



**Fostering Improved Training Tools  
For Responsible Research and Innovation  
FIT4RRI**

**Experiment 1 Report**

*Building ISQ RRI Model*

(Deliverable 3.1)

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## Definitions

N/A.

## Executive summary

The RRI concept was unknown to ISQ when FIT4RRI project started, so the first challenge to ISQ’s project management and implementation team was to understand what lies beneath RRI and Open Science. This constituted what we called a “Learning step”. Being involved in WP1 and WP2 development strongly contributed to this and the sectorial workshop organised in Portugal (WP2) allowed a better perception of the whole issue, along with an initial workshop organised in Trondheim, by the time of the second project meeting.

By the time of the third project meeting (May 2018), we already had a plan for our experiment implementation, and we presented it to the whole partnership. It was quite an ambitious plan – we were aware of that – and we were not sure we could achieve all that we were setting out to do, but we preferred to aim at the stars and deal with whatever happened along the way.

Project activity*	2018												2019					
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M26
1. Learning step																		
2. Internal stakeholders identification																		
3. Preparation of a script for interviewing internal stakeholders																		
4. Interviewing internal stakeholders																		
5. Preparing internal workshop about RRI and OS																		
6. WORKSHOP 1 - INTERNAL STAKEHOLDERS						WS1												
7. Gathering list and preferential contacts of external stakeholders																		
8. Mapping ISQ R&D activity in terms of RRI pillars																		
9. Setting the goals of the experiment - for ISQ R&D activity																		
10. Training on RRI for internal (+ external) stakeholders								S1		S2		S3	S4	S5				
11. 1st National FOCUS GROUP										FG1								
12. Follow-up interview/questionnaire for the focus group																		
13. WORKSHOP 2 - MOEBIUS PARTNERS										WS2								
14. Follow-up on the diagnosis and strategy of MOEBIUS partners																		
15. 2nd National FOCUS GROUP - internal + external													FG2					
16. WORKSHOP 3 - MOEBIUS PARTNERS																WS3		
17. 2nd Mutual learning workshop																		
18. Evaluation																		
19. Reporting																		

Figure 1 – Original plan for experiment 1 implementation

A key moment for the whole experiment implementation was the two internal workshops (step 6 of the above plan) held with internal stakeholders. In those events, besides promoting a discussion on current R&D practices in ISQ, and presenting RRI to ISQ researchers, we used the compilation of actions and best practices available in the Benchmarking report. The idea was to present them to ISQ researchers and ask them to identify those which they thought would make sense for ISQ. This would be the starting point of ISQ’s RRI model design.

In September 2018 we initiated our internal training on RRI programme with a session on Open Science and Open Access. This was a face-to-face session, as would the rest of the training sessions be, even if this was not foreseen in the beginning. After analysing the training tools that were available in FOSTER platform, we realized that they were more targeted to universities and their staff, not companies, so we ended-up building our own training workshops, in a very tailor-made way.

In November 2018, a workshop was organised with the MOEEBIUS partners. The goal of this workshop was to present the RRI concept and pillars to the consortium, to promote a reflection on how the MOEEBIUS project was embedding RRI and to jointly think of ways to increase the project's alignment with RRI.

By the end of 2018, a series of constraints affected the course of the experiment, with the creation of an ISQ R&D Department. The main consequence, in terms of the experiment planning, was the postponing of the national focus group. An adjustment was done to the initial plan:

Project activity*	2018												2019							
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29
1. Learning step																				
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10. Training on RRI for internal (+ external) stakeholders								S1				S2	S2		S2	S5	S4	S3		
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18. Evaluation																				
19. Reporting																				

Figure 2 – Adjusted plan for experiment 1 implementation (February 2019)

Because of timing reasons – the MOEEBIUS project was ending – we had to quit the steps related to the MOEEBIUS project following steps initially planned.

A series of five workshops and meetings dedicated to Governance were implemented. The fact that we have several branches in Portugal pushed us to promote this number of workshops and meetings, to keep everyone involved and hear as much as possible the opinions of everyone involved. Besides, this was the initial stage of the newly created R&D department and we wanted to embed the RRI in the new mission and strategy that was being defined for the department.

In the final period of the experiment implementation, two Science Education workshops were provided to ISQ researchers (one in the northern part of the country and another one in the headquarters). A Public Engagement workshop was also developed and a registration process was initiated, but it coincided with an overload period and vacations period and we couldn't gather a minimum number of participants, so we decided to postpone it to after the Summer.

In June, we endeavoured in the organization of a national focus group but couldn't get a number of participants that could ensure a successful event, so we decided to go for a different approach: to ask for an interview or, at least, for these external stakeholders to reply to a survey. This provided us a poor feedback, compared to what we were expecting, as only three stakeholders "bothered" to contribute.

From this whole experiment, a series of achievements made us proud of:

1. An ISQ RRI model, considering the four pillars we focused on, is under design and will be embedded in the R&D Department mission and strategy; KPI to measure the success of implementation of this model will be set in the overall KPI set for the department annual assessment;
2. ISQ researchers were empowered on RRI during the experiment implementation and there is now an internal guideline to provide RRI training to every new researcher that is recruited to ISQ;
3. An internal repository was created and ISQ is joining an Open Access repository;
4. ISQ is now spreading the word of RRI in the STEM world: an RRI dimension was already included in an approved Sector Skills Alliance (Erasmus+ Programme) project in the Additive Manufacturing sector, as well as in another newly approved Sector Skills Alliance project on Industrial Symbiosis.

## **1. Experiment description**

### **1.1 Organizer**

ISQ is a private, non-profit and independent technological institution founded in 1965, currently running operations in more than 40 countries across the world (EU, Eastern Europe, Africa, Americas and Asia), offering its experience in technical inspections, technical assistance for engineering projects, consultancy services and training activities, supported by transversal research and development activities and by 16 accredited laboratories (e.g.: chemical, bio and agro testing, non-destructive testing, Aérospatiale, etc). ISQ has more than 1400 employees around the world – 800 in Portugal - being the biggest Portuguese technological infrastructure and the second biggest VET player in Portugal, with branches in all Portuguese regions.

ISQ conducts Research and Development activities (R&D), promoting projects with national and international partners, from both public and private sector, aiming at continuous product, process and service innovation. In collaboration with more than 1200 national and international partners, both industrial and academic, ISQ promotes technology transfer to the industry, thereby contributing for "in-country value" throughout the world. In the last 20 years, ISQ not only reached a position of leadership among Portuguese technological infrastructures, but also attained international recognition. It was partner or coordinator in more than 500 R&D projects (since the 80's) and participated in the Programs IXV (re-entry vehicle of the European Space Agency), ITER (International Thermonuclear Experimental Reactor), CERN (Large Hadron Collider) and projects ALMA - E:ELT for ESO (European Southern Observatory, projects in the field of lifelong learning, support to SMEs and human capital development. From 2006 onwards, ISQ has participated in more than 50 Lifelong learning programme projects.

ISQ is accredited for training services and is certified under Quality, Environmental and Safety management models according to ISO 9001, ISO 14001 and OHSAS 18001 standards, and is also an accredited body for training of trainers and teachers. ISQ is also accredited to certify people according to ISO 17024 and our laboratories are certified by ISO 17025.

Concerning the training activity of ISQ, it has a recognized experience in all areas of the training cycle (needs analyses, design, implementation, evaluation), including expertise in the creation of national standards (professional profiles), national quality references for VET, expertise in e-learning/b-learning, work-based learning and apprenticeship, technological training with ECVET, training for social inclusion, professional marketing and social marketing for employment (including disadvantage people and NEETS) certification and recognition of knowledge and competencies.

ISQ training department has built extensive know-how in innovative learning paths and key competences, as well as in developing tools and methodologies, working closely with the IEFPP, the Portuguese Public Institute for Employment and Training, and the National Agency for Qualifications. ISQ also delivers to the Ministry of Labour and Employment new Qualification Standards for new emergent jobs of updated skills in traditional jobs, focused on business market needs and business market intelligence. Corporate Social Responsibility (CSR) and Entrepreneurship are also key areas at ISQ training services, focus of many recent studies and projects.

ISQ is Board member of EVBB (European association of VET Centres) and is member of SOLIDAR (European Association for Social Justice in Europe) and belongs to the National Commission for Quality in Education and VET. ISQ belongs to ECVET national expert group and delivers ECVET workshops to different stakeholders in Portugal and in other European countries.

## 1.2 Aim & objectives

In FIT4RRI project, ISQ is responsible for one of the four experiments (Task 3.1) in WP3 (co-creation experiments). Moreover, ISQ is strongly involved in WP4 (training tools and actions) and in WP5 (governance settings).

The original objective of this experiment was to test some of the main outputs emerging from WP1 (on governance settings), WP2 (on sectoral variability with respect to RRI) and WP4 (on training tools and actions) on the Energy sector, in a co-experience model, anchoring FIT4RRI experiment to an ongoing project on the Energy area. The **MOEEBIUS - Modelling Optimization of Energy Efficiency in Buildings for Urban Sustainability** (<http://www.moeebius.eu/>) project was the selected project.

At the same time, and given the timing that ISQ was going through, we decided to embrace a wider objective of developing an ISQ RRI model and implement it in ISQ R&D units. This would, for sure, mean a much greater effort in the experiment but we believed it could bring a much greater impact to ISQ and surrounding stakeholders. In this sense, we can list a series of objectives underlying this major experiment:

- To empower ISQ researchers on RRI.
- To create a Roadmap with recommendations on how to include society (to include the quadruple helix) in ISQ's R&D activity.
- To develop an RRI model for ISQ and a strategic plan to implement it.
- To create, at least, an internal repository and define an Open Access policy for research results.

### 1.3 Selected RRI pillars

When asked to choose two main RRI pillars to focus on, we went for:

1. **Governance:** Opportunity for ISQ to change/improve the way R&D activity is done.
2. **Open access:** ISQ doesn't have any repository (internal or external). Using an open access repository for research results will have major impact for ISQ, as it will a) help us consolidate knowledge internally and b) help us disseminate their capacity externally. Part of the experiment is to define an open access policy, including defining an appropriate repository.

However, after the consultation of internal stakeholders, we decided to explore all the following RRI Pillars:

1. Open Science & Open Access
2. Governance
3. Public Engagement
4. Gender Equality
5. Science Education

By then, we didn't include the Ethics pillar in our experiment because, at ISQ, it is a well-known concept, having a training programme by itself offered to all staff. We have a "transparency policy" that includes an "ethics code" applicable to the entire organization, and "contractual conditions": <http://www.isq.pt/EN/about-us/transparency-policy/>

However, in the several workshops and internal meetings related to Governance and promoted during the experiment implementation, several researchers showed interest in seeing this pillar discussed and considered in our RRI model, so it was decided to also consider including this pillar in ISQ RRI model, even if beyond the FIT4RRI project duration.

By the end of August 2019, when WP3 experiments' implementation time was over, we had managed to cover the following RRI pillars:

1. Open Science & Open Access
2. Governance
3. Science Education

A Public Engagement workshop was already developed/prepared, tailored to ISQ researchers and meant to be implemented in the beginning of July 2019, but due to several constrains, we decided to postpone its implementation to after the Summer. During the workshop preparation, we realized the importance of this pillar to ISQ R&D newly created Department, so we are now aware of its importance to ISQ and are committed to including this pillar in our RRI model.

HR department reports annually indicators that include info on gender, but not specifically on R&D activity – we plan to change this, if possible.



## 2. Internal stakeholders' description

ISQ has about 45 researchers at its R&D Department. A mix of Junior and Senior researchers constitute the team of ISQ researchers. This allowed a rich share of views, visions and perspectives about what ISQ is doing with - and for - society. We consider that this balance between “dreamers” and more experienced researchers promoted a very fruitful discussion when exchanging ideas for the ISQ RRI model and strategy.

The areas of expertise of ISQ researchers is quite diverse, even if the vast majority has an engineering background.

FIT4RRI project implementation team was composed by:

1. **Raquel Almeida:** Senior Project Manager at ISQ's R&D Department, in the Training and Qualifications group; Researcher; Degree in Environmental Engineering. Works at ISQ since 2011. Project manager of FIT4RRI project on behalf of ISQ.
2. **Catarina Miranda:** Head of Unit of the Training and Qualifications group of ISQ's R&D Department. Degree in Physics Engineering. Works at ISQ since 1995.

Other internal stakeholders relevant to the experiment implementation:

3. **Célia Tavares:** Project Manager at ISQ's R&D Department, in the Training and Qualifications group; Researcher; Degree in History. Works at ISQ since 2017.
4. **Maria Margarida Segard:** Deputy Director at ISQ's Training department. Degree in Public and Environmental Law. Works at ISQ since 2000.
5. **Marina Almeida:** Innovation Project Manager at ISQ's Training Department. Degree in Economics. Works at ISQ since 2001.
6. **Joana Santos:** Project manager at ISQ's Training Department. Degree in Sociology. Works at ISQ since February 2019.
7. **Ricardo Rato:** Director of ISQ's R&D Department. Degree in Mechanical Engineering. Works at ISQ since 2008.
8. **João Paulo Duarte:** Contracts manager at ISQ's R&D Department. Degree in Physics Engineering. Works at ISQ since 1991.
9. **Ana Cabral:** Head of Unit of the Materials and Technologies group of ISQ's R&D Department. PhD in Materials Engineering. Works at ISQ since 1989.

In January 2019, a new R&D Department was created in ISQ - before that, there were several R&D Units working separately, associated to different departments. We started implementing the experiment before the merge of all units, so our work kind of acted as a joint reflection on how we could rethink our R&D activity in light of the RRI concept. The timing was perfect and that's why we decided to focus the experiment on creating an ISQ RRI model and strategy, hopefully imbedded in the new R&D department mission and day-to-day practice.

### 3. External stakeholders' description

The original objective of this experiment was to test some of the main project outputs, in a co-experience model, anchoring it to MOEEBIUS project, so external stakeholders from MOEEBIUS project are listed next, as we promoted an RRI workshop to launch the reflection and discussion in that project, in which ISQ is also a partner in the consortium:

- Tecnalia Research & Innovation (Spain)
- Honeywell, SPOL. S.R.O (Czech Republic)
- Hypertech Energy Labs (Greece)
- CORK Institute of Technology (Ireland)
- Solintel M&P SL (Spain)
- Tyndall National Institute (Ireland)
- Almende B.V. (Netherlands)
- TH Nürnberg (Germany)
- Belit – Belgrade Information Technologies (Serbia)
- KiWi Power LTD (United Kingdom)
- Grindrop ltd (United Kingdom)
- Beogradske elektrane (Serbia)
- Município de Mafra (Portugal)
- ASM- Market Research and Analysis Centre Ltd. (Poland)

In the goal of creating ISQ's RRI model, other national external stakeholders gave us feedback:

- Isabel Ferreira, from Instituto Politécnico de Bragança (IPB - Academia)
- Paulo Peças, from Instituto Superior Técnico (IST, Academia)
- Sónia Santos, from Companhia Industrial de Cerâmica, SA (CINCA – Industry)

### 4. Focus group outcome summary

We can say that there were two kinds of focus groups (if we can call it that way):

1. One with international external stakeholders - the MOEEBIUS partners. A workshop was organized and developed by ISQ, in Ericeira, Portugal, on the 21<sup>st</sup> of November 2018, taking the opportunity that a MOEEBIUS project meeting offered. 14 participants engaged on a joint reflection, RRI presentation and subsequent discussion.
2. Another one with national external stakeholders.

Regarding the workshop promoted with the MOEEBIUS consortium and focused on the project, the outcomes are reported in Appendix A.

In the following lines, we are presenting our findings from the national external stakeholders.

From the Academia side, participants reported a somehow different approach to RRI (even if not named as so). Open Access is already a reality and one of them even mentioned the fact that they are a signatory of the "Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities". However, it was mentioned that some publications are available only if paid for, because of credibility and copyright issues.

From the industry side, they were not familiar with the Open Access concept.

About the engagement of the public in their R&D activity, participants from academia expressed different views and approaches:

- One reported they involve society even in the definition of research lines: “we organise co-creation sessions involving students, teachers, researchers, entrepreneurs and others local agents, in particular to define future strategies and priority areas for research and innovation.
- Another one showed the perception that when we talk about public engagement, we are only talking about general public, and that this public doesn’t understand scientific language. “In engineering, it makes no sense and is not so useful to contact the average citizen. The average citizen is not our customer, not the customer of our innovations. Here, we are working for someone to serve society, and that someone is industry/businesses. The only ones worth presenting innovations are companies, and we present to them. The interest we have in presenting our innovations in newspapers, on the news, on the internet, is for students to come to our school and think that it is the best school in the world.”

Industry reported no public engagement in their R&D activity. However, in their view, there is a way for including society: “Through working links with research promoting institutions such as local universities and research institutes and centres with projects in our organisation’s work area - projects in co-promotion.”

Regarding science education, both academia stakeholders consider that that’s their core activity – to teach science – and one of them mentioned demonstration events that usually take place at the end of some projects. In these events, innovations are showcased. However, these events are usually sector specific, so perhaps not really “fit” into the Science Education pillar of RRI. They also mentioned that they hold several patents and they license them, but they end-up not organising events about it.

The industry stakeholder believes they promote Science Education: “Yes, we welcome in-work students’ internships in professional areas related to our professional aspect. They are usually integrated into work projects prepared in conjunction with their educational institution. It can also be research projects, depending on the training field and the kind of work in which they are inserted.”

## **5. Follow-up interview summary**

All participants said they wouldn’t oppose to an open access policy for results of R&D joint projects. They did, however, express some reservations when we are talking about project results coming from industry innovation R&D projects, as these are, sometimes, crucial for their competitiveness and they don’t want to have these innovations publicly available. The

same applies to data retrieved from their operation – most of the times they are not available to share it publicly.

Surprisingly, the participant from Industry said they wouldn't oppose to the publication of data related to joint R&D projects but, given the fact that they said before they weren't familiar with the open access concept, we are not fully confident they were totally aware of what they meant.

When asked about ideas for ISQ to get an increased involvement of society in the definition of guidelines for research, implementation and monitoring, one stakeholder from academia suggested: "Improving communication between institutions and organizing sessions for local actors to share experiences, challenges and ideas for solutions."

The industry stakeholder expressed its organisation's availability to co-organize or participate, at the invitation of ISQ, in events that allow the exchange of views on the research ISQ is developing together with them.

Regarding the most useful methodologies to promote Science Education (e.g. workshops, colloquia, conferences, open days, etc.), the feedback was: "They all have their importance and it is interesting to diversify, to reach as many people as possible. Must be short, dynamic events."

All these participants already have a tradition of working together with ISQ in R&D projects, so we asked them what they would see as necessary to promote RRI in joint R&D new ventures/projects. The feedback received was diverse:

- "It would be necessary to create a link with ISQ that would promote this specific area of RRI in ongoing projects."
- "To set up a committee of experts - three or four - and make a work plan to influence organizations to include public funding for this matter."

When asked about the benefits they could foresee in incorporating RRI in new R&D projects, contributes were quite detailed:

1. The visibility of our research is very restricted to countries that have the financial means to pay for the access to this research. It means that there are fantastic researchers in India, China, Pakistan, out there. As they are less able to access scientific work, they find it difficult to access our research. Therefore, if science continues to be validated by journals with good impact, but it becomes available to everyone, it can be a huge benefit to science."
2. Democratization of science: knowledge sharing among the scientific community, society, business.
3. Increased recognition and social and economic impact of science. Society trusts scientists, but we must repay it.
4. Opening of the scientific process as a whole, reinforcing the concept of scientific social responsibility and all aspects of public funding.
5. Generation of multiple opportunities for innovation (related to products, processes and services) and valorisation of intellectual property; it offers scientific brainstorming; More information = more opportunities.
6. Increased research efficiency by avoiding replication of studies and waste of resources (material and human): for negative results, avoids the replication of unnecessary

- experiments; for positive results, it allows research to begin at more advanced points and to contribute to the advancement of the state of the art and to be disruptive in nature.
7. Increased knowledge of the process of scientific work (data source, methodologies, etc.); transparency of the peer review process.
  8. Promotion of the academic rigor and increases the quality of research. It would be globally scrutinized. The more critical glances (especially from peers) we have on the information released, the better. Exposure of weaknesses in methodologies / results would certainly strengthen the final and global impact of the investigation;
  9. Acceleration of the creation of new research topics, bringing emerging scientists to the fore.
  10. Promotion of scientific return to institutions, in particular through the ability to attract talent and mobility of researchers.

In terms of barriers that these external stakeholders can see in incorporating an RRI dimension in new joint research projects, academia stakeholders stated:

“- Recover intellectual property rights that are currently controlled by publishers.

- Peer review is becoming increasingly difficult; more transparency.

- Free-access open-access newspapers are of poor quality; best newspapers have to pay to publish in open access and authors of good works need not do so.

- Open science indicators need to be included in evaluation processes: units, researchers, etc.

- Do not precipitate steps in scientific disclosure (e.g., theses, publications, patents).”

“[I already mentioned the funding issue, to pay these reputed publishers. States realize who they are funding. Why should it be a paid thing if it's just uploading the article and getting it there?] The resistance of the publishers of scientific journals, because they may no longer have a monopoly.”

The industry stakeholder stated that “It is always very difficult to combine research and development with the routine of industrial work, which is, in itself, very absorbing in terms of time and space to think "out of the box". In this area, and by my own experience, it will always be necessary the creation of projects with full time people working to succeed, always linked to institutions that work exclusively in this area.”

Regarding internal policies that would promote the embedment of the four pillars ISQ is considering (at this point) – Open Science and Open Access, Science Education, Governance and Public engagement – in new joint projects:

- From the academia side, one stakeholder stated that although nothing prevents this from happening, there would have to be specific funding for that: “From the strategic point of view, our school is aligned with this. There are no regulations or rules that prevent this. There is, however, a natural inertia because it is not valued. And as it is not valued, I do not bother to disseminate what I do, except in such magazines [reputed scientific publications] that count for my CV.”
- From the industrial stakeholder, there is openness to this approach: “The company's internal policy is always collaborative with all institutions with which we have ongoing

projects, so ISQ would be no exception, everything will depend on the specific project to be developed.”

## **6. Workshop summary**

Please see info above.

## **7. Lessons learnt**

### **7.1 Main blockers of quadruple helix co-creation**

This experiment was mainly internally focused, so the main actors were ISQ researchers. In this sense, external stakeholders were not a priority in the creation of an ISQ RRI model, and the focus group followed by the follow-up interview that we were to organize were merged into a single exchange in the format of an interview or survey. We decided to go for this option as the number of people that were available to participate in the focus group was not considered to be significant and, in our opinion, would not be enough to promote a successful event. However, the solution we found turned out to be insufficient as well, as it didn't provide the level of ideas we were hoping for. Apart from that, it is clear, from the feedback received, that external stakeholders (the type that we managed to get contributes from – Academia and Industry) already consider that ISQ's R&D activity is done in light of RRI practices; i.e., ISQ works with and for society, as it is the core of its mission.

It was noticeable that this experiment, with its series of workshops and joint reflection sessions followed by training sessions on the selected pillars, constituted an important awareness raising action: researchers were faced with several issues and ideas that are not usually “on the table” in their professional life and work routines. Naturally, we felt that we “planted a seed” and that, in some cases, it is not obvious nor immediate the change of mindset that we are fostering, especially in an engineering house such as ISQ.

ISQ is a private company, so for an RRI model to be in place, there must be a true added value in embedding RRI – there has to be a proven advantage in bringing RRI to our R&D activity. Historically, we already work with and for Industry (mainly) and Academia is a core partner; policy makers see ISQ as a trustful supporter of technological innovation and uses ISQ's consultancy and services, besides being also brought into R&D projects' consortia when we feel it makes sense and they are interested/available to participate. The only part of the quadruple helix that can be more involved in ISQ's R&D activity is the Civil Society, with which there is no direct link but who we want to involve more in the future, creating new bridges.

## **7.2 Proposed consensus strategies & co-creation approaches/frameworks**

- A co-creation approach was used since the beginning of the experiment, collaboratively reflecting on, and discussing, the definition of ISQ RRI model. By merging different areas of expertise and experience, a new and innovative model is being created – one that would not be possible if each actor was to tackle the challenge individually.
- In January 2019, a new R&D Department was created in ISQ (before that, there were several R&D Units working separately, associated to different operational departments). We started implementing the experiment before the merge of all units, so our work kind of acted a joint reflection on how we could rethink our R&D activity in light of the RRI concept. The timing was perfect and that's why we decided to focus the experiment in creating an ISQ RRI model and strategy, hopefully imbedded in the new R&D department.
- Given the timing of the experiment, the newly designed mission and vision of the new department already takes into account the RRI and OS concepts and values.

## **7.3 Most relevant RRI practices (from WP1 and WP2) for the experiment**

- Internal RRI Awareness Program and RRI Training Program
- Participation in RRI-oriented national / international programs
- RRI-oriented certification processes (long term plan)
- Participation of the organization in specialized RRI networks

## **7.4 Institutional changes required to fully embed the chosen RRI pillars**

N.a.

## **7.5 Policy support/changes required to properly embed RRI in the ongoing research with the involvement of the quadruple helix**

Mandatory RRI training for all new researchers entering ISQ;

Establishment of key performance indicators to measure the success of ISQ RRI model implementation;

Project screening check-list including RRI items.

## 7.6 Any issues/constraints noticed during the experiment implementation (i.e. procedural issues)

- HR department was resistant to participating in the process and delayed a step that they would be most fit to perform: the task of Mapping ISQ R&D activity in terms of RRI pillars;
- Before the first internal workshop, the heads of the R&D units didn't compromise much to the experiment and most of the participants of the first edition of the internal workshop was composed by junior researchers. However, after experiencing this workshop, some key and senior researchers asked for a second edition where senior researchers would be pushed to attend and so we got everyone's attention and the result of both editions was more meaningful to everyone.
- The previous point, along with a Summer period, pushed forward the organization of the first training session, which then pushed forward the rest of the training sessions calendar.
- There was a serious reluctance in sharing contact details to compose a list of external stakeholders to invite to this experiment. Several emails were exchanged pursuing the achievement of this step.
- In our experiment plan we had foreseen some eLearning sessions that would be based on the tools available on Foster Portal. However, we realized that there were not enough resources in the portal that would correspond to our training needs. In this sense, we had to design tailor-made courses, to be presented face-to-face.
- There is a certain discredit from people working for long at the company - due to some initiatives in the past that led to no major change.
- The MOEEBIUS partners were also targeted by this experiment but the restructuring phase that the ISQ researchers went through during the new department setting clogged the work normal development and the next steps in this process were, meanwhile, left behind. Meanwhile, the MOEEBIUS project ended in April 2019.
- Several changes in the project team constituted a barrier. Newcomers always took a considerable amount of time before they could feel comfortable with the RRI and OS thematic and contribute to the project development.
- Given that RRI and OS are not considered a priority in the day-to-day activity of the company, people tended to postpone actions related to the experiment implementation whenever calendars were conflicting.
- It is difficult to get people to come to an event dedicated to a thematic that is not in their organisations' agenda and so we didn't manage to gather a sufficient number of participants to guarantee a successful focus group with external stakeholders. As a plan B, we summoned them to give a contribute through an interview or a survey – we offered both options. Only stakeholders from Academia and Industry gave feedback.



## 8. Next steps

Due to the growing interest on the subject and need for the successful implementation of an ISQ RRI model, we will continue the implementation of training actions on the RRI pillars that weren't approach during WP3 development, kind of extending it. Pillars that are still missing training sessions and that the implementation team sees as important to promote are, first of all, the Public Engagement RRI pillar training action, as it is one of the pillars that are considered in the model that is being designed. It was foreseen the implementation of this workshop in July 2019, but it ended up not being possible to do it due to an insufficient number of researchers available to participate by that time (holidays, upcoming deadlines for important funding calls, heavy workload), but the whole workshop was prepared and it will be implemented as soon as possible – hopefully during September/October 2019. It is also foreseen the implementation of workshops dedicated to Gender Equality and Ethics pillars, either making use of the training tools available in FOSTER platform or developing our own training tools, but these pillars are out of the scope of the ISQ RRI model that we are developing.

Our RRI model will also be finalised, and an implementation strategy is to be proposed to ISQ board. Meanwhile, a set of KPI related to the implementation of the RRI model will be set and included in the set of indicators defined to measure the new R&D department's performance.

A project screening procedure will be built for project ideas and a check-list related to our RRI model will be included.

There will be a specific area in ISQ's institutional website dedicated to our R&D department and gender balance in ISQ researchers will be reported there.

## Appendix A - Workshop

### CONTEXT

A workshop was organized and developed by ISQ, in Ericeira, Portugal, on the 21<sup>st</sup> of November 2018, taking the opportunity that a MOEEBIUS project meeting offered. 14 participants engaged on an RRI presentation, followed by discussion. Participants were asked to answer some questions regarding the goals and challenges of the research, strategies to stimulate the use of research and tools for improving research and its use. In this report we present the results of the questionnaire.

### GOALS AND CHALLENGES OF THE RESEARCH

What do you see as the promise of your research?

“Improve energy efficiency, reduce peak load, increase sustainability, keep upgrade comfort levels, reduce carbon footprint on European building stock. Introduce new business models, promote praise awareness and demand response.”

“We’d want to reduce the gap between predicted and real energy performance. The development of more accurate and dynamic simulation models. This activity leads to risk reduction in ESCO and aggregators business models. We are going to facilitate the investment in energy efficiency and indoor comfort conditions projects.”

What do you see as potentially not desirable? What are the challenges and concerns?

“Not to reach previous objectives. To align different partners’ business objectives. Create and maintain engagement after the project. Over ambitious of the project and difficulties on deployment on the pilots.”

“The challenge is seeking up the reliable and accurate maintainly of energy consumption and comfort in buildings and houses. Our concern is also related with users’ acceptance of the new control strategy and the possible lack of cooperation of users. We concern also of interoperation between MOEEBIUS framework components is also our challenge.”

How are challenges and concerns addressed?

“By means of a QMP, regular engagement of partners, weekly follow up progress meetings.”

“Communication between the partners, different technical tasks, implementation of the pilots.”

How is your research/project connected to other actors/society?

“Through Living Lab co-creation framework including all relevant stakeholders covering the whole market value chain. Dissemination activities (conferences, ...) and a broad use of social media.”

“We are connected with ESCO’s, building users, inhabitants, dealing managers, municipalities, research community, LL members and open public we reach. Usual dissemination and communication tools”.

#### STRATEGIES TO STIMULATE USE OF THE RESEARCH

What kind of external people are involved in your research?

“Occupants and end-users of project pilot sites’ buildings. Project Living Lab community (diverse groups of industry, academia and public authorities’ members.”

“suppliers, subcontractors end users, building occupants, local activities, PTNS, individuals’ competitors, human resources.”

How do you work to make way into the market?

“Developing specific project exploitation plan. Free trials with potential clients (pilot sites, virtual demos). Establishing new commercial ventures between project partners.”

“Long term validation, development of new business models, licensing technology transfer, market radar activities. Developing exploitation plan (individual and collective).

Can you come up with any examples of mismatch where research/innovation has not been taken up by society or societal demands are not researched on? WHO needs to do WHAT to improve that situation?

“The very macro on high level society goals do not engage people to carry out individual action”

“Vaccines, clean energy, electrical vehicles, societal models for redistribution of wellness. Nuclear research small groups, no lobby supported; Artificial intelligence; citizens critically evaluate government society change on educational patterns.”

When do you present the results of your work, in what forums, and how do you present the results?

“Industry groups, regulatory bodies, H2020 networking events; scientist/academia conferences, society (social media)”

“Nationally: Government departments, national funding, start-up communities, academic research community, Living Labs meetings. Internationally: Workshop, social media, academic conferences, networking events (H2020, FP9).”

How do you work with questions on future use and application?

“Identifying project results. We try to map the full scenarios, from the technical details of the components to their common utility in the real world.”

“Stakeholders meetings ate the beginning of the project. Part of the co-creation of the solutions. Realign MOEEBIUS with industrial providers towards rethinking environmental managing.”

## TOOLS FOR IMPROVING RESEARCH AND ITS USE

Had you heard of RRI?

“Only a few during calls preparations while doing some research”.

How would you relate to RRI?

“We relate because we follow some of the pillars/principles (not directly) during the MOEBIUS development and in other projects. We read some articles about research in newspapers, regular citizens do not know get into deep on the researches outputs, usually only researchers involved in the project.”

How do you think you could use RRI to change something (and what would you want to change)?

“To follow the pillars while preparing proposals. To have a checklist for people going through it while writing proposals in order to follow them during the development of the project. Ex. It would be nice to have more women on H2020 projects as usually there are more men on them.”

## Appendix B – Experiment KPIs

The following relevant KPIs have been monitored:

CODE & INDICATOR	Tool / Result
<b>RELEVANCE - Scope of the experimentation</b>	
R1 RRI pillars focused upon*	<ul style="list-style-type: none"> <li>– <b>Governance</b></li> <li>– <b>Open access and Open Science</b></li> <li>– Science education</li> <li>– Public Engagement</li> </ul>
R2 RRI best practices considered for assessment of their potential implementation in the ongoing research*	– 20 (All presented in the Benchmarking report)

<b>RELEVANCE - Agreement</b>	
R4 Degree of agreement of the beneficiaries about the aims of the experiment	4/5
R5 Degree of agreement of other concerned actors in the organisation about the aims of the experiment	4/5

CODE & INDICATOR	Tool / Result
<b>RELEVANCE - Mobilisation of external actors</b>	
R7 Active involvement of the organisation's management *	The director of the R&D Department is personally involved, as well as the heads of units. The administration is aware and following the implementation of the experiment.
R8 Active involvement of researchers *	All ISQ researchers (46+internships) have been involved in at least one of the workshops promoted by the experiment.

<b>EFFECTIVENESS - Implementation process</b>	
E1 Actual implementation of the planned actions	15/19 steps of the original plan have been implemented
E2 Compliance with planned schedules and deadlines	Medium

CODE & INDICATOR	Tool / Result
<b>IMPACT - Unexpected effects &amp; Multiplicative effects</b>	
<b>I5 Occurrence of unexpected effects concerning the involved actors (e.g. unplanned introduction of new norms, policies, or procedures; establishment of new networks or groups as an effect of the experiment; etc.)</b>	– Creation of a new R&Di Department
<b>I6 Observation of result/best practice multiplication in the quadruple helix ecosystem generated through the experiment *</b>	– RRI dimension included in new projects and project design

CODE & INDICATOR	Tool / Result
<b>IMPACT - Communication impacts</b>	
<b>I7 Increased visibility of the experiment within the organisation</b>	– Medium
<b>I8 Increased visibility of the experiment outside the organisation</b>	– Medium-High

<b>IMPACT - Degree of agreement with the experimentation</b>	
<b>I10 Degree of satisfaction of the Teams about the activities carried out</b>	– High
<b>I11 Degree of satisfaction of the actors internal to the organisation about the activities carried out</b>	– 5/5
<b>I13 Number of RRI best practices evaluated and highly rated by the stakeholders *</b>	7: – RRI-oriented platform and networking – RRI-oriented code of conduct – “Top-down” approach – RRI-oriented comprehensive training – Business-oriented approach to RRI – STEM and social sciences institutional partnerships – Local networks

MODELS OF GOVERNANCE SETTINGS	EXAMPLES OF ACTIONS	BENCHMARKS
Internally-initiated social model	Internal awareness-raising and RRI training programme	
Internally-initiated normative model	<ul style="list-style-type: none"> <li>- Adoption of new internal regulations, procedures, guidelines developed by the organisations' leadership;</li> <li>- Establishment of internal RRI-oriented research funding criteria</li> </ul>	Top-down approach
Externally-initiated normative model		RRI-oriented platform and networking
Externally-initiated knowledge-oriented model		Business-oriented approach to RRI
Network-initiated social model	Participation of the organisation in RRI-specialised networks	RRI-oriented comprehensive training
Network-initiated normative model		Local networks
Network-initiated knowledge-oriented model		<ul style="list-style-type: none"> <li>- RRI-oriented code of conduct</li> <li>- STEM and social sciences institutional partnerships</li> </ul>

CODE & INDICATOR	Tool / Result
<b>RELEVANCE- Scope of the experimentation</b>	
R3 Connection with existing policies/measures developed by the organisation	n.a.
<b>RELEVANCE - Agreement</b>	
R6 Degree of agreement of quadruple helix actors about the aims of the experiment	4/5

<b>IMPACT - Institutional agreement</b>	
I1 Number of quadruple helix consensus solutions (common agreed plans/steps) for supporting the embedment of RRI *	n.a.

<b>IMPACT - Expected changes</b>	
I2 Actual introduction of organisational, regulatory or procedural changes at the level of the research group/department/quadruple helix actors directly involved with the experiment	New training programme on RRI for any new researcher recruited to ISQ's R&D Department.
I3 Actual introduction of organisational, regulatory or procedural changes in parts of the organisation not directly involved with the experiment	Gender balance annual reporting specifically regarding ISQ's R&D Department.

CODE & INDICATOR	Tool / Result
<b>IMPACT - Degree of agreement with the experimentation</b>	
I9 Degree of satisfaction of the beneficiaries about the activities carried out	5/5
I12 Degree of satisfaction of the quadruple helix actors about the activities carried out	n.a.

<b>IMPACT - Changes in the perception of RRI/OS</b>	
I14 Changes in the interest in RRI/OS of each internal actors (at the beginning & end of the experiment) *	3/5 Positive change in most of the cases – very much in line with the Taylor-made approach used in the experiment.
I16 Changes in the awareness of RRI/OS of each internal actors (at the beginning & end of the experiment) *	4/5
I18 Changes in the perceived usefulness of RRI/OS of each internal actors (at the beginning & end of the experiment) *	4/5



CODE & INDICATOR	Tool / Result
<b>EFFECTIVENESS - Beneficiaries</b>	
<b>E3 Match between the number of beneficiaries planned/ number of actual beneficiaries</b>	Don't know exactly how to report; all ISQ researchers are beneficiaries of the experiment, which doesn't mean that they all participated in all activities carried out during the experiment...
<b>E4 Match between the type of intended beneficiaries and the type of the actual beneficiaries</b>	We missed a greater involvement of external stakeholders, who were a little left behind in the course of the experiment.

<b>IMPACT - Orientation towards future involvement</b>	
<b>I20 Explicit orientation to promote/ get involved in future RRI/OS-oriented activities of each internal actors</b>	High (4/5)