replicability

The Co-creation process bears a great potential - but it is not a ‘one-size-fits-all’ approach: there are several prerequisites in regards to the JPI’s stakeholder profile as well as to its management that need to be considered. The most striking are:

- *Stakeholder community*

The Co-creation approach seems to be particularly beneficial for JPIs featuring a heterogeneous stakeholder environment with rather low conflict of interest: it helps to address heterogeneity of

24 Durham E., Baker H., Smith M., Moore E. & Morgan V. (2014). The BiodivERsA Stakeholder Engagement Handbook. BiodivERsA, Paris (108 pp).

stakeholders by integrating a wide range of interdisciplinary, multi-level, and cross-system perspectives. A strong conflict of interest (implying different aims and visions among stakeholders) can be a burden for the whole process as a common vision is the motivational element of this approach. In general, it seems advantageous to capture the stakeholders' attitude in the course of the dynamic process. The implementation of a formative evaluation is therefore recommended.

- *Process management*

The centralized process management was based on a strong leadership. In the case of replication, it is recommended that either a single person or a small steering group in the MB is responsible. According to the interviewees, the importance of the human factor is outstanding. Some mentioned key features of this position are target orientation, strong leadership, and enthusiastic attitude towards the whole process. The position's responsibilities can theoretically be split, e.g. in an operational and a strategic position or in an external/representative and an internal/management task field. The whole process management requires considerable staffing resources and time.

- *Professional adaption*

A tailor-made setup of the process design is inevitable and professional advice is recommended. If an implementation expert is involved, this person will be part of the learning process in order to respond to process dynamics and provide access to methodological as well as organisational knowledge. During the planning phase, the role of the internal or external expert is to setup a design that mirrors the intensity of perused SHI and accounts for the complexity of the JPI-specific stakeholder environment, e.g. aspects of multi-level and cross-system characteristics.

3.4 Conclusions

As stated at the beginning, the stakeholders are the 'backbone' of JPI UE. According to the interviewees, the Co-creation approach has kept the management "on the right track" within a dynamic stakeholder environment. Above this, the approach bears considerable capability to establish the nucleus for sustainable (in-)formal networks whose stakeholders are potential implementation partners in future. In the case of JPI UE, this network potential is supposed to be transferred to the new "Stakeholder Involvement Platform".

Although the Co-creation approach is resource-intense in terms of budget and staffing, the results and its added value outweigh these efforts. The major issue raised is the sustainable commitment of the stakeholders: appropriate incentives and direct benefits are required, e.g. the guarantee that their work results in concrete research projects or monetary compensation.

Overall, we recommend the application of Co-creation approach for the revision of the SRAs/SRIAs as one element of SHI - provided that a professional setup addresses the needs of distinct JPI characteristics.

4 Identification of Future Research Needs: JPI Oceans Explores the Potential of Foresight Exercises

Seas and oceans are the largest underexplored territory on earth and its knowledge gaps as well as its technological challenges are so wide that they require concerted effort at European level. The Joint Programming Initiative Oceans (JPI Oceans) responded to the research area's ambiguity and broadness of scope: JPI Oceans embedded foresight from the start as a tool to identify future research needs, challenges and solutions.²⁵

This case study is particularly interesting for practitioners who are interested in the implementation of foresight activities in their JPI, e.g. as a tool to update their Strategic research (and innovation) agenda (SRA/SRIA) or to develop research agendas in a scientific area with significant underexploration or high uncertainty.

In order to grasp the case's backdrop, we firstly introduce the JPI Oceans' aims and its general stakeholder involvement strategy. We then present the conceptualisation of strategic and thematic foresight plus insight into the implementation of a test run in the field of microplastics. We finally derive key benefits, key factors of success, and the potential of foresight exercises for other JPIs.

4.1 Background and Ambition

4.1.1 The Aims of JPI Oceans

The JPI's vision and mission statement emphasizes that Europe needs to "realise the potential of its underexplored seas and oceans while addressing the environmental and climate change challenges". Europe shall furthermore "ensure the sustainability of existing maritime activities and turn the unexploited potential of seas and oceans into sustainable growth". The JPI Oceans is said to be the only existing high-level strategic mechanism to provide an integrated European approach to investing in cutting-edge and innovative marine and maritime research. JPI Oceans therefore aims at consolidating and integrating knowledge across all marine-maritime sectors²⁶ and to "provide member countries with a vision and a strategy at political level on oceans and seas across the sectors and disciplines which provides an impetus for science to move and take activities forward".²⁷

The JPI's grand challenge results from the immense human impact on seas and oceans that is manifold and affects its general strategy. Firstly, the wide range of topics and challenges can only be tackled with an *integrated, interdisciplinary and cross-system* approach. Secondly, the vast underexploration of seas and oceans as well as the high probability of relevant threats and opportunities are not identified so far which implies the need of *open and explorative approaches* to detect relevant research areas.

25 Vision Document – JPI Healthy and Productive Seas and Oceans. <http://www.jpi-oceans.eu/library?refid=239556>

26 Vision Document – JPI Healthy and Productive Seas and Oceans. <http://www.jpi-oceans.eu/library?refid=239556>

27 Interviewee JPI Oceans

4.1.2 The General Stakeholder Involvement Strategy

The stakeholder environment of JPI Oceans is very dynamic and broad in scope: new research communities, business associations, and NGOs structured the environment over the last years at regional, national, and European level. Numerous initiatives have been evolved in the field of marine research, although often in a fragmented way. These conditions reinforce JPI Oceans' integrated approach with respect to its general stakeholder involvement strategy (SHI): a *broad range of disciplines, sectors, and policy levels* is to be considered.

As a rather new organization, JPI Oceans faces the need of building up legitimacy in order to become a respected key player in this research field - for both member countries and its expanded circle of stakeholders. JPI Oceans is considered to be a significant partner since it "gives a voice to research" by "a strong political and institutional framework to act within which gives direction"²⁸ and the opportunity to attract a critical mass.

The JPI Ocean's major SHI activities are, besides one-directional communication and dissemination activities²⁹, the development of the SRIA and the implementation plan in collaboration with the Strategic Advisory Board (StAB), including a series of stakeholder workshops to which more than 150 organisations were invited and an open online consultation, as well as the thematic foresight test run.

We derived the following characteristic principles of stakeholder involvement:

- SHI activities are initiated top-down by the Management Board (MB), ensuring that objectives and the overarching aim is met. The SHI activities also feature bottom-up elements, ensuring the openness for new ideas, partnership at eye level, and accounting for the active and independent role of stakeholders. Consequently, the SHI strategy aims in general at *higher levels of stakeholder involvement*³⁰.
- JPI Oceans pursues an *activity-based and problem-oriented stakeholder involvement* that mainly focuses on the temporary involvement of few selected stakeholders (apart from the continuous dialogue with key stakeholders and collaboration with the StAB). With respect to applied tools and selection of involved stakeholders, the JPI's follows a pragmatic "*fit for purpose*" SHI strategy.
- Stakeholders are considered to be independent partners at eye-level who shall be empowered to play an active part. Hence, the assigned *role of stakeholders* is to support JPI activities with a high degree of latitude and, at best, build up (in-)formal networks around an activity/research area. Therefore, JPI Oceans aims to involve a rather small amount of highly relevant key stakeholders out of a broad range of disciplines and sectors. With respect to continuous SHI, the

28 Interviewee JPI Oceans

29 [„Communication plan“ PDF](#)

30 See figure 3 in annex; according to the interviewees, there is a pronounced fatigue towards involvement activities at the lower levels of stakeholder involvement such as one-dimensional information (e.g. conferences).

stakeholders in the StAB obtain an advisory function and a constant dialogue with key stakeholders is maintained (e.g. European Marine Board).

The integrated stakeholder board of JPI Oceans

As the decision-making body, the MB represents all participating member countries and has the overall responsibility for the implementation of JPI Oceans (see organizational structure; figure 4 in annex). The representatives have sufficient authority to agree on joint action plans and potential funding initiatives across Europe. The executive committee, a subset of the MB, advises the secretariat and provides support to the MB. The secretariat is committed to facilitating and supporting the work of the executive committee, the MB and the StAB.

The JPI Oceans has one formal body for its stakeholders, the integrated StAB. Its 14 representatives of (mainly) academia, industry, and the policy-making community mirror the the integrated overall strategy of JPI Oceans by this triple helix approach. The interdisciplinary and cross-system stakeholder groups are working in one formal body, the StAB, and is made up of independent experts, each one appointed by the MB in their own capacity³¹. The StAB provides independent, integrated, and strategic advice to the MB, their members obtained a consultative role during the development of the SRIA as well as the StAB proposes and assesses joint actions.

Along the lines of systems and disciplines, the heterogeneity of the StAB has been an issue as, referring to interviewees, they “do not speak the same language” which results in diverse expectations of stakeholders towards the JPI’s actions resulting in mutual scepticism. Thus, JPI Oceans currently tests new ways of organizing its stakeholder board.

4.1.3 Exploring New Avenues: Foresight as Means to Identify Future Research Needs

JPI OCEANS responded to the uncertain conditions of the research area and its broadness of scope by embedding foresight (see GPC’s Guidelines on Framework Conditions³²) from the start as an innovative approach aiming at identifying possible future scenarios, challenges and solutions. The foresight approach was developed in a dedicated work package in the first Coordination and Support Action for JPI Oceans (CSA Oceans 1). The foresight activities of CSA Oceans 1 aimed at conceptualisation of strategic and thematic foresight as well as implementing a foresight test run³³ with the foresight expert KDM (German Marine Research Consortium).

JPI Oceans published several deliverables describing their achievements in regards to foresight activities within a JPI; we want to emphasize the relevance of (1) Foresight for JPI Oceans - Definition and review

31 <http://www.jpi-oceans.eu/about/governance/strategic-advisory-board> (retrieved 21th of April 2016)

32 European Union (2011). Voluntary Guidelines on Framework Conditions for Joint Programming in Research in 2010. Luxembourg: Publications Office of the European Union.

33 A Foresight Process for JPI Oceans – A Final Recommendation (2012). <http://www.jpi-oceans.eu/library?year=&Field=foresight+final+recommendation#main>

of relevant processes (2012), (2) A Foresight Process for JPI Oceans – A Final Recommendation (2012), and (3) Foresight Exercise Test Run Experiences from the field of Microplastics (2015).

As the review of existing forward-looking activities has revealed, no foresight process exists to date in Europe which examines future research needs and priorities “in a continuous, participatory and integrated manner”. Embedding the foresight approach into activities and as a means for stakeholder involvement, could position JPI Oceans in a pioneer role about European marine research and become an important player in European high-level strategy process.³⁴ The foresight approach has the potential to provide a valuable step towards a stakeholder involvement strategy that integrates selected actors around a scientific area from the beginning which matches the overall strategy of JPI Oceans.

4.2 The Approach

4.2.1 Definitions and Theoretical Backdrop of Foresight Exercises

JPI Oceans refers in their initial document “Foresight for JPI Oceans - Definition and review of relevant processes (2012)” to a definition that characterizes foresight as a *medium-to-long-term vision-building process* (see info box).

Definition of Foresight

Foresight is a systematic, participatory, future intelligence gathering and medium-to-long-term vision-building process aimed at present-day decisions and mobilizing joint actions [...] Foresight involves bringing together key agents of change and sources of knowledge, in order to develop strategic visions and anticipatory intelligence.

Of equal importance, Foresight is often explicitly intended to establish networks of knowledgeable agents, who can respond better to policy and other challenges.

FOREN. 2001. A Practical Guide to Regional Development. Seville: European Communities.

Foresight exercises exhibit considerable differences due to the large amount of variables in the design of the process. Three general distinctions³⁵ can be made between exercises regarding the desired objectives, the way these objectives are achieved, and the methods applied (for more information, please see definitional document):

- product-orientation vs process-orientation
- top-down vs bottom-up approach
- exploratory vs normative methods

³⁴ Foresight for JPI Oceans - Definition and review of relevant processes (2012). <http://www.jpi-oceans.eu/library?refid=239553>

³⁵ These distinctions are not dichotomies but matters of degree and, thus, serve as a general orientation.

The identification of the most efficient kind of foresight that suits best its purpose requires careful and professional analysis beforehand (see below).

The backdrop of the JPI Oceans' process design is the recognition and application of the “five elements of foresight”³⁶: (1) systematic future intelligence-gathering, (2) interactive and participative process, (3) building networks of knowledge agents, (4) generation of common visions for the future and (5) present-day strategic decisions and joint actions. These elements play a major role when designing the theoretical framework of a foresight approach adapted to the needs of JPI Oceans.

In general, foresight processes seek to actively involve relevant stakeholders to debate the strategic and thematic long- and medium-term orientation, e.g. by creating a roadmap in specific themes for joint programmes. Recognised experts are involved to raise awareness, legitimacy and reach key stakeholders. Methods used aim at high levels of involvement in order to build up commitment towards the project, trust among participants, and the feeling of community.

In the following, two concepts of foresight developed by JPI Oceans and KDM are presented: the strategic foresight supports the update of the SRA/SRIA and the thematic foresight approach is defines new and further develop specific research areas or actions³⁷.

4.2.2 Conceptualization of Strategic Foresight

According to the definitional report³⁸ of JPI Oceans and KDM, the SRAs/SRIAs have “similar objectives to foresight: identifying future challenges and the necessary steps to tackle them. However, the process of their development is often not one of foresight [...] as they lack, for instance, participative or multidisciplinary elements.”³⁹ As stated in the JPI Oceans' vision, foresight can be a tool to turn the SRA/SRIA into a “living document”, provide valuable inputs to the MB and feed the SRA/SRIA throughout the whole life-cycle of the JPI. Strategic foresight is usually not a single event, but a long process embedded in the wider strategic decision-making context.

So far, there is no experience gathered with strategic foresight⁴⁰ since the JPI Oceans' conceptualization was designed to feed into the update of the SRIA in the future, rather than its first development. The ideal-typical presentation by Joseph Voros (see figure 1) serves as a preliminary model to put the revision of a SRA/SRIA into practice— provided that it is accounted for adequate adaption to fit the JPI's needs, challenges, and stakeholder environment.

Figure 1: The phases of Strategic Foresight

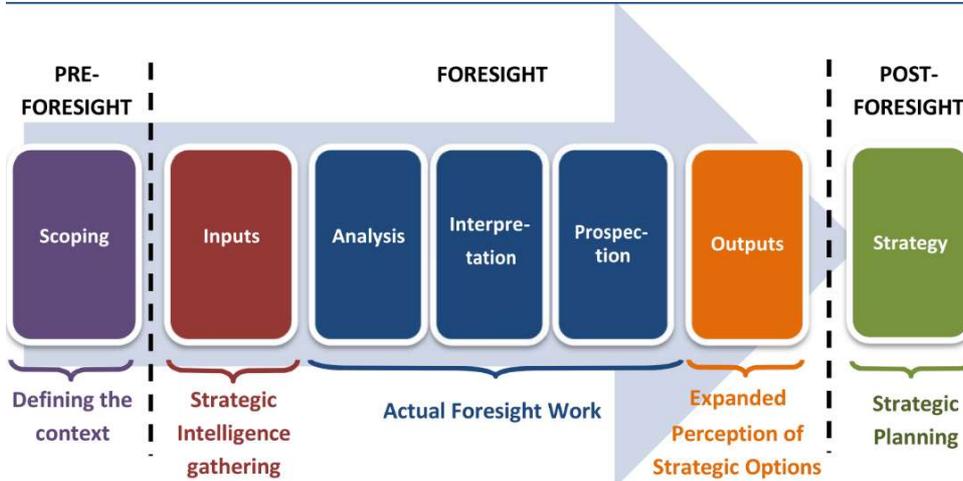
36 Foresight for JPI Oceans - Definition and review of relevant processes (2012). <http://www.jpi-oceans.eu/library?refid=239553>

37 A Foresight Process for JPI Oceans – A Final Recommendation (2012). <http://www.jpi-oceans.eu/library?year=&Field=foresight+final+recommendation#main>

38 Foresight for JPI Oceans - Definition and review of relevant processes (2012). <http://www.jpi-oceans.eu/library?refid=239553>

39 Foresight for JPI Oceans - Definition and review of relevant processes (2012). <http://www.jpi-oceans.eu/library?refid=239553>

40 apart from rather rudimentary forward-looking methods as part of the development of the SRIA



Source: adapted from Voros, Joseph. 2003. "A generic foresight process framework", foresight Vol. 5 (3): pp. 10-21.

According to the model, three different phases of foresight are identified for the update of the SRA/SRIA:

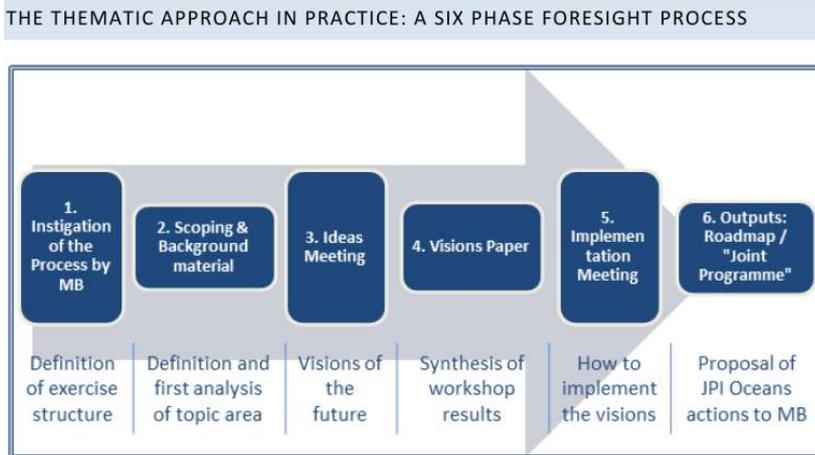
1. Pre-foresight: Scoping and designing the foresight process with expert advice.
2. Foresight:
 - a. Gathering inputs of strategic intelligence about future trends and developments.
 - b. Foresight work encompasses the analysis and interpretation of intelligence and its subsequent prospection into the future (considering alternative futures).
 - c. Tangible and intangible outputs of revealing an expanded perception of available options are generated.
3. Post-foresight: Implementation of future strategy with respective actions and measures by relevant policy- and decision-makers on the basis of the foresight work.

4.2.3 Conceptualization of Thematic Foresight

The thematic foresight approach can either define emerging research topics or further develop scientific areas and actions. The output of this type of foresight can be a sort of roadmap or proposal with concrete future actions. Aims of thematic foresight exercises can be (1) the development of implementation plans for strategic areas of the SRA/SRIA, (2) embed existing actions (e.g. pilot actions) in a long-term strategy and (3) investigate emerging new issues and make recommendations for transnational activities.

JPI Oceans published “A Foresight Process for JPI Oceans - A Final Recommendation” presenting an operational plan of an ideal-typical thematic foresight process that provides valuable input and inspiration for successors of other JPIs⁴¹.

Figure 2: The six phases of a thematic foresight process



Source: JPI Oceans - Final recommendation for a Foresight Process for JPI Oceans

In theory, the ideal-typical thematic foresight procedure passes through six phases⁴² over a time span of approximately 12 to 18 months (for more details, see annex: “Six phases of thematic foresight”).

Governance of a foresight process

A foresight steering committee is established for each foresight process. Its members are nominated by the MB and supported by the secretariat⁴³. The committee consists of one member of the MB, one member of the StAB, and an external expert. The MB instigates the foresight process while the committee manages it and the secretariat obtains an administrative role.

Figure 3: Organisational structure of the foresight process

41 A Foresight Process for JPI Oceans – A Final Recommendation (2012). <http://www.jpi-oceans.eu/library?year=&Field=foresight+final+recommendation#main>

42 However, the foresight process does not necessarily pass through all six phases in such order, if the Foresight Steering Committee (see below) considers it to be advantageous to modify the proposed process.

43 The member of the Secretariat will assume the responsibility of all administrative and facilitating tasks. This may include the organisation of the workshops, the writing of meeting reports, as well as the drafting of the preliminary background material.



Source: A Foresight Process for JPI Oceans – A Final Recommendation (2012).

The tasks of the three foresight steering committee members encompass:

- The MB member takes on the responsibility for the management of the project and has to ensure that the process fulfils the agreed objectives (including project schedule and budget).
- The StAB representative has the responsibility to advice on the scientific and societal relevance of the process. This comprises advising on the participants selected and the methods employed.
- The external expert(s), nominated by the MB, have the responsibility to ensure the quality of the content of the exercise. Specifically, the external expert(s) should assist in tailoring thematic foresight process design, assist in identifying workshop participants, gather strategic intelligence / inputs for the exercise, hold the workshops, and draft visions paper and roadmap.

4.2.4 Test Run in the Field of Microplastics

According to the interviewees, the test run was actually initiated as an “emergency”: this newly evolving research field implied the high uncertainty ‘how big’ it in fact is. These circumstances resulted in the decision to break new ground by applying the – already prepared - innovative and experimental thematic foresight concept.

The recommendations of the thematic foresight concept was used to develop a test run on microplastics, carried out between June 2013 and October 2014⁴⁴. The project’s aim was to outline current trends and challenges of the new research area in order to identify future research priorities and develop a roadmap for microplastics research for Europe. The test run shall furthermore provide input and lessons learned for prospective upscaling of foresight projects.

According to the “three general distinctions” of foresight designs (see section 3.1) – i.e. the desired objectives, the way these objectives are achieved, and the methods applied - the thematic approach, at least in the case of microplastics, is *demand-driven* and features a *product-orientation*. JPI Oceans’ MB

44 JPI Oceans - Foresight Exercise Test Run Experiences from the field of Microplastics 2015 <http://www.vliz.be/imisdocs/publications/269691.pdf>

initiated the project in a *top-down* manner by setting the topic and the framework as well as deciding on the implementation of the results.

Approximate resources for similar thematic foresight exercises

- *Duration in months: 6-9*
- *Budget: 20.000-30.000€*
- *Man months: 3-6*

Please note: figures depend on whether reports are drafted in-house, incentives required, and external advisors hired; if JPI is well established, incentives for participants (such as travel expenses) might be optional.

The test run's implementation - Insights into practice

The baseline procedure presented in section 3.3 was largely adapted in practice. This section depicts its concrete peculiarities by the six phases permitting concrete insights plus presenting the test run's output and outcome.

The MB instigated the test run putting the already prepared thematic foresight concept into practice (phase 1). Since JPI Oceans is operating on the basis of variable geometry, member countries willing to participate in the foresight exercise chose different levels of engagement. The minimum involvement for participating countries is to nominate one national contact point. The member countries' representatives moreover assisted in the identification of potential participants at the national level.

In order to create a common understanding and a starting point among the participants for the workshop discussions, an interdisciplinary background paper was drafted (phase 2). Thereafter, national experts nominated by member countries were invited to the "Ideas Meeting" workshop and complemented by further experts to broaden the diversity of the participants. In total, 19 experts in the field of microplastics participated, representing academia (mainly), industry, civil society and the policy-making community (phase 3). The workshop was split into three sessions (including methods such as small break-out groups and plenary discussions): The first session elucidated why microplastics in the oceans are of societal concern. The second session aimed to analyse the main trends and challenges related to microplastics until the year 2035. On the basis of this analysis, the third session identified and prioritised research areas.

An expert of KDM drafted the Visions Paper (phase 4) being the starting point for the development of the proposal. The second workshop "Implementation Meeting" (phase 5) did not take place: the interviewees emphasized that a second full workshop was not essential in this foresight procedure as the research priority recommendations were better presented to the member countries in a meeting. (Besides, some experts were reluctant to participate in a second workshop without a good prospect of benefits [such as the implementation of joint actions]). This highlights the need of a concrete incentive for stakeholders in order to maintain their commitment. The expert of KDM drafted the proposal with concrete recommendations for future research in the field of microplastics in consultation with the workshop participants.

The MB adopted and implemented the proposal's recommendations (phase 6) resulting in a joint call on

microplastics. Further outcomes were a workshop on foresight exercises and the stimulation of networking activities: according to interview partners, the foresight's "Ideas Meeting" workshop with its collaborative methods helped to build up a "microplastic identity" within one day leading to strong group dynamics and an emerging informal network. After the workshop, many participants jointly submitted a proposal for Marie Skłodowska-Curie network.

4.3 Key Results and Achievements

The overall assessment of a thematic foresight exercise, as it was carried out in the test run on microplastics, is largely encouraging: according to the good experience of the test run and the positive feedback received from the participants, the CSA Oceans project recommended further foresight exercises to develop its activities and long-term strategies for research in Europe. Its successor CSA OCEANS 2 (operational since February 2016) includes strategic foresight as a workpackages, e.g. to update the SRIA and further thematic foresight or other forward looking activities.

4.3.1 Key Benefits

1. Superior output quality and radical shifts in thinking⁴⁵

- Involvement of *international, cross-system, and interdisciplinary participants trigger thinking "out of the box"* by combining their heterogeneous perspectives. Moreover, it can strengthen the research area's multidisciplinary research community.
- The *collaborational working modality* of foresight methods with its Co-creation and Co-production approaches can produce *radical shifts* in thinking and of ideas leading to a superior output quality.
- The approach's heterogeneous participants and collaborative methods are particularly helpful to analyse the *opportunities of future emerging technologies and its limitations*.

2. Network building at multiple levels

- A foresight's collaboratively created vision can *create a new 'identity'* and commitment of the participating stakeholders as the test run showed: community spirit and the feeling of 'ownership' was observed after the first workshop (initiated by bottom-up exercises⁴⁶).
- Positive external network effects in regards to the research community were observed in the test run: the emergence of *collaborations between partners across systems* and new activities around common research interests.

45 cf. Amanitidou, Effie (2008). 'Joint Foresight': towards a mechanism for joint programming in Europe? foresight Vol. 10 (6): pp. 103-117.

46 Brummer, Ville, Totti Könnölä and Ahti Salo. 2008. "Foresight within ERA-NETs: Experience from the preparation of an international research program", Technological Forecasting & Social Change Vol. 75: pp. 483-495.

- Presenting a well-elaborated vision and roadmap of a research area by distinguished experts can potentially lead to both a *higher legitimacy* of the pursued actions and a *higher recognition of JPI Oceans* in this field being considered as an important player and *network hub*.

3. Alignment of national research systems and agendas

- The joint process can *facilitate and inform strategy-making processes* at national level as a two-way interaction.⁴⁷
- The foresight's development of joint visions and the identification of relevant future research topics is a first step towards the alignment of *national research agendas*.

4.3.2 Key Factors of Success

1. Financial and political commitment by member countries⁴⁸

The open method of coordination results in the challenge to attract backing for aspired actions: according to the interviewees, a close consultation with member countries as backers was key. As reciprocity is highly relevant in this context, JPI Oceans' aim is to enable member countries to both 'upload' their national interests and priorities to the European level within the foresight procedure as well as to receive or 'download' input and ideas for the formation of national strategies.

Political priorities are ensured by the organisational structure of the foresight steering board and the member countries' assigned task to nominate national stakeholders⁴⁹. Above this, it proved advantageous to enter close consultations with the MB at an early stage in order to guarantee financial and political commitment by member countries from the start.

2. Significant incentives for participating stakeholders

During the foresight process, the challenge arised to build up commitment among workshop participants (see section 3.4): although stakeholders stated that it was an "interesting experience" to attend a foresight workshop, from their perspective, a concrete incentive (auch as a guaranteed joint call) was missing (this lack of reciprocity contributed to the reluctance to take part in the second workshop).

3. Professional support by foresight expert(s) and internal expertise

A careful appointment of external foresight expert(s) is crucial for an adequately implemented foresight exercise. The nomination of the expert(s) - either in an advisory or an executive role - gives legitimacy to

47 cf. Haegeman, Karel and Totti Könölä (2012). "Embedding foresight in transnational research pro-gramming", Science and Public Policy Vol. 39: pp. 191-207.

48 JPI Oceans - A Foresight Process for JPI Oceans – A Final Recommendation (2012). <http://www.jpi-oceans.eu/library?year=&Field=foresight+final+recommendation#main>

49 The involvement of interministerial organisations proved particularly advantageous.

the project and helps to mobilise support for the process. The expert(s) shall provide access to methodological as well as organizational knowledge and be part of the learning process in order to respond to the process dynamics.

Another key issue is the currently missing internal knowledge and expertise in most JPIs. A central knowledge base with practice-oriented learning material and a foresight training of interested JPI members can build up the expertise needed to identify potential foresight topics as well as estimate the extent and cost-benefit ratio of an appropriate foresight exercise.

4.3.3 Replicability and Recommendations

Strategic and thematic foresight exercises bear great potential for JPIs - but it is not a 'one-size-fits-all' approach. It has to be noted, that the downside is its resource-intensity and a noteworthy pitfall is its open and experimental character that can theoretically lead to imponderables in every phase of the process. There are various kinds of prerequisites in regards to the JPI's general characteristics and its stakeholder profile that need to be considered beforehand:

- For both types of foresight applies: the more *underexplored, uncertain, and interdisciplinary* the research area in question is, the higher the potential of a foresight exercise.
- *Thematic* foresight (usually implemented as a one-off exercise) is particularly meaningful for new research topics whose future is vague due to cross-sectoral influences, high amount of critical drivers, and trends with consequences difficult to assess.
- Continuous *strategic* foresight seems to be a promising approach for JPIs that plan to update their SRAs/SRIAs since it offers added value in regards to a) a higher level of content-related quality, b) enhanced legitimacy due to the participatory approach, and b) emerging and strengthened stakeholder networks in which the JPI might become a key player as a network hub in future as a process benefit.
- The JPI shall ensure a) the political and financial commitment by the member countries, b) significant *incentives* for participating stakeholders, and c) a *professional adaption* by foresight expert(s).
- *Building up the knowledge* to run a foresight process is resource-intense: JPI Oceans experienced a long preparation time, however, the conceptualisation resulted in considerable material for other JPIs interested in setting up a foresight exercise (see in particular the theoretical framework in the definition report⁵⁰ and Lessons Learned of the test run⁵¹).

50 JPI Oceans - Foresight for JPI Oceans - Definition and review of relevant processes (2012). <http://www.jpi-oceans.eu/library?refid=239553>

51 JPI Oceans - Foresight Exercise Test Run Experiences from the field of Microplastics 2015 <http://www.vliz.be/imisdocs/publications/269691.pdf>

A starting point for foresight exercises

- The “Definition and review of relevant processes” identifies and reviews major foresight processes and activities in the European marine and maritime field. Furthermore, it provides basic definitions. This document is in particular interesting for readers who want to assess the potential of this approach for their JPI.
- The document “A foresight process for JPI Oceans: a final recommendation” develops a transparent, inclusive, effective and efficient framework for identifying the key future themes and challenges
- The “Foresight Exercise Test Run Experiences from the field of Microplastics” provides insight into concrete implementation and its lessons learned.

4.4 Conclusions

JPI Oceans broke new ground when implementing foresight procedures. Overall, the application of thematic foresight suits the JPI Oceans’ prerequisites very well, notably its underexplored research landscape, its activity-based and problem-oriented SHI strategy as well as its stakeholder environment with a broad range of disciplines, sectors, and policy levels.

The open and participatory foresight approach created meaningful knowledge and shows the JPI community the capabilities of foresight exercises. Moreover, its potential to align national research agendas and to become a key player in this research area is noteworthy. As a rather new initiative operating in a crowded scientific landscape - given the abundance of organisations with a focus on marine and maritime research - JPI Oceans still needs to demonstrate its added value to its own members and the wider community and foresight: as a distinguishing feature, foresight exercises can help to achieve this external attestation in future.

Foresight is not an end in itself: as this kind of exercises are resource-intensive, JPIs shall weigh carefully in a purpose- and problem-oriented way whether and how they want to implement such activities. A crucial barrier might be the internally missing expertise: a significant driver to improve the cost-benefit ratio is the pooling of foresight expertise, e.g. by a centralised knowledge base with practice-oriented learning material and foresight counselling, foresight trainings, and space for exchange of expertise among JPI members.

5 Bridging the gap towards Innovation: the Water JPI Activities on Stakeholder Involvement⁵²

"Achieving Sustainable Water Systems for a Sustainable Economy in Europe and Abroad" is the ambitious vision of the JPI on water challenges for a changing world (Water JPI). Water JPI objectives address the need for increased coordination in European water related Research, Technology Development and Innovation (RTDI) and in the use of funds; for progress in the integration of RTDI agendas and issues such as user/stakeholder involvement for effective uptake of RTDI results as well as supporting European science and technology leadership.⁵³

One of the main success factors for Water JPI is the involvement of stakeholders, particularly innovation-driven end-users (i.e. economic sector⁵⁴ respective water suppliers and utilities). The strong need to involve stakeholders and end-users is at the heart of each JPI when facing a grand societal challenge.⁵⁵

In this case study we describe and analyse how the Water JPI addresses this complex challenge of stakeholder involvement (SHI) throughout the policy cycle of a JPI with different activities and instruments.

This case study is particularly interesting for JPI practitioners who are interested in stakeholder related activities within the governance structures of JPIs (ensuring representation from different stakeholder groups across the different member countries) and activities which aim at speeding up policy-making and market-uptake, because "bridging the gap towards innovation" is crucial for generating impact and assuring sustainability of JPIs.

5.1 Background and ambition

Water JPI has committed itself to build interfaces with society and to pursue a broad participatory approach to water challenges and needs. It aims at speeding up RTDI results uptake and therefore strengthening the links between Water science, policy and industry. A key responsibility of the Water JPI is to make sure that it addresses issues of public interest, and that RTDI results are made accessible

⁵² The case study is based on different sources: official documents of the JPI and the GPC, presentations of Water JPI representatives at P2P partnership meetings, information from the web page as well as comprehensive empirical information stemming from the consultation of three JPI representatives* as well as from a workshop held on SHI in January 2016 at the ERA learn Conference in Brussels.

* The author would like to express his gratitude particularly to Dominique DARMENDRAIL from the JPI Water coordination. Her kind support was very helpful for drafting this case study.

⁵³ See also: "Planning Document on Water JPI activities, instruments, management and procedures", p. 7 and 10;

Link: http://www.waterjpi.eu/index.php?option=com_content&view=article&id=75&Itemid=688

and "Water JPI Implementation Plan 2014/2016", p. 3 and 5; Link: http://www.waterjpi.eu/images/WaterJPI/Implementation_2014_web.pdf

⁵⁴ The Water economic sector covers public and private enterprises; a specificity of the water economic sector

⁵⁵ See also: Evaluation of Joint Programming to Address Grand Societal Challenges (2016), p. 28 and 29;

Link: <https://www.era-learn.eu/publications/ec-publications/evaluation-of-joint-programming-to-address-grand-societal-challenges-final-report-of-the-expert-group>

through appropriate dissemination and stakeholder involvement activities. This means that the JPI requires to respond to the needs of policy, decision makers, innovation-driven end-users and European society at large, which is understood as an essential part of Water JPI activities.⁵⁶

This commitment to proactively involve stakeholders in the different phases of the JPIs implementation and “life-cycle” is closely related to the objectives of the Water JPI.

5.1.1 Objectives of the JPI and Fields of Activities

Based on the vision, the Water JPI has a set of objectives. These objectives, measured by particular indicators, are.⁵⁷

- Reaching effective, sustainable coordination of European water RTDI;
- Harmonizing National water RTDI agendas and activities in Partner Countries;
- Attaining critical mass of research programmes;
- Involving water end-users for effective RTDI results uptake; and
- Supporting European leadership in science and technology.

In order to achieve the Water JPI objectives, three types of core activities have been defined in this Initiative. In all of these activities, stakeholder involvement takes place.⁵⁸

1. Improving the efficiency of RTDI programmes: These activities will optimise internal procedures and will foster the alignment of existing national strategies and programmes (e.g. through the definition of a Strategic Research and Innovation Agenda (SRIA))
2. Interfacing with society: These activities shall lead to a broader participatory approach to water challenges and needs and strengthening the links between water science, policy and Economic sector. (e.g. through JPI events and stakeholder workshops)
3. Empowering RTDI actors: These activities target researchers, technologists and innovators from public and private institutions (e.g. through support services and joint activities with key-stakeholders)

5.1.2 Definition and Targets of Stakeholders Involvement

There is no “formal”, official definition of stakeholders in Water JPI, but following JPIs documents (e.g. Terms of Reference, Vision Document, SRIA and mapping documents) a stakeholder in the Water JPI

⁵⁶ See also: “Planning Document on Water JPI activities, instruments, management and procedures”, p. 16

⁵⁷ See also: “Water JPI Implementation Plan 2014/2016”, p. 3 and 5

⁵⁸ *ibid.*

can be understood as a *person, group or organisation / institution which has a (pro-active) interest in water resources.*

Coming from this broad definition, stakeholders are involved by the Water JPI in all phases of the JPI policy cycle with a broad set of instruments. Depending on the particular group of stakeholders relevant for the specific activity/task of the JPI, and depending on their interests and capacities to participate, stakeholders shall contribute to the following, *particular targets* along the phases of the JPI⁵⁹:

- to provide advice to the Governing Board (GB) and the Management Board (MB) on specific issues on demand,
- to identify innovative alternatives suitable for decision-making,
- to participate in Water JPI activities like SRIA development and joint actions,
- to identify problems, gaps in EU and National water RTDI programmes,
- to support the harmonisation of national water RTDI programmes,
- to contribute to overcome fragmentation of the water sector,
- to facilitate dialogue with different communities, and engage directly with practitioners and relevant stakeholders in the development of the applications and tools delivered by the project, and
- to disseminate and support the uptake of project outputs / results to selected relevant communities and transfer results into business opportunities

To do so in practice, a comprehensive and ambitious stakeholder approach was incorporated which will be described in the following sections.

5.2 The Approach

This section details the approach for the implementation of Stakeholder Involvement in Water JPI.

5.2.1 Main Instruments and Formats for Involvement

The Water JPI defined a set of instruments that shall be of high relevance and benefit regarding the achievement of the objectives of the Water JPI and the particular SHI targets, as sketched above. These instruments take place within the core elements of the JPI strategic process (vision, strategic objectives, SRIA, implementation plan)⁶⁰ as well as in later phases of the process, in which dissemination and uptake of results through innovation-driven end-users is in focus.

⁵⁹ See also the following JPI Water strategic documents: Terms of Reference of the advisory boards (ToR), JPI Vision Document, SRIA, Communication & Dissemination Plan, Implementation Plan, Planning Document on Water JPI activities, instruments, management and procedures

⁶⁰ See also: Evaluation of Joint Programming to Address Grand Societal Challenges (2016), p. 17

These set of instruments (see table below) is therefore linked to the three main types of JPI Water activities as outlined in section 2.2.

During the process of carrying out the strategic core elements of the JPI, WATER JPI stakeholders are organised in (1) the JPI boards, (2) national mirror groups, or (3) involved via public consultations. In the mature phases of the JPI multipliers to end-users and technology providers as well as suppliers become more prominent as Stakeholders.

Stakeholders are involved by formats and instruments which are targeted to collaboration between partners and stakeholders working together, in variable geometry. They are enabled to discuss and share priorities, agree and recommend on necessary activities and participate on training and capacity building. Stakeholders also contribute to the implementation of the JPI as well as to the dissemination and uptake of project results by innovation-driven end-users.⁶¹

The main instruments and formats to involve stakeholder are listed in the following table. Some of the instruments/formats are basically linked to one type of activity others are geared towards more than one type:

Instrument/format of SHI	Main type of activity		
	1. Programs	2. Interfacing	3. Empower
<i>Activities: Established</i>			
Advisory board meetings (2 per year)	•		
Workshops on funding management (program owners and managers)	•		
Follow-up-, Call content-group (including AB members)	•		
Technical advisors (support of GB voting members)	•		
JPI Task Forces	•		•
National Mirror group meetings	•		•
Stakeholder workshops	•	•	•
Strategic knowledge exchange events	•	•	•
Exploratory workshops			•
Policy briefs and factsheets		•	•
Public consultations on SRIA (2014, 2015)	•	•	
Water JPI conference (19 th May 2016)	•	•	
Intranet / website (www.waterjpi.eu)	•	•	
E-newsletters, brochures, leaflets, press releases and press conferences		•	
Info-days on Water JPI activities (at national level)		•	
<i>Activities: New, planned, under design</i>			
The LinkedIn Water JPI researchers forum group (started on 19 th January 2016; managed by the Secretariat))		•	•
WaterWorks2015 Webinar (15 th March 2016)			•

61 See also: "Planning Document on Water JPI activities, instruments, management and procedures", p. 8

Instrument/format of SHI	Main type of activity	
Specific activities with key stakeholders (WssTp, EIP Water, Cost association)	•	•
Training for communication (web-minar with EIP Water)		•
Development of the Water Knowledge Hub (Capacity building)	•	•
Mobility schemes actions (Online platform on mobility schemes)		•
Infrastructure actions (Online platform on key water-related infrastructures)		•

Source: own compilation

Overall, the established instruments are more focusing on the types of activities which are linked to the initial phases of the JPI policy-cycle: (1) Orientation/Programming and (2) Implementation. The new and planned activities are (at least) geared towards the empowerment of RTDI actors respectively the phases of (3) Dissemination/Exploitation of project results and therefore the speeding up of the market-uptake and the generation of JPIs impact (see also above in this section).⁶²

Additionally, the Water JPI performs stakeholder activities along two institutionalized dimensions/levels:

- SHI *within the Governing structures* of the JPI, particularly with the two Advisory Boards and the National Mirror Groups which are involved on a regular basis, also beyond programming and SRIA development, advising the Governing Board mainly on the SRIA development and the implementation plan (topics for future calls, future consultations) and joint actions/calls implementation (as part of the call-content group and/or follow-up group after projects are funded)
- Targeted activities for and with stakeholders *beyond the governing structures* (at European, national and regional levels) on demand and for specific targets to be further developed (see section 2.2): e.g. through public consultations, brochures, knowledge exchange events, info-days, training, knowledge hubs and infrastructure/database related actions.

5.2.2 Stakeholder Involvement (SHI) within the Governing Structures

The Advisory Boards (AB)

Water JPI has two advisory boards with different roles. Both got renewed in March 2015. Some tasks are common, some are specific:

- the Scientific and Technological Board (STB): 10 prominent Scientists/senior experts from Academia

⁶² In fact, these different phases are not linear but are running in parallel in a "never ending loop"

- the Stakeholders Advisory Group (SAG): Representatives from 10 European level organisations: water Economic sector and economic sector, clusters, technology platforms and networks, service associations, water resources managers, water resources end-users

The STB members have recognised leadership in the specific relevant fields covered by the Water JPI. They come from public research and development institutions. They serve in their individual capacity, independent of national or institutional affiliation.

The members of the SAG are appointed by the Institution they are affiliated to and contribute to the board with the views of their respective institutions or networks.

Selection criteria

The Water JPI Governing Board has defined several criteria for selecting the Stakeholders Boards.

Methods that have supported the identification and selection of stakeholders/stakeholder organisations were (1) systematic mapping, (2) stakeholder analysis (of policy field), (3) impact analysis (affected groups, societal effects) as well as (4) multi-criteria decision methods.

GB members have the responsibility to identify key stakeholders in their country/region. Each JPI member country can nominate experts for the STB. Nominees were assessed by the Management Board (MB) according to their:

- experience in conducting research and development in the fields covered by this JPI,
- leadership in the thematic areas,
- academic record, and
- recent and active participation in international scientific expertise, foresight and cooperation.

Proposed by the MB, the GB approved the lists of both advisory boards in Brussels in March 2015. In March it was also decided to limit to 10 the number of members of each board.

Functions

Researchers/Scientists are in both boards part of the stakeholder communities. In the STB they are acting on their individual expertise. In the SAG they are represented by research alliances.

The stakeholder advisory group (SAG) seeks to ensure that the work of the Water JPI is:

- Relevant to water research needs
- Relevant to the needs of Water Economic sector enterprises, regulators and researchers
- Of high scientific quality

The main tasks of the SAG are:

- to serve as the key means for stakeholders to interact with the Water JPI;
- to provide input to the GB from the RTDI user perspective;
- to define urgent research, development and innovation needs in synergy with those mentioned by the European Commission, within each Work Program of the Framework Programme and by the Member States and the Associated Countries; and

- to advise on the implementation of the SRIA and on the impact of the Water JPI actions for the stakeholders.

The JPI is proposing to have synchronized meetings of the two advisory boards (one per year), with sessions in common and session in parallel. It has chosen to do so in order to better integrate the views of the two boards on common topics and to build up trust and acknowledgement between them.

The particular meeting arrangements depend on the topics to be discussed. Some topics are Board specific. Other topics are for both boards, and therefore it makes sense to bring the two boards together. Additional meetings are related to activities and proposed to individual board members (depending on the specific topic, on the stakeholder community to be engaged with).

Main activities of the advisory boards

The activity of the two boards built up between the Vision Document (2011) and the Thematic Analysis and the Framework for the SRIA (2014). Their activities during this time focused on the elaboration of the SRIA (in meetings and in thematic SH workshops) and on the Pilot call of the Water JPI. Most of their efforts were related to the SRIA, where they contributed with discussions and a series of descriptive fiches that led to the elaboration of the first draft. They were also involved in reviewing the drafts on SRIA v0.5 and v1.0.

The first meeting of the new advisory boards took place in June, 2015. It was mainly on first contributions to the second version of the Strategic Research and Innovation Agenda (SRIA 2.0) and the discussion of the Implementation Plan (2017-2019).

The contribution of the two AB goes also beyond programming and SRIA development. Its members advise the Governing Board on the implementation plan (topics for future calls, future consultations) and joint actions/calls implementation. At the level of Joint Actions, and in particular at Joint Calls level, the degree of involvement of the AB members varies and depends on the possible conflicts of interest which must be avoided. This has been discussed with the 2 boards in June 2015 and rules subsequently have been written down, approved by the GB and disseminated.

In case there is no conflict of interest, some AB members take part in the expert group for defining the call theme (call-content group) and/or follow-up group after projects are funded. The Follow-up Group is composed by some members of the Call Evaluation Committee and some Advisory board members, which carry out the review of the mid-term reports on the call and which draft the final evaluation reports.

Members of the advisory boards are also “ambassadors of Water JPI activities”, promoting Water JPI activities and the dissemination of outcomes on their national level (e.g. in the National Mirror Group), on international level (within their respective organizations) and help speeding up the alignment of programming in the Member States (MS), e.g. on specific SRIA topics.

The National Mirror Groups

The Water JPI is currently aiming at the development of the connection at national / regional levels via so called “mirror groups”.

The motivation of the Water JPI to support the establishment of national mirror groups or the use of an established group to discuss Water JPI related issues on a national level are:

- to have a platform for sharing positions (e.g. SRIA, implementation activities) on a national level
- to get the possibility to consult national and regional keys stakeholders that are not part of the AB (but often are also part of JPI strategic processes, like in SRIA workshops)
- to get support for future actions directly from MS
- to plan activities effectively towards the needs of the particular national stakeholders
- to become more efficient in strategic planning and giving feedback on a regular basis
- to increase commitment and the contribution of MS in JPI operational work and activities
- to speed up the market-uptake on the national level

Some Member countries have National Mirror Groups (support/discussion) with national and regional representatives of stakeholder's communities:

- Dedicated particularly to Water JPI activities: e.g. DE, FI, FR, SE
- Groups that (also) discuss Water JPI topics/issues (e.g. IE group on "Water policies", IT group on "H2020 Societal Challenges 2&5")
- Water JPI national mirror groups under discussion: DK

Group Members, also including national representatives of the JPI Advisory Boards, come from:

- Ministries and Agencies (Research, Economic sector, Environment, Agriculture, ...)
- Research Alliances and networks
- Enterprises / research centres, Innovation clusters
- representatives from other JPIs on national level

In general, the Water JPI members (voting member, technical advisor) are coordinating the National Mirror Group. Their size varies from one country to another and ranges from about 20 to 25 people respectively 10 to 15 attending in variable geometry depending on the topic.

The origin of the groups can be different but the actions they take are similar. The Aims of the National Mirror groups regarding the Water JPI are:

- Reporting back on Water JPI activities (the national delegate in the Water JPI to the other mirror group members)
- Broadening the basis of national stakeholders and feedback
- Coordinating the national contribution to Water JPI activities (examples: priorities for the SRIA and the implementation plan, countries beyond Europe to be targeted for international cooperation)
- Contributing to the development of strategic documents (e.g. Vision, SRIA)
- Preparing and coordinating national positions which will serve for negotiating Water JPI positions

Task Forces and Technical Advisors

As member country participation in JPI activities is based on the variable geometry concept (the members are not required to participate in all joint activities), the JPI is trying to have a continuous and high-profile level of commitment from all members. To do so, the JPI has created specific task forces on "long-term topics" of the JPI (e.g. alignment, international cooperation, Horizon 2020). These Task Forc-

es are composed by Water JPI members, on a voluntary basis, for coordinating and harmonising activities supported by the CSA and the ERA-NETs Cofund (the supporting projects of the JPI).

Members of these task forces are not only national delegates of the governing board, but also so called “technical advisors”, which are additional country representatives who can attend also governing board meetings to advise the National Delegate. Technical advisors do not have a vote in the governing board (1 vote per country).

5.2.3 Targeted SH activities beyond the governing structures

The JPI performs targeted activities for and with particular stakeholders groups also *beyond the governing structures*. These activities take place either (1) throughout the whole policy-cycle or (2) are designed and implemented on demand and for specific targets within the different phases of the Water JPI.

SHI Activities *throughout the whole policy-cycle* are mainly carried out with established instrument/formats like Policy briefs and factsheets, Intranet/Website, Newsletter, brochures, press releases/press conferences and Info-days on Water JPI activities.

In the phases of *Programming and Implementation* established SHI activities beyond the governing structures are e.g. stakeholder workshops, knowledge exchange events, exploratory workshops, public consultations on the SRIA or large JPI events like the Water JPI conference 2016.

New and planned instruments/formats of SHI (from 2016 onwards) are also geared to the Implementation of the JPI (e.g. LinkedIn group or WaterWorks2015 Webinar) and/or to the *Exploitation of research results* resp. the building of capacities and pre-conditions to do so. Such activities comprise instruments as knowledge hubs, training, infrastructure/database as well as mobility related actions (see in more detail in section 4). These activities are mainly carried out in cooperation with key stakeholders (e.g. WssTp, EIP Water, EurEau, Cost association) and/or with the help of the two advisory boards.

Stakeholder Involvement in the R&D projects of the calls

For some Water JPI calls stakeholder involvement in projects is highly recommended by JPI rules (exclusion criteria). This varies from a call to another as it depends on the call-topics (some topics may request more academics or more innovation driven). Most often Stakeholder involvement is advised to project applicants (evaluation criteria). However, stakeholder involvement in projects is always left to project decisions, but considered as an added value.

5.2.4 Support structures for Stakeholder Involvement

The Water JPI is the big umbrella / context under which Stakeholder activities are funded by different instruments.

For the Water JPI there has been a continuity of funding sources from the Framework Programme. These sources fund partly the Secretariat (in-kind contributions also necessary), which in turn funds the activities of the advisory boards (STB, SAG). The Water JPI secretariat provides clerical support to the advisory boards and finances their mobility.

Stakeholder involvement activities are also covered by the project supporting the specific activity to be performed. For instance, contribution to the SRIA was financed by CSA WatEUR in the first phase, and then by the ERA-NET Cofund WaterWorks2014.

General Water JPI communication is supported by the budget of each instrument (CSA, ERA-NET Cofund). For example, the Water JPI website and newsletters are currently financially supported by the CSA WatEUR. ERA-NET Cofund will support it when WatEUR finishes (end of June 2016).

Overall, the service, coordination and planning function (“glue function”) of the secretariat and of the coordination, but also of the other support structures, can be assessed as crucial for the effectiveness and efficiency of targeted SHI involvement activities in the JPI, not just within the governing structures but also beyond (see above).

5.3 Key results and aspired achievements

5.3.1 The Development and Update of the SRIA

Up to now, in the Programming phase of the JPI, most of the JPIs SH involvement activities took place and all the stakeholder groups addressed by the JPI were actively involved. The boards and mirror groups were (so far) mainly addressed by the JPI in order to contribute to the development of the SRIA. Public consultations were also used for both versions of the Water JPI SRIA.

The Water JPI SRIA 1.0 follows the structure of five research questions, further elaborated as five agenda themes: (1) sustainable ecosystems, (2) safe water systems for the citizens, (3) competitiveness in the water industry, (4) the bio-based economy and (5) closing the water cycle gap.⁶³⁶⁴

SRIA 1.0

The development of the Water JPI SRIA 1.0 has been a process which started with the publication of the Water JPI Vision Document in 2011. SRIA versions 0.5 and 1.0 were released in May 2013 and June 2014, respectively. The SRIA development was an iterative foresight process led by Water JPI partners (GB voting members, technical assistants, observers) gathering the views of multiple stakeholders and of the scientific community: Water JPI Advisory Boards, selected RTDI performers and society at large. The advisory boards also contributed with descriptive fiches that led to the elaboration of the first draft. They were also involved in reviewing the drafts on SRIA 0.5 and 1.0.

The production of the SRIA 1.0 relied on:⁶⁵

- The collection, review and synthesis of a large number of foresight documents;

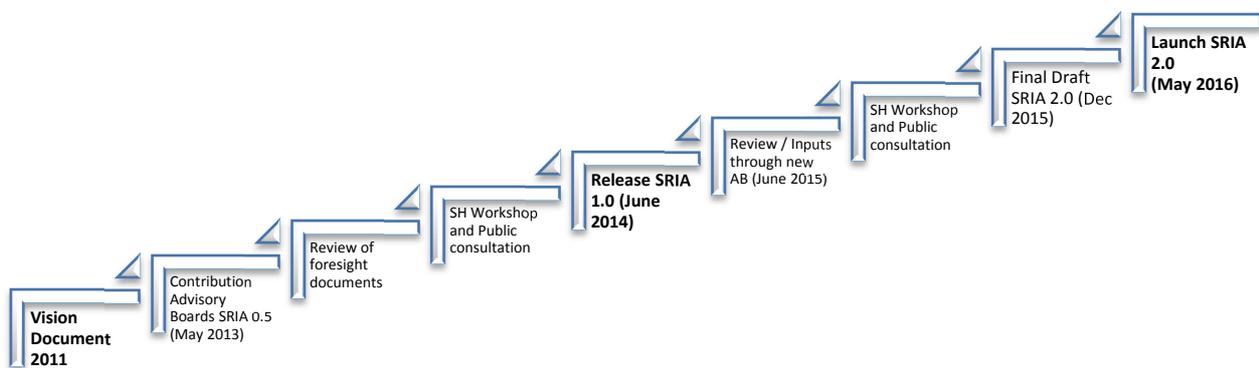
63 See also: “Planning Document on Water JPI activities, instruments, management and procedures”, p. 10

64 In SRIA 2.0 the titles have been slightly amended

65 See also: “Water JPI Implementation Plan 2014/2016”, p. 3 and 4

- A Consultative Workshop gathering 54 members of the European Water Research and Innovation community, aimed at fine-tuning and prioritising the research needs for the SRIA 1.0; and
- An online consultation, from which 390 responses from researchers, innovators, Programme owners and managers, citizens, Non-Governmental Organisations (NGOs), and other stakeholders fed into the SRIA.

Process of SRIA Development Water JPI



Source: Own compilation

SRIA 2.0

The update of the SRIA 1.0 was based on critical reviews and consultations (Stakeholder Workshop and Public consultation). In course of the first meeting of the new advisory boards in June 2015, the members contributed to the ongoing process of updating the Water JPI SRIA, and identified new water RTDI priorities for the second version. Subsequently, a 2nd consultative workshop about the SRIA took place in October 2015. About 40 people, members of the Advisory Boards, the Water JPI and national experts, participated in this workshop. Also a second public consultation was launched in 2015.

The SRIA version 2.0 was presented at the Paris Governing Board meeting in November 2015. Considering the comments of the GB, the version 2.0 was finalised end of December 2015. After edition and formal approval through the GB (the 14th of April, 2016) the document was officially launched at the Water JPI conference in Roma (May 2016). A user friendly version is also under finalisation.

5.3.2 Bridging the Gap towards Innovation

As JPIs want to generate impact on grand societal challenges there is a strong need to involve stakeholders and innovation-driven end-users. Only in collaboration with those how translate research results into new solutions and technologies and located more downstream the innovation cycle, the speeding up of market-uptake and the tackling of the JPIs objectives will be successful in the end.

Thus, the Water JPI has committed itself to interfacing with society and for a broad participatory approach to water challenges and needs. It aims at speeding up RTDI results uptake and therefore strengthening the links between Water science, policy and Economic sector.

To do so, it has established a number of different diffusion instruments and formats. Website⁶⁶, newsletter, info-days, exchange events and other formats for the diffusion of JPI related information/results belong to the “standard repertoire”, not just of Water JPI but all of the JPIs when stakeholders shall be kept up-to-date on current developments (see also table in section 3.1, “established activities”).

However, effective one-way or two-way communication with stakeholders is not sufficient, although necessary, when the objective of “transferring results into solutions” is meant to be a final goal of a JPI. Complementary, more interactive formats and activities, where stakeholders are becoming partners of the JPI, having shared responsibilities, competencies and common task are needed. Targeted stakeholders activities that go beyond the SHI levels of information, consultation or participation have to be designed together with the stakeholders in question, moving towards collaboration, co-creation and collaborative decision-making.

In case of Water JPI, which has entered a new phase in its policy-cycle, this goal of generating impact, is now in clear focus. To do so, new and planned activities for and with SH that empower RTDI actors on the one hand and prepare the pre-conditions of generating critical mass and effective linkages towards innovation-driven end-users on the other, are now on their way.

In the year 2015 the SRIA got updated (SRIA 2.0). In the year 2016 European (JPI) Water R&D results shall begin their “journey” towards the market, becoming solutions for “Sustainable Water Systems for a Sustainable Economy”.

According activities that are in the pipeline are described briefly in the two sub-sections below.

Joint Actions with Key Stakeholders

The JPI has started discussion and planning of the following activities with European key-stakeholders (WssTP, EIP Water, EurEau, Cost association) which are also represented in the SAG:

- Discussion on the content and possible synergies between the SRIA of the Water JPI and other Water Technology/Service Platforms, for a coordination on the Implementation of WssTP SRIA and Water JPI SRIA,
- Systematic and targeted exchange of needs and expectations,
- Dissemination of knowledge (content, process) between the Water platforms,
- Set up of an interoperable RTDI projects databases and definition of common templates; with EIP Water,

66 Webpage contacts: 185,000 from January 2015 to March 2016; Newsletter recipients: 5,100 (March 2016)

- Webinar-Training for effective/efficient communication with innovation-driven end-users (in cooperation with EIP water). Target audiences: Water JPI/H2020 Water Researchers, R&D Project-Managers (Pre-Test planned for 09/16; 30 persons)
- Participation of R&D project managers on regular WssTP/EIP Water events (e.g. annual meetings) and thematic workshops/sessions to present R&D results (organised in co-operation), and
- COST association: co-organisation of thematic workshops, mapping activities (using information from both sides; mutual learning) in order to find synergies, cooperation-partners for R&D projects and enlarge the researcher's base.

The Overall aims of these activities are:

- to generate interoperability
- to broaden the RTDI actors base
- to build up critical mass and synergies
- to speed up market-uptake, and therefore
- to bridge the gap towards innovation

The Knowledge Hubs

The Water JPI has started to develop knowledge hubs with the support of the two Advisory Boards and other stakeholders.

This Knowledge Hubs shall be located on the national level and are co-ordinated and financed by members states (funding agencies). The basic idea is to allow capacity building for JPI GB members, AB members, national multipliers and RTDI actors *in addition* to improved JPI communication and networking needs with innovation-driven stakeholders and the scientific community.

Knowledge Hubs can be understood as a (national) support structure that include several instruments in order to *create impact* of JPI R&D funding (focus on national level) and to overcome corresponding barriers: establishing a critical mass of research and technological excellence, integration and diffusion of knowledge, sharing infrastructures, networking/mobility actions, data and modelling tools, training and capacity building, provision of resources/know-how for thematic workshops (e.g. for SRIA themes) and process workshops (e.g. for developing a policy brief, write market-place document, water economy events).

To sum up, the Knowledge Hub shall focus on four particular fields of action:

- Critical mass
- Research Infrastructure and data
- Training
- Dissemination and market-uptake

5.3.3 Overcoming Challenges⁶⁷

The Water JPI has come a long way from its official kick-off in September 2010. One of the main success factors on this way is the targeted and efficient involvement of stakeholders along the Innovation-cycle and the different phases of JPIs development. At the same time, to design, plan and implement a SHI approach that suits the different targets and requirements of the JPI is far beyond simple. Moreover, several challenges to do so come up during time and have to be tackled with corresponding measures.

The most prominent challenges we could find on the “Stakeholder Journey” of the Water JPI are listed below:

- Sustainable Engagement of stakeholders (not drop-in and drop-out)
- Enhancement of intrinsic motivation and commitment of SH to become core-partners of the JPI (including SH from MS)
- Involvement of SH effectively (targeted; goals) and efficiently
- Mixture of useful activities at the right time (along the phases of the JPI)
- Mixture of useful activities with particular SH groups (level and purpose of involvement)
- Transfer research results to innovation (strong need to involve innovation driven stakeholders)
- Provision of resources on the side of SH and on the side of the JPI (time, competencies, funding)
- Coordination of time available for different stakeholder groups
- Management of conflict of interest
- Balance of Stakeholder representation

According to JPI representatives and evidence from Water JPI documents, the main recommendations (not exhaustive) to overcome these challenges are:

- Ensure continuity of the discussions / activities with the Advisory boards
- Develop and communicate the purpose of SHI and the corresponding roles/competencies of particular SH groups
- Consider the different geographical levels of stakeholder involvement (European, national, regional)
- Establish links also to the national level of the member states (e.g. through Mirror Groups)
- Plan SHI in advance (including rules of SHI), but stay flexible towards new and targeted SH activities
- Target SHI actions to their own interests (win-win situations; raises motivation and impact)
- Consider stakeholder’s limited time and resources available
- Consider the necessary resources and competencies for SHI on the side of the JPI (support structures and supporting projects) and their funding
- Consider the two institutionalized dimensions/levels of involvement (Stakeholders in boards and beyond)

⁶⁷ This section on “Overcoming challenges” is based on insights and interpretations derived from JPI Water documents and consultations with JPI representatives, only. Further information regarding challenges in SHI and according recommendations – e.g. from the GPC Evaluation document and the Protocol from the Stakeholder Engagement WS in Brussels (15th of January 2015) – are not considered here, though briefly in section 6 “Conclusions”.

- Propose a systematic process for identifying the key stakeholders and selecting the most relevant ones:
 - Vs. their willingness to contribute,
 - Vs. the (cost-) efficiency of their activities

5.4 Conclusions

A main success factor for the Water JPI, but also for other JPIs, is the involvement of stakeholders. The strong need to involve stakeholders and end-users is at the heart of each JPI when facing a grand societal challenge.

To do so in practice, a comprehensive and ambitious stakeholder approach was developed by the JPI. The Water JPI goes through a continuous cycle of becoming more mature and its SH activities are revised on the background of new developments and experiences gathered through implementation, dissemination and joint activities with different stakeholder groups.

Only in collaboration with those how translate research results into new solutions and technologies and located more downstream the innovation cycle, the speeding up of market-uptake and the tackling of the JPIs objectives will be successful in the end. Interactive formats and activities, where stakeholders are becoming partners of the JPI, having shared responsibilities, competencies and common task are needed. Targeted stakeholders activities that go also beyond the SHI levels of information, consultation or participation have to be designed together with the stakeholders in question, moving towards collaboration, co-creation and collaborative decision-making.

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7 Annexes

7.1 Annex 1 – JPI Urban Europe

Figure 6: Levels of stakeholder involvement

	Inform	Consult	Involve	Collaborate	Empower
Stakeholder engagement goals	To provide balanced, objective, accurate and consistent information to assist stakeholders to understand the problem, alternatives, opportunities and/or solutions.	To obtain feedback from stakeholders on analysis, alternatives and/or outcomes.	To work directly with stakeholders throughout the process to ensure that their concerns and needs are consistently understood and considered.	To partner with the stakeholder including the development of alternatives, making decisions and the identification of preferred solutions.	To place final decision-making in the hands of the stakeholder. Stakeholders are enabled/equipped to actively contribute to the achievement of outcomes.
Promise to stakeholders	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how stakeholder input influenced the outcome.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how stakeholder input influenced the outcome.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the outcomes to the maximum extent possible.	We will implement what you decide. We will support and complement your actions.
Methods of engagement	<ul style="list-style-type: none"> • Fact sheets • Open houses • Newsletters, bulletins, circulars • Websites, external and educate 	<ul style="list-style-type: none"> • Public comment • Focus groups • Surveys • Public meetings • Ultranet • Web 2.0 tools 	<ul style="list-style-type: none"> • Workshops • Deliberative polling • Web 2.0 tools • Forums 	<ul style="list-style-type: none"> • Web 2.0 tools • Reference groups • Facilitated consensus building forums for deliberation and decision-making • Experimental projects 	<ul style="list-style-type: none"> • Dialogue with Government • Local governance • Joint planning • Provision of data • Shared projects • Capacity building

Source: adapted from the International Association for Public Participation (IAP2) spectrum www.iap2.org (2007)

Figure 7: JPI UE Overview Capacity Building Plan

Target groups	Ambition	Potential instruments
Scientific and research community	Platform for experience exchange to build projects upon each other, to ensure uptake of latest insights and achievements in future projects; to bring together experts from various disciplines and sectors	Workshops, conferences, summer schools, exchange programs
Cities	Validation and promotion of new concepts and results, strengthen involvement in research and innovation projects, establishing strong city partnerships along project clusters	Workshops, local events, living labs,
Business & entrepreneurship	Supporting uptake of results into business solutions, enhancing involvement of companies and consideration of business needs in the projects	Workshops, invited talks
Science – practice cooperation	Ensuring a regular Challenging concepts and results and to develop innovative projects ideas	Sandpits or hackathons, JPI Urban Europe award, roadshows, annual conference, local events
Funding agencies	Project monitoring, reflection and improvement of instruments and framework conditions	Workshops, analysis, funding schemes

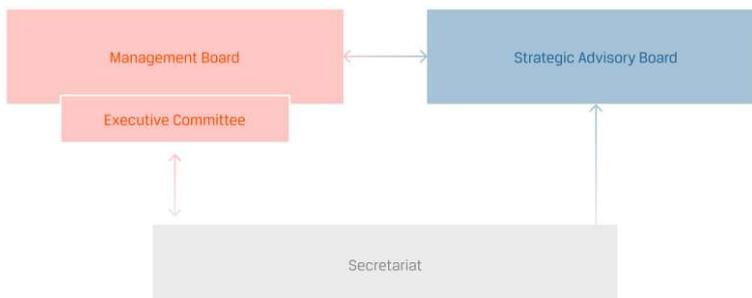
7.2 Annex 2 – JPI Oceans

Figure 3: Levels of stakeholder involvement

	Inform	Consult	Involve	Collaborate	Empower
Stakeholder engagement goals	To provide balanced, objective, accurate and consistent information to assist stakeholders to understand the problem, alternatives, opportunities and/or solutions.	To obtain feedback from stakeholders on analysis, alternatives and/or outcomes.	To work directly with stakeholders throughout the process to ensure that their concerns and needs are consistently understood and considered.	To partner with the stakeholder including the development of alternatives, making decisions and the identification of preferred solutions.	To place final decision-making in the hands of the stakeholder. Stakeholders are enabled/equipped to actively contribute to the achievement of outcomes.
Promise to stakeholders	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how stakeholder input influenced the outcome.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how stakeholder input influenced the outcome.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the outcomes to the maximum extent possible.	We will implement what you decide. We will support and complement your actions.
Methods of engagement	<ul style="list-style-type: none"> • Fact sheets • Open houses • Newsletters, bulletins, circulars • Websites, external and edugate 	<ul style="list-style-type: none"> • Public comment • Focus groups • Surveys • Public meetings • Ultranet • Web 2.0 tools 	<ul style="list-style-type: none"> • Workshops • Deliberative polling • Web 2.0 tools • Forums 	<ul style="list-style-type: none"> • Web 2.0 tools • Reference groups • Facilitated consensus building forums for deliberation and decision-making • Experimental projects 	<ul style="list-style-type: none"> • Dialogue with Government • Local governance • Joint planning • Provision of data • Shared projects • Capacity building

Source: adapted from the International Association for Public Participation (IAP2) spectrum www.iap2.org (2007)

Figure 4: Organisational structure



Source: JPI Oceans – Strategic Research and Innovation Agenda

Six phases of thematic foresight

According to the document “Final recommendation for a Foresight Process for JPI Oceans”:

- Phase 1: Instigation by the Management Board for a specific topic area
Management Board members may propose to launch a foresight exercise on any given topic, however, they will need the support of at least one other member country in order for the process to be launched. The proposing country is also responsible for the funding of the exercise.
- Phase 2: Scoping and background material
Identification of the individual expert participants for the exercise and outlines of the main themes and key challenges of the topic area will be prepared.
- Phase 3: Ideas Meeting: Development of normative visions of the future
The stakeholders identified by the Foresight Steering Committee will be invited to participate in a foresight workshop, having received the background material prior to the workshop. A wide range of stakeholders shall be invited to account for the broadness of the topic. The workshop will be moderated by an external expert.
- Phase 4: Drafting of the Visions Paper by foresight expert(s)
- Phase 5: Implementation Meeting: Exploring ways for implementing the developed visions
The second workshop translates the visions into concrete action proposals. Science and industry representatives as well as public authorities shall be strongly represented in this workshop, as they are the most likely to be the ones implementing any of the solutions identified.
- Phase 6: Presentation of a roadmap with concrete recommendations
On the basis of a meeting report prepared by the dedicated member of the Secretariat, the external expert(s) together with the national contact points will develop a roadmap for the topic area at hand. This roadmap is effectively a proposal for a “joint programme” for this topic area. Once this roadmap is finalised, it will be presented to the JPI Oceans Management Board, which can choose to adopt and implement any of the recommendations made in the roadmap.

