Abstract

This report describes the findings from the case study of RRI in practice in research and innovation in Norway.
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1. Executive summary

This report provides a description of conceptualizations and organizational conditions and practices pertaining to responsible research and innovation (RRI), and what the European Commission (EC) associates as the keys of RRI (ethics, gender, open access, public engagement and science education), in Norway. This includes a mapping of the current status of both the overall concept as well as aspects and dimensions of RRI in terms of both drivers, barriers, good practices and potential points of development.

The report describes the national context and policy discourses in Norway pertaining to RRI and the keys as well as two organisational case studies; Oslo Metropolitan University (OsloMet, formerly Oslo and Akershus University College) and The Research Council of Norway (RCN). The focus in the project has been on understanding and supporting implementation of RRI related policies and practices, and have included identifying barriers, drivers and best practices. The report will be used in subsequent studies comparing RRI implementation in 22 research conducting and research funding organisations across 12 European and non-European countries involved in the project.

Norway is advanced in some key areas (research ethics, open access and gender equality). In these areas the EC keys appear narrowly defined and unambitious. In Norway, ethics goes far beyond research integrity and a minimal research ethics, and includes broader reflection on the relation between science and society. Moreover, in Norway, the challenge now is to implement diversity policies, not isolated gender policies. Finally, in Norway, the Open access agenda is superseded by the broader Open science agenda.

There is less focus on societal engagement and science education in Norwegian policy and research organisations. It is worth discussing whether this should be lifted higher on the agenda, at the national policy level and in research organisations. RRI as an integrated approach highlighting the importance of anticipation, inclusion, reflexivity and societal responsiveness in research is established in some areas of the RCN, but the visibility of such an approach can be increased if explicitly taken up in government white papers.

We outline a number of good practices that may be inspirational for other organisations or other countries. In addition, we end up with the following recommendations for national and European policy makers, as well as decision makers in research conducting and research funding organisations:

- Include RRI in national research and innovation policy
- Consider RRI friendly research assessment models and incentives
- The RRI concept should not be too explicitly defined in terms of keys
- Time must be given for RRI implementation processes to mature
- Find the right time to implement the RRI agenda.
- The importance of champions.
- Build alliances around strategic goals.
- Be open and transparent about differences and conflicting understandings of the relation between science and society. RRI is not a political program that everybody has to agree upon.
- Develop RRI as a learning process.
- Develop arenas where staff – and in the case of funding organisations, applicants – can train on reflection, anticipation and responsibility pertaining to the relation between science and society.
2. Introduction: about the report

This report provides a description of conceptualizations and organizational conditions and practices pertaining to responsible research and innovation (RRI1), and what the European Commission understands as the keys of RRI (ethics, gender, open access, public engagement and science education), in Norway.

The report provides an overview of policies and practices of RRI at the national level. However, the main emphasis is on two organisational case studies; Oslo Metropolitan University (OsloMet, formerly Oslo and Akershus University College) and The Research Council of Norway (RCN), on the following aspects of RRI:

- The organisations’ own understanding and operationalisation of its approaches and strategies pertaining to socially responsible research practices.
- The 5 European Commission RRI keys: ethics, societal engagement, gender equality, open access/science and science education.
- Process dimensions that are often regarded as central to RRI: diversity & inclusiveness, anticipation & reflexivity, openness & transparency, and responsiveness & adaptation.

This includes a mapping of the current status of both the overall concept as well as aspects and dimensions of RRI in terms of both drivers, barriers, good practices and potential points of development. The reviews are based on a range of publically available policy documents, interviews with informants at a national level, a national workshop on RRI, and interviews and focus group interviews with employees in the two selected organizations.

It is important to stress that the report and its content is not an evaluation, but rather an analytic report and reflection that can be used to further facilitate the development of RRI as concept and framework. The report introduces suggestions for reflections and development of different aspects of RRI and proposes future objectives and targets pertaining to RRI. The report concludes with recommendations to research performing and research funding organisations, national and European policy makers, as well as suggestions for good practices that may have wider applicability.

The report is largely structured according to the protocol for the organizational reviews and outlook developed within the RRI-practice project. The report will be used for subsequent cross-cutting comparative studies in the RRI-Practice project, but is also intended to be a stand-alone contribution of interest to any reader interested in Norwegian research policy. In addition to this public report, more detailed reports have been developed and delivered to each included organisation with the intention to assist in their further RRI work.

The authors thank our colleague Clare Shelley-Egan for important discussions throughout the process and comments on earlier drafts. We also thank the two internal reviewers in the RRI-Practices for their invaluable feedback on an earlier draft. Our greatest thanks go to our main collaborators in the two organisations, though: Special advisers Elisabeth Gulbrandsen, Helge Rynning and Ellen Veie in the RCN, and Vice-Rector for Research and Development Morten Irgens and Research Director Kristin Sverdrup at OsloMet. Without the commitment and support of these individuals – RRI champions – this work would not have been possible. In addition, we wish to thank other good collaborators and informants in both organisations.

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3. Methodology

3.1 Analytic approach

In RRI-Practice we build on an organizational institutionalist approach to theorize about organizational change in the context of RRI. With the RRI-Practice project we seek to i) harvest experiences on how research conducting and research funding/policy organisations work to strengthen RRI related values, ii) support the systematic development of such work in these organisations, and iii) generate scalable knowledge about effective practices for the wider implementation of RRI. We have followed the framework presented in the original research proposal and the more specific protocol developed at the start of the project (RRI-Practice Deliverable 2.1).

In the protocol, reference is made to ‘structural issues,’ ‘cultural issues,’ and ‘Interchange dynamics.’ These categories are derived from Scott’s paradigms or perspectives seeing organizations and organizing as ‘Rational,’ ‘Natural,’ or as ‘Open Systems.’ (Scott 1987)\(^2\). The purpose of using a simple framework consisting of these overall labels was to provide a relatively easily applicable structure to an otherwise quite complex study. However, it should be noted that the rational paradigm theoretically comprises more than structural issues, the natural more than simply culture, and the open systems paradigm go beyond what readily lends itself to the concept of interchange dynamics. Scott’s original analysis, underpinning the paradigms, is historiographic in nature, and relies on a review of theorizing on organization since the inception of the field. Historically, each paradigm has been dominant in some periods, and less prominent in others. They each characterize a way of looking at organizations and organizing, shared across researchers. However, each paradigm is not mutually exclusive, and they each - in their particular way - continue to shape and frame organizational scholarship (Scott and Davies 2007)\(^3\). As the main purpose of this project’s work is not to advance organizational institutionalist scholarship, but to understand organizations in practice, we have allowed ourselves to simplify Scott’s rich account into a practicable analytic framework. Scott’s approach has been used in similar analyses by Boyle et al. (2001)\(^4\) and Forsberg et al. (2012)\(^5\).

RRI is a practice, an academic discourse and a policy concept. In all three modalities, it is contested and have plural definitions and operationalisations. RRI is by the European Commission presented as comprising five keys or thematic elements (public engagement, open access, gender, ethics and science education)\(^6\). In the academic literature RRI is often referred in terms of the so-called AIRR dimensions (‘Anticipation,’ ‘Inclusion,’ ‘Reflection,’ and ‘Responsiveness’) (Stilgoe et al. 2013)\(^7\). In other words, RRI is a complex construct, concept, or idea (the RES-Agora project called this RRI-in-the-making), not unlike other ideas studied in the diffusion literature (see Newell et al. 2000)\(^8\). This diversity makes it a difficult concept to ‘implement’ in organizations. For our purposes, however, we can simply note that the RRI

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6 Sometimes ‘governance’ is included as a sixth key.
concept has an ethical core, with practical implications for the organization of work practices, while not directly targeting improved efficiency from a classic throughput or production perspective. We will in this report not discuss the RRI concept or its genesis in any further detail, but refer the reader to for instance Stilgoe et al. (2013).

3.2 National mapping

3.2.1 Document analysis
The purposes of the document analysis at the national level have been to (1) analyse the national institutional context for RRI and (2) understand the main societal and political discourses of RRI and the ways in which these are framed and have been implemented.

The document analysis at the national level included relevant policy documents issued by different ministries and other stakeholders having national responsibility for particular issues related to research, innovation and RRI-keys. The main stakeholders that issued documents relevant for the study are the Ministry of Education and Research, the RCN, the Norwegian Board of Technology, the Committee for Gender Balance and Diversity in Research (KIF) and the Norwegian Association of Higher Education Institutions. The search strategy consisted of:

- screening of internet pages to the named stakeholders (and others) for relevant documents using Norwegian translation of RRI-keys and dimensions coupled with research/innovation as search words;
- screening other relevant Norwegian internet-resources such as www.openaccess.no (the internet resource with updated information on OA-policy and practice in Norway), www.regjeringen.no (the official internet pages of the Norwegian government), www.nsd.uib.no (Norwegian Centre for Research Data) and www.fpol.no (internet version of Research Policy magazine (Forskningspolitikk) which is an open and independent body for academic analysis and debate on research, higher education and innovation);
- snowball-approach where potentially relevant references identified in the relevant policy documents were googled and reviewed, which was in particular useful for identifying practice of different aspects of RRI.

Over 50 documents were identified as relevant for the analysis. These were white papers, national strategies, laws and national guidelines. Many of the documents were quite old (issued before 2010) and thus have not been used as the main source of data, but informed to some extent the historical development in particular RRI areas. In total about 10-15 newer and currently valid documents as well as relevant internet pages mentioned above constituted the basis of the in-depth document analysis at the national level. These were analysed according to a pre-defined structure for chapter 5 covering RRI-keys and research process dimensions, as well as uses of the terms “RRI”, “responsibility in research and innovation” or other similar/competing concepts.

3.2.2 Interviews
Two national experts were interviewed that provided us with information and reflections on the history and important discussions pertaining to RRI in Norway, and other experts were consulted more informally.

3.2.3 National workshop
The national workshop on RRI took place on February 2nd 2017 at OsloMet – Oslo Metropolitan University (then HiOA).

The participants in the workshop represented different organizations, areas of authority and functions in the Norwegian research- and innovation sector:
• The Norwegian Ministry of Education and Research has national responsibility for day care institutions for children, primary and secondary schools, high schools, higher education and adult education. The Ministry also has national responsibility for research.
• The RCN is a national research strategic administrative body under the Ministry of Education and Research. RCN administers research funds from all the Ministries in the Government and funds research in all disciplines, basic research, applied research and innovation. RCN also advises the Government and state authorities in relation to questions concerning research and innovation politics.
• Innovasjon Norge (Innovation Norway) is an organization owned by the Norwegian state and the counties as their instrument in distributing funding for realization of innovative projects leading to commercial development in Norway.
• The Norwegian National Research Ethics Committees is an administrative body under The Ministry of Education and Research. The committees contribute to processes where research in private or public settings are conducted in accordance with the national ethical guidelines for research through investigations into specific cases, advisory activities and information work.
• The National Committee for Research Ethics in Science and Technology (NENT) has responsibility for questions concerning research ethics in science and technology, industrial-, agricultural- and marine research, as well as the parts of bio- and gene-technological research not covered by medical research.
• The Norwegian Board of Technology is an independent, public body that gives advice concerning new and emerging technologies to the Parliament and the Government.
• The University of Oslo (UiO) is Norway’s largest, oldest and highest ranked university. UiO has a range of research centers, seven of them with Excellence status, and is directly involved in innovation through commercialization of research results and through cooperation with external companies. UiO is the only Norwegian university to be among the 100 most innovative in Europe.
• OsloMet – Oslo Metropolitan University (then HiOA) is specializing in professions like nursing, education, engineering, journalism and social work.
• Civita is a liberal-conservative think tank engaged in public debates, analyses and publications about politics and society.  

3.3 The organisational studies

3.3.1 Document studies and interviews

The organizational studies were based on qualitative, exploratory case study methodology. They consisted of the document studies and interviews of representatives from the organizations. The studies followed the protocol, interview guides and analytical framework developed in the project and applied to all case organizations studied in the project.

Document studies included reviews of both internal organizational documents and external documents. Internal documents for RCN and OsloMet that contributed to the report are official policy documents and internet pages for the employees. Examples of the documents reviewed are strategy documents, guidelines, annual reports, evaluations, action plans and information sheets highlighting different aspects of responsibility and the keys in the organizations. The review of the external documents included laws, national guidelines, policies, white papers, budget letters from the Ministry of education, national reports for higher education institutions, etc.

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In addition to the document studies, we conducted a number of individual semi-structured interviews with representatives (interviewees) from the organizations, from different divisions and departments and at different hierarchical levels. We distinguished between ‘topic related interviews’ and ‘chain of command interviews’:

- ‘Topic related interviews’ were interviews with employees with specific functions related to the different RRI aspects or responsibility/RRI in general. These interviews aimed to gain information on mandates, official structures and the development of policies/discourses and practices within the organisation.
- ‘Chain of command interviews’ were interviews with individuals at different levels in the chain of command. These interviews aimed to gain understanding how the policies work in practice.

At OsloMet the interviewees from the ‘chain of command’ represented all the faculties at the university. From these faculties we selected certain institutes that were research intensive and included scientific fields of particular relevance for RRI. The choice of institutes was agreed with the university’s Research Director. The institutes selected for interviews were Department of Nursing and Health Promotion at the Faculty of Health Sciences, Department of Primary and Secondary Teacher Education at the Faculty of Education and International Studies, Department of Computer Science at the Faculty of Technology, Art and Design, Consumption Research Norway (SIFO) at Centre for Welfare and Labour Research and Oslo Business School at Faculty of Social Sciences.

At RCN we interviewed both advisers and special advisers with special responsibility for the keys and advisers and special advisers located in the Division of Innovation focusing specifically on RRI.

Analytically, the organizational studies are structured more or less according to the analytical framework developed in the project. One exception is the conceptualization and practice pertaining to responsibility and RRI in RCN were we expand on the framework by exploring their understanding of RRI as a learning process. Overall, we were concerned with understanding current status and practice of different RRI-aspects in terms of existing organizational structures (ex. mandates, legislative frameworks, and formal hierarchies), cultures (ex. informal routines, informal reward systems, and focus on management) and interchange dynamics (ex. policy learning, pressures from key stakeholders). We also wanted to investigate potential barriers and drivers for promoting further the RRI-policy framework as a whole and its particular aspects.

3.3.2 Focus group and Outlook process
An important part of the work was to develop so-called Outlooks for the two organisations. These were recommendations and suggestions for further strengthening of RRI in the organization, based on the reviews and discussions with organizational stakeholders.

Outlook-process at OsloMet
The draft of the organizational report was discussed with the key stakeholders in a workshop in February 2018. Based on these discussions the project researchers developed suggestions for actions which were discussed in a meeting between the researchers, the Director for research, the Vice-rector for research and the adviser on open access in May 2018. The project researchers then recorded the agreed points in an Outlook. A summary of the internal review findings, as well as the Outlook including an action plan, were presented and approved by OsloMet’s R&D Committee on 14.06.2018. The researchers then took an initiative to establish a working group on RRI training as well as to make available RRI tools in coordination with the Communication department.

Outlook-process at RCN
A document describing the background findings for the Outlook was presented and discussed with the
key stakeholders in RCN in a workshop in February 2018. Based on these discussions we have developed suggestions for the Outlook which were discussed in a meeting between the key stakeholders and a researcher from RRI-Practice in June 2018.

4. The context for RRI: the national science policy system

4.1 General country information

Norway is a constitutional monarchy and parliamentary democratic nation state in Scandinavia, with a population of 5.3 million. Norway has an indigenous Sami population as well as five national minorities, defined as groups with a long association with Norway. The official languages in Norway are Norwegian and Sami, while Kven, Romani and Romans are recognised as minority languages. Norway borders to Sweden, Finland and Russia and has been a fully independent state since 1905, after centuries of union with Denmark and then Sweden. Norway was occupied by Nazi Germany during the second world war. It has a long coast line, large mountainous areas and a significant part of the country north of the Arctic Circle. The population density is 15 per square kilometer, and 81 % of the population is urban, with the population of the capital Oslo being 650 000.

Norway is among the richest countries in the world with an economy based on natural resources like oil, gas, hydro energy and fish. The unemployment rate in Norway in 2018 is 3,7 percentage. In 2017 33,4 percentage of the population had a degree from either a university or a university college. Norway’s gross domestic product (GDP) was in 2016 370,6 billion USD; 70 812 USD per capita. This will vary slightly related to changes in the oil price. While Norway had the highest GDP per capita in Europe apart from Luxembourg for several years (200-2014), this changed with the reduction in oil prices in 2016. Still, Norway has approximately 50 % higher GDP per inhabitant than the mean in Europe.

Norway has a central government, as well as a regional and municipal government level. Most research is funded at a national level, but there are also regional research funding mechanisms in order to encourage more R&D in regional enterprise and research conducting organisations.

After two popular votes (in 1972 and 1994) Norway has decided not be a full member of the European Union (EU), but is a member of the European Economic Area (EEA). This gives the country access to the European internal market but does not allow for membership in the formal EU decision making process. However, Norway can give input during the preparatory stage. Under the EEA Agreement, Norway and Norwegians have the same rights and obligations as other EEA countries and their citizens when it comes to trade, investments, banking and insurance, and buying and selling services. They also have the same right to work, study and live in other countries in the EEA. Under EEA, Norway agrees to the ‘four freedoms’: free movement of goods, free movement of people, freedom of establishment and the right to provide services, and free movement of capital. The Efta court ensures that Norway comply with the EEA Agreement.

Norway annually pays approximately 1 billion euros to the EU, as a contribution to reduce social and economic disparities in Europe and as contributions to the EU programmes and agencies Norway participates in. Norway also receives money from the EU, for instance through the EEA/Norway Grants scheme and European research grants. Norway participates in European research funding programmes, as the current Horizon 2020 programme. According to the Norway daily newspaper Dagens Næringsliv (July 18th 2018), there is uncertainty regarding the future participation of Norway in the European Union.

10 https://www.regjeringen.no/en/topics/european-policy/eos/id115261/
Research Area, as a recent proposal by the EC suggests to limit such participation to full EU members\(^\text{12}\). It is of high importance to a small country like Norway to remain in the European Research Area (ERA) and such continued membership is a priority of the Minister of Education and Research.

Norway has a relatively equal distribution of income, with a low score (26.8%) on the World Bank Gini index\(^\text{13}\) (indicating low inequality). Norway has a well-developed social welfare system, however, with the aging population, it is projected that inhabitants’ individual expectations of social welfare goods in the future must be reduced relative to today.

The Norwegian science system consists of\(^\text{14}\)

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Research funding is channelled through the RCN, but there is also direct funding from individual ministries to sector institutes and the public health enterprises. The so-called sector principle means that each ministry has the responsibility for policy development and long term knowledge development in their respective areas. The Ministry of Education and Research has a coordinating function. OECD and the Norwegian Productivity Commission (NOU 2016:3) has criticised the sector principle for leading to a fragmented research policy. New guidelines for the ministries have therefore been developed to ensure better integration\(^\text{15}\).

The total investment in R&D was in 2016 more than 63 billion NOK\(^\text{16}\). This number combines public and private spending. Industry spending on R&D is a substantial part of this. Statistics Norway monitors R&D in the business sector and write in their 2018 report:

- There is still growth in R&D activity in the business sector. In 2016 the R&D costs amounted to NOK 29.5 billion, 6.1 percent higher compared with 2015. However, the growth is more moderate than the high growth in the two previous years (2014 and 2015).
- Growth in the businesses’ R&D activity in real terms has been stronger than in Gross Domestic Product (GDP) in recent years, resulting in increased R&D as a share of GDP. The share was 0.71 per cent in 2010 and 0.95 in 2016. As share of GDP for mainland Norway, the proportion has increased too\(^\text{17}\).

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\(^{14}\) Diagram inspired by a presentation by the former Director of the RCN, Arvid Hallén.

\(^{15}\) [https://www.regjeringen.no/no/aktuelt/vil-koordinere-forskningsinnsatsen-bedre/id2570121/](https://www.regjeringen.no/no/aktuelt/vil-koordinere-forskningsinnsatsen-bedre/id2570121/)


4.2 Legal and other binding normative framework

Legal and other binding normative frameworks are related specifically to individual keys and are treated under their respective keys in chapter 5.

4.3 Political and cultural values and discussions related to STI

The political discussions in Norway are slightly different regarding research, technology and innovation. The Ministry of Education and Research has responsibility for research policy and has been quite active in policy making in the area. The Ministry earlier issued Parliamentary whitepapers on research every four years and is now issuing a “Long term plan for research and higher education”, to be issued every six years. Innovation policy is the responsibility of the Ministry of Trade, Industry and Fisheries and has traditionally had a less central position in this ministry than research has had in the Ministry of Education and Research. There has only been one White paper on innovation, published in 2007. Even if technology can be related to both research and innovation, most technology policy has been connected to the Ministry of Education and Research, perhaps simply because there is more research policy than innovation policy.

There are many strategic papers on specific technologies (biotechnology, nanotechnology, ICT, etc.) issued as a collaboration between ministries (see below and annex F). Other important governmental initiatives have been the so-called ‘21 processes’. These are ‘actor driven, national strategic work commissioned by the government or a ministry to further research based value creation and development in important societal areas’\(^\text{18}\). They have been conducted in the fields of energy, climate, oceans, ICT, etc., and aim to create awareness, collaboration, legitimacy for analysis and strategy, increase of resources, and better definition of research needs.

An important framing of Norwegian research and innovation policy revolves around what we will base our economy on after the oil age. Historically, large sums have been spent to support the traditional Norwegian industrial sectors, which means that we have built up large capacity for instance in the petroleum sector where research, technology and industry have been close collaborators. This makes it challenging to make the transitions to the post petroleum age. Companies in such sectors often need to find required R&D competence outside of Norway\(^\text{19}\). Furthermore, critics claim that there is an alleged mismatch between the priorities of the public research system and the needs of Norwegian businesses. For instance, life science research receives large public sums as funding directly to the public health enterprises, but Norway has not (at least not until recently) had a developed health related business sector that could make use of this research, leaving mostly the hospitals as the users of research.

Historically, Norwegian research policy has focused on thematic priorities. The priorities in the current long term plan are: the oceans; climate change, the environment and environment-friendly energy; public sector renewal and higher quality, more efficient welfare, health and care services; enabling technologies; an innovative, adaptable private sector; and world-class research groups. The overarching objectives are: To strengthen competitiveness and innovation capacity; to solve major challenges to society; and to develop high-quality research groups (see also Annex F). The priority areas are broadly


defined and are to have a mobilising function and provide a direction for further decision making. Annual R&D statistics follow up on these priority areas.

A unique feature of Norway is that the country has more humanistic sciences and significantly more social sciences than most other countries, as well as significantly less technological research. There is collaboration between the state authorities, the public sector and researchers which result in a rather extensive social research sector that provides much of the knowledge base for policy developments in Norway.

When it comes to innovation, the word ‘innovation’ was likely first used in a public paper by the Thulin commission in 1980, but has increasingly become more important. Innovation Norway was established in 2003 in order to stimulate innovation in private enterprise throughout the whole of Norway.

An important discussion in Norwegian innovation policy has been the so-called ‘Norwegian paradox’, described by Per Koch, then employed in the RCN. This proclaimed paradox is that Norway has had a low score on innovation input (R&D spending as percentage of GNP), but still score well on output factors, such as productivity, an efficient public sector, etc. There are several possible explanation of this ‘paradox’. One is that the country’s industrial structure (resource based industries should as petroleum and fish) is different from other European countries, and this must be adjusted for in the assessments. Another is that we have a small, networked, collaboration based economy, so research input will often be accessible for a broader range of actors, and this synergetic effect is difficult to measure. Finally, technicalities in the Norwegian data collection have been different than in other countries’ data collection, accounting for some differences in results. There is most likely substantially more innovation activity in Norwegian enterprise than what is picked up in assessments.

Another common STI discussion in Norway is about size. The RCN is a result of a merger of five formerly independent research councils and Innovation Norway is a result of a merger of four formerly independent organisations. There has historically been much discussion of this integration. It has for instance been claimed that business oriented research is losing out with only one research council. Moreover, the whole research and innovation system is now largely influenced by the actions of these two organisations; there are few other organisations that can bolster the effects of these large players on vulnerable actors. However, the two evaluations of the RCN have confirmed that this merger has been the right strategy, among other things, to counteract the fragmenting force of the sector principle (see above).

There is generally a tendency towards integration in the whole research system in Norway. Former university colleges have been merging to become larger full universities, sometimes including formerly independent contract research institutes in the process (such as the case of OsloMet). Some such institutes have also merged to larger institutes (for instance the new large institute Norce). The institute sector in Norway is thus becoming smaller. There is still a relatively fragmented and decentralised governance of the institute sector, even if the RCN has a coordinating responsibility, e.g. through distributing basic funding and through regular evaluations of the institutes. However, some institutes are funded directly from their respective ministries.

The underlying goal of the governance of the research system is to ensure research quality and the productivity and relevance of the research system. There is to a large extent consensus about Norwegian research policy across the political parties, although the parties differ slightly in their will to fund R&D. In 2016 the contribution of research and innovation to the Norwegian economy amounted to

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20 [https://libraryconnect.elsevier.com/articles/norwegian-paradox](https://libraryconnect.elsevier.com/articles/norwegian-paradox)

21 See for instance [https://www.sv.uio.no/english/research/applied-knowledge/examples/strengthening-innovation-in-telenor.html](https://www.sv.uio.no/english/research/applied-knowledge/examples/strengthening-innovation-in-telenor.html)
63 billion NOK. The goal is that 3 % of GDP should be for R&D, and Norway’s current status is 1.9. Public spending is on track, but the private sector still does not contribute sufficiently (though this might be due to the way such spending is registered, ref. discussion above). Public spending has dramatically increased, with a real growth of 3-4 % every year for approximately 15 years. The 3 % target is, however, a troublesome target for Norway, as our GDP is high and somewhat sensitive for fluctuations in oil prices.

A final point to make about Norway related to governance of the research and innovation system, is to point out that Norway is a small country, with very much informal communication as many actors in the research system know each other. This means that much governance happen in a dialogical way, through coordination, with somewhat less need for steering through indicators. 22

With regard to RTI related value discussions in the media, we have not conducted a media analysis in the project. Research policy is most thoroughly discussed in magazines like Forskningspolitikk, Forskerforum, forskning.no, khrono.no and university magazines and reflect the policy discussions summaries in this chapter and in chapter 5. Cases with ethical implications regularly reach the newspapers, as do often-hyped cases of promising research and technologies (curing cancer, artificial intelligence, self-driving cars, etc.), but research policy is not high on the media agenda, perhaps because of the previously mentioned political consensus in this field.

The Norwegian population’s attitudes to science and technology are regularly studied. In 2017, a study commission by the RCN and carried out by Kantar TNS showed that 40 % agreed that research results to a large extent is coloured by the researchers personal political attitudes and opinion; however, the disciplines are perceived differently. 70 % believe that politicians only use research results that support their own opinions. 46 % believe that research results ‘are bought’ by industry or government, and that they are thus not trustworthy. However, this study has been criticised and the results doubted. 23

Norway has also been included in the Eurobarometer special study on biotechnology and emerging technologies in general from 2010 25. Here, it is shown that the Norwegian population is the one with the highest awareness of genetically modified (GM) food (96 %) and nanotechnology (78 %) in the survey. At the same time, nanotechnology and animal, plant and human biotechnology appears to have relatively high levels of acceptance in the survey. For instance, 82 % of the Norwegian population would be willing to provide personal information to biobanks. Interestingly, the survey shows that 43 % of Norwegians have one in their family who has (had) a job or higher qualification in natural science, technology or engineering, which is the highest among the countries in the survey. This report shows that the Norwegian population is among the most technology friendly in Europe.

5. Aspects of responsibility in national science policy

5.1 The conceptualisations of responsibility in national science policy

The main national actors in terms of science policy in Norway is The Ministry of Education and Research and the Government, which regularly issue white papers on research and innovation related topics. Responsibility has increasingly been addressed in these papers, connected to environmental sustainability, problem solving pertaining to societal challenges and issues of more ethical nature, like transparency and democratic dilemmas.

22 Our thanks go to Professor Magnus Gulbrandsen at the Department of Innovation, Technology and Culture at the University of Oslo, for input to the sections above in this chapter.
One may identify three phases of policy development related to responsibility and research.

2000-2008: Focus on competence and knowledge building, emphasizing new and emerging technologies as a tool for value growth and establishing new areas of scientific excellence (see annex F for references).

- Strategic priorities emphasize research quality, building competitive scientific areas and a platform for value creation
- Emerging technologies (bio- and nano) are to varying degrees characterised by a strategy of funding basic research, but informed by a long-term strategy towards applied research and cooperation with industry.
- The role of ethics and societal responsibility is mostly linear, emphasising research ethics and bioethics, building up ethical expertise through committees and academic applied ethical expertise.
- Responsibility is perceived linearly, from the research institutions towards society through ‘dissemination’, and where the RCN should be responsible through outreach and ‘informing’ the public.
- Biotech/marine sector emphasis on sustainability, industry growth and innovation, excellence, and responsible management of resources for the public good (quotas, regulatory frameworks), including commitment to environmental adaptation, ethics and animal health determining common ‘national norms’.

2008-2012: Focus on the shift towards ‘global’ or societal challenges (energy, climate). Strategic research programmes seem to have a more prominent policy role and more emphasized as a policy tool. The strategy represents a move away from pure excellence and basic/applied research distinction towards specific and strategic policy objectives (clean energy, environmental research).

- More emphasis on transdisciplinary research
- Less linear approach, more Mode 2
- RCN’s role is more prominent as a societal actor and as an active agent in the implementation of strategic research policy
- Ethics and “responsible” technology development as an intrinsic instead of as an extrinsic factor in strategic research

Two examples here are the National Strategy for Biotechnology (2011-2020) and the National Strategy for Nanotechnology

In the National Strategy for Biotechnology (2011-2020), the term “robust technology development” denotes issues such as research ethics, privacy, consent, confidentiality, reservation-registers, with ELSA (Ethical, Legal and Social Aspects of new technologies) as a key concept. According to the strategy, considerations of ELSA are central and must be integrated ‘clearly’ into projects, programmes and initiatives and ‘not peripheral’ to technological development. (p. 8). Uncertainty is acknowledged and it is held that the precautionary principle should inform responsible action from government, organizations and individuals, in open dialogue with stakeholders.

The National Strategy for Nanotechnology (2012-2021) had the aim of developing basic knowledge through international cooperation, including H2020, and promote safe development of nanotech by

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28 https://www.regjeringen.no/contentassets/5aa4911bcb474c0da4f21d1dcbc47ecb/63867_nanostrategi_web.pdf
making the EU Code of conduct for Responsible Nanoscience’s and Nanotechnologies research\textsuperscript{29} norm for national R&D. There was a focus on Health, Environment and Safety (HES) issues, including mapping of the industry, products and networks for HES, and regulatory adjustment for working conditions, products and medical appliances. Involvement by Norwegian companies was recommended to contribute to increased competitiveness of Norwegian industry and better handling of societal challenges without unwanted effects on health, environment or society. ELSA and HES research components in publicly funded research should be at a level among the leading countries internationally and integrated in the technology development within academia, industry, health institutions etc., as integral components of technology projects.

2012-2015: Focus on a continuation of a thematic emphasis (from previous white papers) on “strong areas”: environment, climate change, oceans, food safety, energy, etc. These areas are to support welfare and health challenges. There is more emphasis on ‘transparency’, increased stakeholder focus, and deliberative practices and on building down disciplinary and sectoral boundaries to meet challenges and increase value growth: more allocation of resources to interdisciplinarity. In addition:

- More focus on EU-project participation
- Addressing climate change and environmental challenges by integration of commitment by both technical social sciences, technology and humanities in order to understand and handle effects of these changes and address them.
- Increased focus on enabling technologies (bio/nano/ICT) in an explicit ‘responsible manner’.
- Focus on “ethics” and responsibility; Oceanmarine research, enabling technologies and “responsible technology development”
- Focus on multi-disciplinarity and “integration”; “convergence” and policy as cross-disciplinarity.

An example here is the “Long term plan for research and higher education 2015-2024”\textsuperscript{30}, which includes a distinct phrasing of ‘responsible technology development’. This phrase emerged prior to the emergence of the RRI concept and is used in the context of ocean/marine research and enabling technologies. It involves a focus on multidisciplinarity and “integration”; “convergence” and integration, and policy as cross-disciplinary (see also annex F).

In terms of research funding and policy development the RCN is the single most important actor, and the RCN has followed up on the signals from the White papers with regard to responsibility. RCN’s current main strategy bears the title “Research for innovation and sustainability – Strategy for the Research Council of Norway 2015-2020”. In this document it is explicitly stated that earlier strategies for the RCN have been based on the notion of research as a goal in itself rather than a notion of research as responsible or as a social responsibility. While reassuring that the RCN is responsible for providing for research being done on its own terms and as a goal in itself, it is also stressed that societal challenges to a greater extent must be put on the agenda of research because research and innovation increasingly is becoming part of the solutions to the challenges our society is facing. The main strategy for RCN towards 2020 thus clearly reflects RCN’s appropriation of its role as a social actor of change and the Council’s broader social responsibility.

5.2 The notion of ‘RRI’ in national science policy discussions

The analysis of the national policy documents has not identified RRI as a concept in use. However, as this chapter will highlight, particular RRI keys and research process dimensions are well developed on the

\textsuperscript{30} https://www.regjeringen.no/en/topics/research/innsiktsartikler/langtidsplan-for-forsking-og-hogare-utdanning/id2353317/
policy levels. This was confirmed in discussions at the national workshop: RRI as a concept is only to a small extent applied in the main national institutions. Except for the RCN that has developed an RRI-framework to guide several of the main research programmes (see Chapter 7), no other organizations have so far applied this concept or mentioned it in their policy documents. However, the Norwegian Board of Technology reported in the national RRI workshop that AIRR could be seen as their main methodological approach in their involvement of citizens in discussions about emerging technologies, in their scenario activities and in the ambitions to be a continuously learning organization.

Most of the ideas and concepts that underpin RRI were used in different ways by the participants. Issues brought us were involvement, ethical reflection, the importance of science, science education and trust building in a time of public distrust towards science and politics, integrity and transparency, open access and gender balance in the research institutions, anticipation and engagement in the light of emerging technologies, social and environmental sustainability, and the further development of institutional practice pertaining to responsibility in the research and innovation sector.

To a large extent, the workshop participants translated their ongoing practices into the RRI concept, and especially into the keys. Many also held that responsibility for research and innovation must involve addressing social needs, and that society must be more involved in discussions about the consequences and uncertainties associated with research and innovation. Openness was generally considered to be important.

Some perceived that there was an unclear connection between the concept of responsibility in research and innovation and specific values such as gender balance or science education, while others believed that RRI was a good concept for gathering different types of activities in a more integrated understanding. Some were critical of the EC’s definition of the various keys; for example, why it is focusing on gender balance in particular and not on diversity more generally. Some proposed expansion of the keys to include for instance sustainability. Others wanted RRI to stand for a more fundamental change in the relationship between society, research and innovation, and thought that the keys were rooted in an outdated discourse.

All in all, the participants in the national workshop were positive about RRI, and considered it crucial to the further development of the national discourse on responsibility in research and innovation in Norway.

An interview with a Norwegian RRI expert confirmed that the term RRI is mostly used in research funding organizations (particularly RCN) and in research environments with an academic interest in RRI. The expert also held that the majority in the Norwegian RRI academic community are against the interpretation of RRI as keys as it may narrow the responsibility of researchers down to check-lists and water down its meaning as a concept signifying a (radical) reconfiguration of the relation between science and society.

Other concepts in use
As mentioned above, “responsible” and “robust” technology development have been used in Norwegian research policy. The term “corporate social responsibility” (CSR) is another well established concept that has been in use in Norway for many years. In 2015, RCN connected RRI and CSR under the new research funding program SAMANSVAR (programme on responsible innovation and corporate social responsibility). The concept of CSR is also adapted for higher education institutions as many policy documents emphasize their social role and social responsibility. The concept of CSR is also in use in relation to research in terms of “social responsibility of research”. For instance Guidelines for research ethics in science and technology developed by The Norwegian National Committee for Research Ethics in Science and Technology describe social responsibility of research in terms of (a) research’s
independent responsibility for its own role in societal development; (b) research’s responsibility to contribute to greater global justice and (c) research’s responsibility to be consistent with sustainable development.

“Open science” is at the time an emerging concept which is debated to some extent in academic circles, but is still not articulated in the policy documents. “Sustainability” and “sustainable development” have for decades been important policy concepts in Norway and continue to be components of responsible research, technology and innovation policy and practice.

5.3 Ethics in the national science system

A. Description of the practice and its development

In the national science system The Norwegian National Research Ethics Committees is an administrative body under The Ministry of Education and Research. The committees shall contribute to processes where research in private or public settings are conducted in accordance with the national ethical guidelines for research through investigations into specific cases, advisory activities and information work.

In Norway, regional committees for research ethics in medicine (REC, i.e. ethics review boards) were established in 1987, as part of an international trend. The national research ethics committees were established in 1990. Whereas many countries have national research ethics committee for medicine, a special case in Norway was the establishment of a national committee for social and humanistic sciences (NESH) and for natural science and technology (NENT), and not just for medicine (NEM).

The national committees were traditionally expert based, but NENT experimented early with methods for involving a broader range of societal groups (see Forsberg 2003, in Norwegian). In 2007, NENT developed new ethical guidelines for the natural sciences and technology (revised in 2015). These were inspired by the statement from the World Conference on Science in 2000/2001 (http://www.unesco.org/science/wcs/newsletter/proceedings.htm). These guidelines were controversial as they started by stating that research shall contribute to peace, democratic development and increased global social justice. This was controversial for those that believed that research primarily should be aimed at truth-seeking and that research should be free of specific societal objectives (nowadays, the mission orientation of research is more broadly accepted). As such, NENT’s work can be seen as a precursor to RRI. Matthias Kaiser and Roger Strand were driving forces for these guidelines and are important proponents for RRI today.

Other important national institutions for considering ethical issues in research are

- The Directorate of Health’s Reference group for issues related to biotechnology and biomedicine (Helsedirektoratets referansegruppe for spørsmål om bioteknologi/biomedisin (Bioreferansegruppa))
- The Biotechnology Advisory Board

34 http://www.bioteknologiradet.no/english/
- The Board of Technology (this is a Parliamentary Technology Assessment board, but frequently deals with ethical questions)35

Norway is also special as it has an Act for Research Ethics. The first Act was published in 2007: ‘Act no 56 About the treatment of ethics and integrity in research’. The purpose of this act was to contribute to the goal that public and private research is conducted in alignment with acknowledged ethical norms. The Act made it clear that it is the research organisations that have the primary responsibility for preventing and handling allegations concerning research misconduct, but also established the National Commission for the Investigation of Research Misconduct. Institutions may redirect an investigation to the Commission if, for example, a case is deemed particularly complicated, has received considerable public attention or due to possible conflicts of interest. The Commission may also decide to investigate a case under authority of the law on misconduct at its own initiative.36 The law defines research misconduct as “falsification, fabrication, plagiarism and other serious breaches of good research practice that have been committed wilfully or through gross negligence when planning, carrying out or reporting on research”.

The Act was updated in 2017. The revision strengthens the responsibility of the research conducting organisations with regard to education and training of research staff as well as for establishing ethical guidelines and procedures for handling cases of alleged misconduct. All Norwegian research conducting organisations are therefore in the process of strengthening these kinds of procedures. Moreover, all the main Norwegian higher education institutions also conduct research into ethics of research and/or technology.

The ELSA program of the Research Council of Norway (Ethical, Legal and Social Aspects of New Technologies) has been an important funder of this kind of research. The ELSA 1 and 2 programme, as well as the current SAMANSVAR programme, has led to considerable competence among Norwegian researchers, leading to a current strong competence also on RRI.37 Dedicated funding for ELSA and RRI in the applied biotechnology and nanotechnology programmes (and recently also in ICT and other programmes) since the 1990’s, has been crucial. RRI/ELSA researchers in Norway meet annually in conferences of the ELSA Norway network (also with international attendance).38

B. Main barriers (structural, cultural or related to interchange dynamics)

There are still barriers to research ethics and integrity in Norway. The new legal requirements on the research conducting organisations require devoted resources in the organisations and increased top-level attention. Another barrier is that ethics requirements in integrated projects, for instance, in biotechnology and nanotechnology, are perceived as a tick box and in some cases treated very superficially.

C. Main drivers (structural, cultural or related to interchange dynamics)

Research ethics is broadly supported in Norwegian academia. It is well regulated, with institutions that cover a broad scope. Quickly developing fields with clear ethical implications, such as artificial intelligence, along with scandals such as Cambridge Analytica, has led to an increase in researcher and research organisation attention to research ethics. Media attention to misconduct cases, such as the Sudbø case in Norway and the Macchiarini case in Sweden, along with the new law on research ethics,

35https://teknologiradet.no/english/
37https://www.ntnu.no/blogger/elsa/people-projects/
38https://www.ntnu.no/blogger/elsa/whatiselsanorway/
has led to research conducting organisations intensifying their work on preventing misconduct and establishing whistle-blowing mechanisms and misconduct investigation procedures.

D. Best practices

The Norwegian unique best practices are described above; the broad system of national research committees, the quite ambitious ethical guidelines of NENT, the building up of ELSA competence conducted by the RCN over a long period, and the institutionalisation of research integrity into the law.

5.4 Societal engagement strategies in research

A. Description of the practice and its development

Societal engagement in research may have diverse meanings in the national policy documents and national discourse. In policy documents, announcement for research funding and academic debates, societal engagement in research is addressed differently and may signify: applying user perspective in research, co-researching, participatory action research, citizen science, network governance, and so on. For instance, the Government's action plan for the follow-up of the strategy for research and Innovation in Health and Care (HelseOmsorg21, 2015-2018) accentuates user involvement in research in RRI-terms: “Users can participate in all phases of the research and innovation process: i) identify and prioritize the theme or need for new knowledge and new methods; ii) participate in research and innovation projects; iii) participate in the assessment and allocation of research tools; and iv) disseminate results data from research and innovation projects. It is necessary to strengthen the user performance in all phases of the action-oriented (user) and clinical health and care research. The same is true in the innovation work”39.

Some organizations are more proactive with use of societal engagement strategies. For instance, the Norwegian Board of Technology, which is an independent body for technology assessment established by the Norwegian Government in 1999, has public engagement perspectives incorporated in its mandate. The RCN promotes societal engagement in research both via its RRI approach and by activating a user perspective. With regard to RRI, this will be further described in chapter 6. With regard to the latter, the RCN in its HELSEVEL program RCN defines “user engagement” in research as follows: “User involvement in research means involvement of users in the research work, decision-making processes and in the design of research needs and the concretization of research questions. The goal is more relevant and useful research and innovation through increased involvement and influence from users in prioritizing, planning and conducting research.”40

It was also pointed out at the national RRI workshop that societal engagement in research is considered important at research-conducting organizations, but the practice is not well operationalized.

With new internet and smart phone technology, new projects involving citizens in research have been developed, such as and e-platform for species observation system (www.artsobservasjoner.no) established in 2008 to engage citizens, professionals and academics into knowledge creation about flora and fauna in Norway.

B. Main barriers (structural, cultural or related to interchange dynamics)

- Lack of funding for societal engagement actions
- Lack of strategies in how to engage citizens in research in a good way

39 Government’s action plan for the follow-up of the HelseOmsorg21 strategy - Research and Innovation in Health and Care (2015-2018), Ministry of Health and Care services: https://www.regjeringen.no/no/dokumenter/regieringa-sin-handlingsplan-for-oppfolging-av-helseomsorg21-strategien/id2463030/

40 Brukermedvirkning i HELSEVEL: https://www.forskningsradet.no/prognett-helsevel/Brukermedvirkning/1254019678995
- Lack of awareness of relevant tools for such engagement
- Research projects with strong societal engagement component do not get credit for it (evaluation system challenge)

C. Main drivers (structural, cultural or related to interchange dynamics)
- Explicit calls for user engagement in funding calls
- In the fields of emerging science and technologies there is increased awareness of the need to avoid societal controversies
- A tradition of action research in parts of the social sciences
- New technologies for citizen science
- Citizen science and public engagement movement in the EU

D. Best practices
- RCN requires stakeholder and user participation in calls from most applied research programs
- The Norwegian Board of Technology promotes different methods for societal engagement to secure responsible technology developments such as focus groups for citizens, citizen conferences, etc.
- NENT has developed and actively used different kinds of citizen participation projects pertaining to the ethics of emerging technologies
- E-platform for species observation system (www.artsobservasjoner.no) established in 2008 to engage citizens, professionals and academics into knowledge creation about flora and fauna in Norway.

5.5 Gender equality and diversity strategies in the science system

A. Description of the practice and its development

According to Norwegian legislation all public institutions in Norway must take active steps to promote gender equality. This also applies for universities and independent public research institutes. RCN has national responsibility for research policy-related activities to analyse and develop gender research, gender perspectives as well as gender equality in research. The Council is also responsible for initiating, implementing and monitoring research activities within this field. Currently, the RCN is developing a framework for increasing the recruitment of women to subjects with a low percentage of women and develop initiatives to boost the proportion of women in tenured academic positions.41

The main attention of RCN has been on gender equality, gender balance and gender perspectives and not on diversity. This is not because diversity is considered to be unimportant in the organization, but because gender equality and gender perspectives influenced by state feminist discourses historically have been a strong and important element in RCNs strategies and policies. Until 2012 RCN had in its program portfolio a program dedicated to gender research. This program was terminated based on arguments that gender perspective and gender equality should now be “integrated in all research activities funded by RCN” and not something that could be dismissed in mainstream research and research programs by reference to one dedicated program taking the sole responsibility for gender and gender equality42.

In terms of gender balance, during the last ten years, the RCN has been concentrating on leadership and top management in science and research. The Initiative on Gender Balance in Senior Positions and

41 https://www.forskningsradet.no/en/Gender_issues/1195592877653
Research Management (BALANSE)\(^{43}\) seeks to promote gender balance at the senior level in Norwegian research through new knowledge, learning and innovative measures. The main arguments for the initiative is that gender balance fosters quality in research, enhances the relevance of research to society, and improves the competitiveness of research groups. The vision is that Norway will be the European leader in gender balance in top-level positions and research management.

There are also initiatives outside of the RCN, most importantly the KIF committee (Committee for Gender Balance and Diversity in Research). The KIF Committee was launched in 2004. The first committees were named Committee for Mainstreaming – Women in Science. The third committee changed its name to the Committee for Gender Balance in Research. The fourth committee was given a new mandate and a new name: the Committee for Gender Balance and Diversity in Research. The committee’s secretariat is based at the Norwegian Association of Higher Education Institutions.\(^{44}\)

The KIF committee provides support and recommendations on measures contributing to gender balance and diversity in the Norwegian research sector. In the current working period, diversity is defined as ethnic diversity. The purpose of the committee’s work is two-fold:

1. To contribute to gender balance and diversity among employees in the Norwegian research sector.
2. To contribute to working with diversity perspectives, among these gender perspectives, in research.

The fifth KIF committee has been appointed to serve from 1 January 2018 to 31 December 2021. The Committee will support and provide recommendations on measures that can contribute to the mainstreaming of the gender equality efforts at the institutions within the university and college sector as well as the research institute sector. The Committee will also contribute to an overall awareness-raising on gender balance and diversity in academia. Actors and institutions in the university and college sector and in the research institutes sector, departments and the Research Council of Norway will be able to receive advice from the Committee.\(^{45}\)

‘Kifinfo’ is a resource for those who work for an improved gender balance and diversity in the research sector, and those who are interested in issues on gender equality and diversity in science. The website was launched in 2005 on assignment for Committee for Gender Balance and Diversity in Research. The Committee’s mandate is to support and give recommendations on measures that contribute to mainstreaming of gender equality and diversity work in the institutions in the university and college sector and in the research institute sector, and thus promote gender equality and diversity.\(^{46}\)

B. Main barriers (structural, cultural or related to interchange dynamics)
While gender equality is perceived to be a national, cultural value, gender equality in research and innovation is not necessarily perceived to be of massive interest or importance to the public.

C. Main drivers (structural, cultural or related to interchange dynamics)
Gender equality is a taken-for-granted value in Norway, and visible gender inequality (also as it is practiced in cases of sexual misconduct in Academia – ref. #metoo) – gets highly negative attention.

\(^{43}\) [https://www.forskningsradet.no/prognett-balanse/Programme_description/1253964606599]
\(^{44}\) [http://kifinfo.no/en/content/committee-gender-balance-and-diversity-research-kif-0]
\(^{45}\) [http://kifinfo.no/en/content/contact-us-0]
\(^{46}\) [http://kifinfo.no/en/content/committee-gender-balance-and-diversity-research-kif-0]
D. Best practices
RCN’s BALANSE-program, described above
Kifinfo, described above

5.6 Open access and open science strategies in the national science system

A. Description of the practice and its development

Open access to scientific articles has been a Norwegian research policy goal since 2005 and has been confirmed by a number of Parliamentary statements (for instance Tilstandsrapport for høyere utdanning 2018, p. 50)\(^47\). In 2017, governmental focus on open access was intensified by a Parliamentary White paper (Meld. St. nr. 25 (2016-2017) Humaniora i Norge) giving the mandate to test a national consortium model for purchase of Norwegian humanistic and social science journals, leading to several good Norwegian journals now being gold open access. In 2017, two other national strategic documents were produced by the Norwegian Ministry of Education and Research: “National goals and guidelines for open access to scientific articles” and “National strategy for making available and sharing of research data.” The Ministry also formulated a national goal for OA to research articles: “The goal of the government is to make all publicly funded Norwegian research articles openly available by 2024”. The new national guidelines for open access to research articles sets expectations for research institutions, research funders and the wider research community to promote OA and achieve the goals set. At the same time, they represent a list of measures for government itself to pursue working to achieve OA practice.

An important current discussion in Norway is about making a national knowledge archive. There are already several archives available, such as Cristin/NORA (https://www.cristin.no/ and http://nora.openaccess.no/) and the Norwegian Centre for Research Data (http://www.nsd.uib.no/nsd/english/index.html), as well as more specific and local knowledge archives, but a need for a more comprehensive archive has been identified in the national strategy. UNIT (the Directorate for ICT and common services in higher education and research)\(^48\), established through mergers on January 1st 2018, is responsible for developing such a national knowledge archive.

In addition, the government signals that the mechanism for results based redistribution (RBO), which is a substantial monetary research incentive from the government, in the future will be based on open access publications only. RBO is distributed to research conducting organisations based on different mechanisms, including scientific publishing. It is the government’s intention that once the national knowledge archive is in place this part of RBO will only be based on publications deposited in the archive. Anticipating such a change, institutions (like the University of Oslo) have started to introduce similar criteria for the distribution of internal publication incentives.

The RCN has published new principles for OA which e.g. include specific requirements for OA of all academic articles published from the research fully or partly financed by RCN.

The current attention has proven successful. In 2015, only 16% of academic articles produced in Norway were open access\(^49\). In 2017 this was increased to 50 %\(^50\).

\(^{47}\) https://www.regjeringen.no/contentassets/eb4e02ae65134e42bba060e879536675/oppdatert-publiseringversjon-tilstandsrapport-2018.pdf

\(^{48}\) https://www.unit.no/

\(^{49}\) National guidelines on open access to research data: report to the Ministry of Education: https://www.regjeringen.no/contentassets/72e9794a183647e5b53ec39ba8cf516a/rapport-nasjonale-retningslinjer-for-apen-tilgang-til-forskningsresultater.pdf 14.06.2016

\(^{50}\) https://www.forskerforum.no/halvparten-av-norske-artikler-apent-tilgjengelig/
B. Main barriers (structural, cultural or related to interchange dynamics)
- Polarised views on OA vs. academic freedom in the academic community
- An internationally dominated subscription-based publishing economy
- OA can be seen as an expensive alternative without a suggested financial solution for the transition.
- Gold OA-journals viewed as of less quality or prestige.

C. Main drivers (structural, cultural or related to interchange dynamics)
The National developments in OA-areas have in many ways been inspired by the international movement for open access, EU’s policy in this area and the impact it had on both national and international research-funding organisations. In recent years, the international initiative on improving evaluation of research output also plays central role. National policy documents on OA refer particularly to such drivers as:
- The San Francisco Declaration on Research Assessment (DORA)\(^51\)
- Council conclusions on the transition towards an Open Science system\(^52\)
The Norwegian government supports a transformation from subscription- to OA-based publishing economy. In addition, both societal advantages and global solidarity are used as arguments for OA, for instance with reference to UNESCO’s OA policy.

D. Best practices
- Developed national goals and guidelines for open access to research articles\(^53\) and the National strategy for access and sharing of research data\(^54\).
- National web pages on open access (www.openaccess.no) with references to policy documents, questions and answers to most asked questions.
- Developed guidelines for institutions on development of OA-policy as well as guidelines for researchers on how to relate to OA.
- The government has set a target to develop national indicators and statistics on OA.

5.7 Science education as integrated in research\(^55\)

A. Description of the practice and its development
Science education, either in an English or a Norwegian interpretation of the concept, is not easy to trace in national policy documents. Different policy documents address elements that might be linked to science education as defined in RRI, i.e., to strengthen the interest and understanding of science in the population especially through the school system. The “Long-term plan for research and higher education 2015-2024” emphasizes the importance of research education (education at PhD level) for employees in public and private sectors, viewing it as “essential for the economy so that the workforce has capacity to develop and make use of new products and solutions”. However, much of the research policy focus is placed on science communication which is defined as a third mission of higher education institutions. The focus on science communication in research policy in Norway has been strong since the 1970s and research-conducting organizations practice science communication in different forms (for example

\(^{51}\) DORA declaration: https://sfdora.org/read/ 
\(^{52}\) ‘Council conclusions on the transition towards an Open Science system’, Council of the European Union, 27 May 2016, Doc. 9526/16
\(^{53}\) https://www.regjeringen.no/en/dokumenter/national-goals-and-guidelines-for-open-access-to-research-articles/id2567591/ , Accessed 04.01.18
\(^{54}\) National strategy on access to and sharing of research data, https://www.regjeringen.no/no/dokumenter/nasjonal-strategi-for-tilgjengeligging-og-deling-av-forskningsdata/id2582412/ Accessed 19.01.18
\(^{55}\) See http://ec.europa.eu/research/swafs/pdf/pub_science_education/KI-NA-26-893-EN-N.pdf for an explanation of what is meant with this key.
chronicles in newspapers, conferences for practitioners, participation in TV and radio debates, blogging, etc.). Much of science communication is done following the classic science communication model but also in a dialogue model (Hetland, 2015\(^{56}\)). However, unclear political vision and pinpointing of science education as an important activity for research-conducting institutions’ limits the practice and its visibility.

Science is, however, made more accessible for society in museums and science clubs both at secondary schools and outside. Science education for children and youth is highly prioritized. A National strategy for science in kindergarten and primary education (2015-2019)\(^{57}\) has been developed, as well as a set of measures to increase science competence of employees and children.

**B. Main barriers (structural, cultural or related to interchange dynamics)**
- Lack of political signals that science education is a responsibility of researchers and research institutions

**C. Main drivers (structural, cultural or related to interchange dynamics)**
- There is a certain, but limited, appeal from research-funding organizations (RCN, EU) to incorporate science education in research projects

**D. Best practices**
- Yearly National research days\(^{58}\) organized by the RCN, in collaboration with the research conducting organisations, including such activities as scholars visiting secondary schools, researchers’ night, research festivals in different cities and towns, and so on.
- Developed set of methods to increase science competence of employees and children including rollemodell.no (a role model agency with dedicated scientists and technologists traveling to primary schools and high schools across the country). See the whole list of measures here\(^{59}\).
- Nysgjerrigper (described in the chapter on RCN)
- The National broadcaster NRKs science programmes for small children and youth: Kråkeklubben (The Crow Club) – a TV series about nature for children – and Newton – a TV series about science and research for both children and youth.
- “PhD in public sector”\(^{60}\) and “PhD in private sector”\(^{61}\) are financial schemes that stimulate public and private sector employees to take PhD in topics relevant for their organizations. The idea is to increase research competence and knowledge base within organizations.

5.8 Incorporation of AIRR dimensions into science policy discussions

5.8.1. Diversity and inclusion\(^{62}\)

Diversity and inclusion is in most practical respects closely related to societal engagement, and is thus discussed in this section above.

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\(^{56}\) Hetland, 2015: [https://www.forskerforum.no/forskningsformidlingens-tre-utfordringer/](https://www.forskerforum.no/forskningsformidlingens-tre-utfordringer/)


\(^{59}\) Realfagtiltak (measures for science education at school) [https://www.regjeringen.no/no/tema/utdanning/grunnopplaring/innsiktsartikler/realfag/et-felles-loft-for-realfagene1/id752797/](https://www.regjeringen.no/no/tema/utdanning/grunnopplaring/innsiktsartikler/realfag/et-felles-loft-for-realfagene1/id752797/) Accessed 04.07.2018

\(^{60}\) PhD in public sector financial scheme: [https://www.forskningsradet.no/prognett-naeringsphd/Om_Neringsphd/1253952592790](https://www.forskningsradet.no/prognett-naeringsphd/Om_Neringsphd/1253952592790)

\(^{61}\) PhD in private sector financial scheme: [https://www.forskningsradet.no/prognett-naeringsphd/Om_Neringsphd/1253952592790](https://www.forskningsradet.no/prognett-naeringsphd/Om_Neringsphd/1253952592790)

\(^{62}\) Please note that diversity is also discussed under gender above.
5.8.2. Anticipation and reflexivity

A. Description of the practice and its development

Several important national documents highlight the importance of research being able to address potential future challenges without being more specific or underlining the importance of research to be anticipatory.

That said, predictability and foresight in relation to societal development in different areas are important parts of Norwegian policy-making. Norway has a tradition of white papers on perspectives which are developed every four years\(^{63}\). These white papers are mostly based on statistics and future scenarios developed by Statistics Norway\(^{64}\). Central governmental organizations also operate with scenarios based on internal statistics.

The Norwegian Board of Technology has being anticipatory in its mandate. Examples of its practice include the project *Norway 2030* to develop future thinking in Norwegian knowledge and technology policy, as well as active use of scenario projects. Further, there are several national strategies such as “National strategy for biotechnology (2011-2020)”\(^{65}\) and “National strategy for nanoscience and nanotechnology”\(^{66}\) that define visions and priorities and serve as a guide for future developments in these areas. They particularly emphasise responsibility of research and higher education institution to produce research to secure future development in the prioritized areas.

Anticipation in the format of foresight or scenario building has also been used in the research and innovation sector, for instance by NENT in 1999 (see Forsberg and Kaiser 2000\(^{67}\)) or in the foresight programmes of the Research Councils in the late 1990’s and early 2000s. While NENT’s use of scenarios explicitly focused on ethical issues, the RCN’s foresights were of a more general, strategic nature\(^{68}\). In the period between 2003 and 2005, five larger foresight projects were conducted by the Research Council: on ICT, biotechnology, advanced materials, aquaculture and clean energy systems\(^{69}\). The Foresight programme\(^{70}\) is now closed.

We may identify a call for reflexivity in the Long term plan for research and higher education 2015-204. Here there is a perception of the relevance of ELSA directly connected to enabling technologies where the need for ‘fundamental’ ELSA research is articulated: “We need to integrate research on ethical, legal, environmental and social aspects of this commitment. Ensuring broad-based and critical research on the application of these technologies will require fundamental humanistic, social and legal research” (p. 33).


\(^{64}\) https://www.ssb.no/en

\(^{65}\) National strategy for biotechnology (2011-2020), Ministry of Education: https://www.regjeringen.no/no/dokumenter/nasjonal-strategi-for-bioteknologi/id666235/ Accessed 04.07.2018


\(^{68}\) See for instance https://www.forskningsradet.no/servlet/Satellite?cid=1200976482449&pagename=VedleggPointer&target= _blank

\(^{69}\) https://www.forskningsradet.no/prognett-foresight/Om_programmet/1226485657216

\(^{70}\) https://www.forskningsradet.no/prognett-foresight/Forside/1226485657197
The National Strategy for Biotechnology 2011-2020 (2012) acknowledges the need for reflexivity in its focus on societal debate and uncertainties, unintended consequences, conflicting values between research, industry and society, and environmental concerns.

B. **Main barriers (structural, cultural or related to interchange dynamics)**
   - While overall policy documents promote the need to be anticipatory, there are no specific requests for individual researchers or research projects to include anticipation, except in policy documents and calls for proposals in the programmes of the Division of Innovation at RCN.
   - It is often quite costly to conduct foresights and there is limited funding available for this.

C. **Main drivers (structural, cultural or related to interchange dynamics)**
   - Learning and interchange activities between organizations (see chapter 7 for an example on learning activities between RCN and the UK Engineering and Physical Sciences Research Council)

D. **Best practices**
   - Research funding for scenario development research (e.g. RCN call “Research on changes in labour market and working life” with up to NOK 70 million to anticipate adaptations are needed to develop an inclusive workforce with high employment)
   - Ministry of education project to develop an overall system for analysis and communication of future needs for competence in the society.
   - The Norwegian Board of Technology has developed scenario tools
   - Norway 2030 project in cooperation between The Norwegian Board of Technology and RCN.

5.8.3 Openness and transparency

A. **Description of the practice and its development**
   As a democratic society, openness and transparency is a key value in Norway. A number of governmental policy documents guiding research conducting and research implementing institutions promote this value. For instance, the Central Government Communication Policy highlights openness as a core value for all public organizations in Norway which implies for communication, including science communication, to be “open, clear and easily accessible.” The National goals and guidelines for open access to research articles introduce openness in terms of openness about the results of research as “a core academic value.” Openness about the results of research is also mandated in The Norwegian law on universities and higher education institutions. In general, research funding and research conducting organizations operate as public serving institutions and thus are to perform in accordance with standards of Ethical Guidelines for the Public Service. The guideline particularly emphasizes transparency in respect of the citizenry as “a prerequisite for the general public’s trust in the public services.”

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74 National goals and guidelines for open access to research: articleshttps://www.regjeringen.no/en/dokumenter/national-goals-and-guidelines-for-open-access-to-research-articles/id2567591/, Accessed 11.06.18.
service [...] freedom of information and frank discussion is essential for a smoothly functioning democracy.”

The White paper ‘Knowledge provides opportunity’ (Meld. St. 18 (2012-2013) specifically emphasises the importance of transparency in relation to stakeholder involvement in research policy.

Norway has also experience with, and developed infrastructure for, making data from public organizations open and accessible. Examples of open public data include annual accounts and budgets, results from surveys and contact information for businesses. In addition, the Norwegian Centre for Research Data has an archive system for research data and encourages researchers to save data there. The infrastructure is currently being developed further to secure more open data.

B. Main barriers (structural, cultural or related to interchange dynamics)
- Opening up internal processes more is another burden on individual staff, requiring time and resources for developing systems, publishing on websites, etc.
- Opening up internal processes (for instance in university departments or research projects) may also appear as uncomfortable as one may feel exposed to criticism.
- Opening up internal discussion processes in research may limit open discussion, as individual participants might be afraid of speaking their mind if all minutes, etc. will be made available for the public.

C. Main drivers (structural, cultural or related to interchange dynamics)
- Democratic society
- EU’s 3O strategy (Open innovation, Open science and Open to the world)

D. Best practices
- Mainstreaming of openness and transparency as a core value in national policy documents, also in relation to research and innovation;
- Policy focus on higher openness of research via emphasising openness of research data. Ex., National strategy for making available and sharing research data77 and RCN’s policy for making research data available78;
- Development of infrastructure for open research data (ongoing project Norwegian Open Research Data Infrastructure (NORD-i));
- Experience with open data from public organizations (www.data.norge.no)

5.8.4 Responsiveness and adaptation

A. Description of the practice and its development and an assessment of how well it currently works

In general, it has been challenging to uncover this dimension in the analysis. However, this dimension is perhaps best seen in the “Long-term plan for research and higher education 2015-2024”. This report uses the term “flexibility” in relation to the research policy. It points out that research policy cannot be too “tight” as researchers need space to be able to quickly respond to new/local challenges and build further on latest scientific and technological discoveries. The white paper shows clear shifts towards prioritization of interdisciplinary and cross-cutting research strategies, and illustrate a transition towards

76 Ethical Guidelines for the Public Service (2005):

77 Nasjonal strategi for tilgjengeliggjøring og deling av forskningsdata:
https://www.regjeringen.no/contentassets/3a0ceee1c9b4611a1b86fc561abde7/no/pdf/f-4442-b-nasjonal-strategi.pdf, Accessed 11.06.18

78 https://www.forskningsradet.no/en/Article/Open_access_to_research_data/1240958527698
using the RCN in a proactive way to utilize resources and learning between disciplinary sectors in a more active way.

Responsiveness is also seen in the policy development procedures. Both the national strategy for biotechnology and nanotechnology were developed in consultation with a broad range of stakeholders and experts (see annex F). Moreover, biotechnology policy and decision making in general relies on input from a wide spectrum of experts and stakeholders, for instance seen in the Biotechnology Advisory Board and the Directorate of Health’s Reference group for issues related to biotechnology and biomedicine (see section 5.3 above).

Another unique example of responsiveness in national research and innovation policy was the Norwegian governments countermeasures when including the European Directive on the legal protection of biotechnological inventions (the Biotech Directive, 98/44/EC) into Norwegian law in 2004. This evoke concerns regarding patents on life and broader social and individual justice issues. There was broad political opposition to implementing this directive, and the result was that it was implemented with a number of countermeasures, intended to secure that no adverse societal effects should follow from this change, including restrictive interpretation of patentability and the establishment of a Norwegian Advisory Board on ethical aspects of patenting. It turned out that these countermeasures did not solve the problems they were intended to, but the attempt was in itself a good example of responsiveness to societal concerns related to science and technology.

B. Main barriers (structural, cultural or related to interchange dynamics)

Expectations of accountability may function as a barrier to including more responsiveness at the national policy level. There must be a predictability to policy, which means that policy documents cannot be too fluid and interpretatively flexible. A barrier towards responsiveness in the research system in general are the interests vested in particular framings of issues, governance mechanisms, etc. Another barrier is the highly technical nature of many issues, especially concerning emerging technologies, which leads key stakeholders to doubt the usefulness of the input of stakeholders outside the system, and thus lead to resistance to be adaptive to such input.

C. Main drivers (structural, cultural or related to interchange dynamics)

As indicated in the policy papers above, emerging science and technologies progress so rapidly that regulation and governance is lagging behind. This is acknowledged and is a main motivation for encouraging more ‘front-line responsiveness’, where researchers in the lab listen to societal concerns and adapt to them. An instrumental driver for such adaptation is the future market prospects. It is in no-one’s interest to develop technological solutions that will not be allowed or will be rejected by the market, and even delegitimise the whole research field (as arguably was the case with gene modification in the food sector).

D. Best practices

- The Norwegian Board of Technology has operationalized the responsiveness dimension via use of “feedback-loops”, mid-term evaluations and broad involvement of stakeholders in their projects.
- The policy development processes for the national strategies for nanotechnology and biotechnology.

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5.9 The integrated or fragmented nature of different responsibility related aspects

In Norway, there is no integrated RRI policy that covers the overall philosophy of RRI and the different RRI keys. Moreover, the different policy keys are mostly unrelated. Gender has its own policy context and legislation; research ethics likewise; and open access and open science yet another policy context and legislation. Open access and open science now has a common policy framework, even if policy documents on open access earlier did not refer to open science. Science education and public engagement may be said to be connected through both being linked to science communication. However, as shown above, there is not much explicit mention of public engagement in policy documents.

‘Responsibility in research and innovation’, in Norwegian, ‘ansvarlighet i forskning og innovasjon’, carries connotations to research integrity/ethics and the precautionary principle. In relation to research ethics/integrity it is about following good research conduct; following the rules for privacy, informed consent, proper research methods and communication of results, proper handling of research animals, etc. In relation to the precautionary principle it is about handling scientific uncertainties properly and transparently, about conducting sufficient research on side effects of technological innovations, and – potentially – delaying the technological implementation until enough knowledge about effects and side-effects are produced. ‘Ansvarlighet’ in Norwegian has less connotations to gender, open access, science education and public engagement.

The AIRR dimensions are often communicated together because the RCN includes them all in a common framework. Outside of this context, anticipation, reflexivity, inclusive deliberation and responsiveness is not used very much.

The importance of research integrity seems to have increased and a good example is the revision of the Act on Research Ethics. This is a trend in line with the increase in attention to integrity in the European Union. In Norway, the National Research Ethics Committees have been clear in the criticism of the relation between research integrity and research ethics. They believe that the legal focus on integrity (or rather; misconduct) takes attention away from research integrity in a more holistic, ethical perspective.\(^{80}\) While both research integrity and RRI has been on the rise over the last years, they have not been well connected, at least not in Norway.

Public engagement and RRI as a concept have been more connected, especially through the Board of Technology. As RRI can be viewed as a continuation of discussions in Technology Assessment (TA) (von Schomberg 2011),\(^{81}\) the methods of TA are generally useful in the RRI context, and TA, public engagement and RRI have been interchangeably advocated. However, RRI as TA has been conducted mostly outside of the research institutions themselves. In current initiatives like the Digital Life initiative of the RCN’s programme BIOTEK 2020\(^{82}\) or the SAMANSVAR programme, it is requested that the researchers themselves engage more directly with publics or stakeholders. However, organisations like the Board of Technology have also been involved in such projects, as experts in facilitation of deliberative processes. Also university specialist research communities take such roles in ‘integrated’ (i.e. thoroughly interdisciplinary or transdisciplinary) projects, indicating that there is still a certain outsourcing of public engagement from the natural scientist communities.

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\(^{80}\) [https://www.etikkom.no/Aktuelt/Nyheter/2015/5-rad-for-en-god-forskningsetikklov/](https://www.etikkom.no/Aktuelt/Nyheter/2015/5-rad-for-en-god-forskningsetikklov/)

\(^{81}\) Von Schomberg (2011) 'Prospects for Technology Assessment in a framework of responsible research and innovation' in: M. Dusseldorp and R. Beecroft (eds). Technikfolgen abschätzen lehren: Bildungspotenziale transdisziplinärer Methoden, Wiesbaden: Vs Verlag

\(^{82}\) [https://www.forskningsradet.no/prognett-biotek2021/Home_page/1253970728140](https://www.forskningsradet.no/prognett-biotek2021/Home_page/1253970728140)
Open science is currently receiving a lot of attention in Norwegian research policy. There is a working group on Open science in the Research Council; Open science was the topic for the 2018 Conference of the national association for research managers and administrators (NARMA); and in 2016 the former secretary of the Ministry of Education and Research, Bjørn Haugstad, called Norway a ‘cautious forerunner in Open science’\(^3\). There is a certain connection between Open science and public engagement, but the main connection is probably to the impact agenda (ibid). The Open science concept in Norway normally includes mostly open access and open data. It is not much related to other RRI keys or the AIRR dimensions.

\(^3\) [https://www.regjeringen.no/no/aktuelt/the-norwegian-approach-to-open-science-impact-and-evaluation/id2482412/](https://www.regjeringen.no/no/aktuelt/the-norwegian-approach-to-open-science-impact-and-evaluation/id2482412/)
6. Organizational reviews and outlooks: Research conducting organisation - OsloMet

6.1 Mapping of the organisation
Oslo Metropolitan University (OsloMet), until 12th of January 2018 Oslo and Akershus University College, is Norway’s newest university and the third largest institution of higher education. OsloMet has:

- 20,000 students
- 2,000 employees (of which appr. 1,300 academic staff)
- 52 bachelor programmes
- 33 master programmes
- 6 PhD programmes
- 4 Faculties and 4 Research centres (for the organizational chart see Annex E)
- 3 locations (main campus in Oslo centre).

OsloMet positions itself as a “different university” with a professionally oriented profile that through education, research and research communication aims to solve societal challenges and further promote the welfare society. In its Strategy 2024, OsloMet sets the goals concerning becoming a leading provider of research-based education and of introducing new technology, innovative solutions and efficient work methods. This underlines the focus and strength in delivering applied research. Another goal seeks to further professionalization of the organization and infrastructure. OsloMet also aims to further develop an international profile but at the same time stay relevant and make a contribution towards the development in the Norwegian and regional contexts.

OsloMet is the result of several mergers. In 1994, 13 independent university colleges merged into Oslo University College. Then in 2011 when Oslo University College and Akershus University College merged into Oslo and Akershus University College of applied Science (HiOA). Further, in 2014/2016, several independent contract research institutes joined OsloMet by establishing Centre for Welfare and Labour Research at HiOA. As a result of mergers, the university currently represents different organizational cultures. The university takes culture building seriously by introducing common values in the policy documents and raising awareness among employees.

Research at OsloMet is conducted in the research groups at the faculties and centres. A lot of research is project-based and is carried out as collaboration between researchers in different research groups and with external research environments.

6.2 Aspects of responsibility in organisational policy and practice
At the time being there no national guidelines for universities, higher education and research institutions concerning an RRI-policy framework. It is thus not reasonable to expect that Oslo Met at the moment should have an internal RRI-policy. In this section, we will review how the university’s current policies and practices relate to RRI so OsloMet may use this review as a guide to potentially proceed in facilitating further its RRI-practices.

This section reviews the RRI aspects studied in the RRI-Practice Project (including any concepts that may be used for addressing RRI related issues). Firstly, the notions of responsibility in research present in the organizational discourse are discussed. Then a review of OsloMet’s practice within RRI-keys and research process dimensions is provided. Each RRI-aspect is approached by:

- a short review of how a particular RRI-aspect is approached at OsloMet;
- a list of best practices researchers point out as worth sharing with other higher education and research institutions worldwide;
- a reflection on barriers and drivers for further development of the RRI-aspect at OsloMet;
suggestions for improvements of the practice and indicators to employ to measure progress.

6.2.1  The conceptualisations of responsibility science and innovation in the organisation
The term “responsibility” as such is not used in the main policy documents at OsloMet. However, the policy documents address different aspects of responsibility leaving room for interpretations. The budget allocation letter from the Ministry of Education and Research to HiOA that defines governmental priorities and expectations for the university, highlights such aspects of HiOA’s responsibility as a higher education institution as “high quality of research”, “science to address societal challenges”, “open research” and “new knowledge for value creation”\(^64\). OsloMet’s strategy 2024\(^85\) promotes many of the same aspects of responsibility accentuating “relevance”. In fact, OsloMet’s vision is “Delivering knowledge to solve society’s problems”. Other aspects of responsibility found in the strategy that are in line with RRI are “close cooperation with society”, “promote equality”, and “being open in our dealings with society”. OsloMet’s ethical guidelines\(^66\) point to global responsibility referring to a “responsibility to disseminate relevant knowledge to regions which would otherwise be excluded because of economic disparity”, as well as to contribute to counteracting global injustices and protecting biodiversity. The university’s Open Access policy underlines “free exchange of ideas in connection with the research”. The university’s Action plan for diversity 2017-2019\(^87\) promotes “diversity”, “equality” and “inclusion” as values while the OsloMet’s Communication policy\(^88\) promotes “openness”, “cooperation” and “dialogue”.

All in all, this shows that RRI thinking and practice is to some extent present in the university policy documents, but maybe not united under the umbrella of “responsibility” or “RRI” and is to a lesser degree translated into the context of research processes. This in turn results in diverse interpretations of responsibility among researchers.

All our informants could somehow relate to responsibility in research which is well reflected in the following quote: “I have never heard of RRI and what it is about, but I have thought I have to be a responsible researcher” (informant 8).

Understanding of responsibility in research seems to vary depending on the employees’ position, discipline and sense of belonging. Administrative staff in the central administration we have interview exhibited a higher sense of belonging to OsloMet as an organization and thus define responsibility in terms of OsloMet’s role as an influential societal actor. In this view, such interpretations as “societal relevance” (“samfunnsrelevans”), “sustainability” (“bærekraft”), value creation (“verdiskapning”), and “research impact” are relevant.

Some informants at institutes expressed their belonging to particular institutes or even research environments and thus talked about responsibility in terms of partnership, inclusion and mutual support for better outcomes of research and education.

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\(^66\) Ethical guidelines for research at Oslo and Akerhus University College of Applied Sciences, issued by rector on 09.10.2014: [https://tilsatt.hioa.no/documents/585743/53632647/Ethical+Guidelines+for+Research/ead56ba5-f2d2-4941-9bcd-c183ea77ee4d](https://tilsatt.hioa.no/documents/585743/53632647/Ethical+Guidelines+for+Research/ead56ba5-f2d2-4941-9bcd-c183ea77ee4d), accessed 13.01.18.


\(^88\) Kommunikasjonspolicy, HiOA sept. 2016: [https://tilsatt.hioa.no/en/communication-policy](https://tilsatt.hioa.no/en/communication-policy), accessed 17.01.18.
Other informants at institutes related responsibility to their belonging to a particular discipline and thus limited their understanding of responsibility to research ethics applied in their particular discipline, quality assurance procedures, integrity or fear of being prosecuted for ethical misconduct. Responsibility in research is also perceived as something that seems to be more natural for some disciplines, but much less relevant for others and thus evokes minimal concerns in some environments. Understanding of responsibility gets limited to being ethically correct and not “crossing the line”: “In my field, ethics is not any challenge. This is because in this field it is almost impossible to cross the line” (informant 6). In this sense, it seems to be easier to disclaim responsibility or to minimize its importance in some fields or disciplines.

As most academic staff at OsloMet teach students, they often project responsibility on education and what effect it has on students as future professionals serving as teachers, nurses, engineers, and so on. In this sense, responsibility in research concerns research communication through delivering research-based education programs, stimulation of critical thinking and facilitation of scientific literacy through professional education. “We introduce the big RRI-related questions to students in small doses during the whole study process” (informant 3).

6.2.2 Ethics in the organisation
In this section we will review OsloMets’ practice in ethics and see how it is in line with the RRI framework. Ethics in the RRI framework refer to “(1) research integrity: the prevention of unacceptable research and research practices; and (2) science and society: the ethical acceptability of scientific and technological developments.”

A. Description of the practice, its development
The rationale for research ethics at OsloMet is introduced as an obligation to carry out research in accordance with the defined legal framework for research in Norway, OsloMet’s research ethics guidelines and as a requirement of scientific integrity.

Research ethics is a topic that is to some degree addressed by both central administration and at faculty levels. The central research administration has developed guidelines for the university employees such as Ethical Guidelines for Research and Rules for dealing with individual cases related to professional fraud. Research ethics is reflected on in OsloMet’s guide for R&D projects and there is a Research Ethics Committee. Each faculty has research administration resources that can advise academics on such issues as privacy- and data protection as well as process allegations of scientific misconduct and authorship conflict.

Even though most of our interviewees related to responsibility in research in forms of ethics, few of them were aware of OsloMet’s approach to research ethics as well as available guidelines and resources. In fact, the HIOA’s HR Strategy 2016-2018 names this as a challenge and suggests an

90 Rules for research ethics, intranet-page for OsloMet’s employees https://tilsatt.hioa.no/regelverk-forskningsetikk, accessed 13.01.18.
91 Ethical guidelines for research at Oslo and Akerhus University College of Applied Sciences, issued by rector on 09.10.2014: https://tilsatt.hioa.no/documents/585743/53632647/Ethical+Guidelines+for+Research/ead56ba5-f2d2-4941-9bcd-c183ea77ec4d, accessed 13.01.18.
94 HIOA HR strategy 2016-2018: http://www.hioa.no/Mediabiblioteket/node_52/node_1507/HIOA-HR-Strategy. Accessed 30.01.18
improvement measure: “Ensure that all researchers and academic staff are familiar with the ethical standards and practices at HiOA. Find efficient channels of communication”.

OsloMet’s Ethical Guidelines for research highlight individual responsibility for research:

“The Deans/Head of Centre and the Head of Department will continuously follow up that regulations are observed. Each project manager is responsible for ensuring that research is conducted in compliance with good research practice and recognised academic and ethical principles in their respective disciplines and within the established framework. Supervisors have a particular responsibility for informing PhD candidates and students of the regulations for research ethics that apply in their respective disciplines. Project team members, students, and PhD candidates are personally responsible for familiarising themselves with issues concerning research ethics.”

This approach to ethics is based on trust that employees are familiar with research ethics guidelines, keep themselves updated and practice ethical research. In fact, the opening line in the Ethical guidelines for research at HiOA is “all research and scientific activities are based on trust”.

However, we found a great variation in how the academic staff understand ethical responsibility in research, which may result in different practice of research ethics. Here are examples of different interpretations of ethics in research:

- doing research based on personal ethics;
- be sure to secure data protection;
- not to plagiarize;
- doing research that resolves societal challenges.

The OsloMet’s policy document relate research ethics and research quality in somewhat confusing way. Ethical Guidelines for Research do not use the word “quality” but refer to “good scientific practice”. The OsloMet’s guide for R&D projects employs the term “quality” only in relation to data protection and data quality:

“The quality and integrity of the research data depends on whether the project team members receive adequate training and access to research data stored electronically.”

In fact, protection of privacy/ data plans/ data management is gaining more and more organizational attention as the consequences of misconduct are big. There are developed intranet-pages on the topic. There is also an internal email-channel for researchers and students in search for technical and juridical solutions in data management. Researchers and students can get assistance in developing risk assessments and data management plans both by email, telephone and in person meetings.

The general impression is that ethics as an area in research administration and research management has previously had little focus within the organisation. In 2017, several research environments had initiatives to discuss research ethics and particular aspects of it at workshops and seminars at research group and institute levels. For instance in its new strategy for 2018-2024, the Faculty of Health Sciences

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95 HiOA’s intranet-page on research ethics: https://tilsatt.OsloMet.no/en/research-ethics, Accessed 12.01.18
96 Ethical guidelines for research at Oslo and Akerhus University College of Applied Sciences, issued by rector on 09.10.2014: https://tilsatt.hioa.no/documents/585743/53632647/Ethical+Guidelines+ForResearch/ead56ba5-f2d2-4941-9bcd-c183ea77ec4d, Accessed 13.01.18
97 Project planning, intranet-page for OsloMet’s employees https://tilsatt.hioa.no/en/planning, Accessed 13.01.18
has set a goal to strengthen competence in research ethics at all levels\textsuperscript{98}. These top-down initiatives show both interest and need to develop further research ethics practice at OsloMet.

There are also several research groups conducting research on ethics at OsloMet. Researchers from the Research group on responsible innovation at the Work Research Institute initiated in 2017 a process leading to a Consensus statement guiding research conducting organisations in the work to strengthen integrity (Forsberg et al. 2018)\textsuperscript{99}. The work was carried out under the auspices of the European PRINTEGINER project and involved, among many others, the secretary of the Research Ethics committee at OsloMet and a representative of a union for researchers.

B. Main current drivers for ethics at OsloMet:

\begin{itemize}
    \item Governmental policies and the legal framework, including the Act relating to Universities and University Colleges, the Research Ethics Act and pertaining regulations, the Public Administration Act\textsuperscript{100}.
    \item The terms and conditions set out by external sources of funding, such as RCN and EU’s Horizon 2020.
    \item Guidelines\textsuperscript{101} developed by the Norwegian National Committees for Research Ethics: six guidelines\textsuperscript{102} that relate to how ethics can be exercised through good research practice.
    \item Newly acquired university status which has strengthened the perceived need for professionalization of research in the organization.
    \item Initiatives at research group and institute-levels to gain more knowledge and competence in different aspects of research ethics also serve as a driver.
\end{itemize}

C. Main current barriers for ethics at OsloMet:

\begin{itemize}
    \item Ethics in RRI interpretation (science for society) is to a lesser degree reflected in guidelines developed Norwegian National Committees for Research Ethics (except for NENT).
    \item Variation in how academic staff understand ethics in research which is legitimate as research ethics may differ in different research field. This however does not exclude some commonality and coherence on research ethics that OsloMet’s researchers should share.
    \item Little focus on ethics in both central administration and management at different levels.
    \item OsloMet’s approach to research ethics reflects to a little extent on the science and society aspect covered in the RRI-policy framework.
    \item Scarce administrative resources that can guide the academic staff in raising awareness and leading discussions on research ethics.
    \item Researchers’ potential resistance to additional “bureaucracy” in introducing RRI in general and setting rules of ethics in particular.
\end{itemize}

D. Best practices

\begin{itemize}
    \item Ethical Guidelines for research;
    \item Research Ethical Committee;
    \item Science Ombud;
    \item Formal procedures for dealing with individual cases related to scientific misconduct;
    \item A 10-credit course in Science and Technology for all students.
\end{itemize}

Further description of the best practices is given in Annex A.


\textsuperscript{99} \url{https://printeger.eu/the-bonn-printeger-statement/}, accessed 13.01.18.

\textsuperscript{100} Research ethics, intranet-page for OsloMet’s employees \url{https://tilsatt.OsloMet.no/en/research-ethics}, accessed 16.01.18.

\textsuperscript{101} Ethical guidelines for research, \url{https://www.etikkom.no/forskningsetiske-retningslinjer/}, accessed 12.01.18.

\textsuperscript{102} Ethical guidelines for research, \url{https://www.etikkom.no/forskningsetiske-retningslinjer/}, accessed 12.01.18.
E. **All points of improvement**
- revision of the OsloMet’s Guidelines for research ethics to incorporate science and society aspect of research ethics;
- research ethics as a part of management competence development program for OsloMet’s managers at different levels;
- systematic training in research ethics;
- raising awareness among academic staff by means of available e-learning courses in research ethics at [www.sikresiden.no](http://www.sikresiden.no) (On the Safe Side) – an internet-resource with user-friendly on-line training;
- develop a local internet/intranet resource with questions/answers on research ethics issues;
- more personnel resources to advice on and develop practice in ethics at OsloMet;
- expanding the mandate of the adviser in ethics in central research administration to be adviser on RRI.
- continue and expand participation in networks for interchange learning on ethics (e.g. workshops and training provided by the European Universities Association).

F. **Current indicators / suggestion for indicators for ethics at OsloMet**
There are no current indicators for ethics at OsloMet.

G. **Agreed points of improvement, with action plans and indicators for success**
All suggested points of improvement as well as potential indicators are taken into consideration and will be followed up by the adviser on ethics, and the central research management.

Action points and indicators for success are as follows:
- Updated Guidelines for research ethics that incorporates science and society aspect;
- More personnel resources devoted to promoting RRI.
- Research ethics is systematically offered as e-learning courses and a part of management competence development program;
- A local internet/intranet resource with questions/answers on research ethics issues;
- An e-learning course on research ethics is available for staff and is included as part of e.g. the management competence development program.

Suggestions for indicators for ethics at OsloMet:
- number of employees received training in research ethics;
- perception indicators measuring awareness of organizational work on research ethics and perceived ethical/unethical behaviour.

H. **Resulting matrix**
See Annex C.

6.2.3 **Societal engagement in research processes at OsloMet**
Societal engagement refers to engaging societal actors to work together during the whole research process in order to align its methods and outcomes to the values, needs and expectations of society, and by doing so to assure research processes that are collaborative and multi-actor.103

A. **Description of the practice and its development**
Societal engagement in research as a two-way communication between researchers and societal actors is not explicitly articulated in policy documents of OsloMet. We have not identified any tools that

accumulate practices of societal engagement in research at OsloMet. Thus, this type of practice is rather ad hoc making it challenging to describe the practice and results, but also to facilitate it.

OsloMet’s Communication policy highlights the importance of dialogue in science communication and encourages academic staff to participate in public arenas where OsloMet’s different stakeholders meet\textsuperscript{104}. An example is participation on national gatherings for political and science communication such as Arendalsuka\textsuperscript{105}. Dialogue may also take place in OsloMet’s own established forums, as for instance SAMSVAR-forums\textsuperscript{106} or more ad-hoc gatherings organised by the university, for instance in the case of launching of new research reports. These arenas however are to a lesser degree oriented towards the public in general even though, in many cases, information about the events is available at internet-pages of the university and participation is free of charge.

OsloMet also has focus on building relationships with different stakeholders. OsloMet has close cooperation with the work life in the region, especially the public sector for which it educates professionals, and endeavours to tie closer relations to innovation actors. By doing so it brings stakeholders closer to OsloMet’s key activities such as education and research, facilitating the transfer of research results to innovative products and services.

Societal engagement in research appears to be a practice under development at OsloMet. Some research environments have for many years practiced participatory action research methods involving stakeholders in the whole research process, many others are rather new to public engagement in research. Societal engagement activities is also an element in on-going EU-funded projects at OsloMet.

Within EU’s RRI-framework, societal engagement also concerns engaging the public in formulating research questions and designing research projects. This is a way to secure the relevance of research and make sure the research is aligned with societal values and expectations. In terms of involving society in developing research questions at OsloMet, there are quite different views among academic staff. On one hand, academic staff seem to reserve research question formulation to researchers:

“Personally I have not allowed others to influence my research questions. I come up with my own questions and research them. I am to some extent influenced by what is happening in the world. But if I get inspired by a newspaper article and decide to research further a particular theme, this is still my own responsibility what I chose to research” (informant 6).

On the other hand, the availability of research funding has a huge impact on what type of research questions arise and who is responsible and engaged in formulation. It might be industry seeking to gain a competitive advantage through research. It might be OsloMet internal initiatives to promote interdisciplinarity and the institution’s relevance for the local community and society. It might be the Research Council of Norway (RCN) and EU announcements that facilitate academic staff to develop more inclusive research design and secure societal engagement in all phases of the research process.

B. Best practices
- establishing meeting places with the private sector (ex. Start Up Village);
- engaging NGO representatives in research;
- establishing arenas for dialog between researchers, policy-makers and practitioners;
- cultivating inclusiveness as a value in the organizational culture;

\textsuperscript{104} Kommunikasjonspolicy, HiOA sept. 2016: https://tilsatt.hioa.no/en/communication-policy, accessed 17.01.18.
\textsuperscript{105} Arendalsuka is a week-long national annual event in mid-August. It has since 2012 been the largest political gathering in Norway. The event has a clear mission to strengthen the belief in political empowerment and democracy through an open debate and involvement: https://arendalsuka.no/1219, accessed 28.08.2018.
\textsuperscript{106} SAMSVAR is a regular forum at OsloMet gathering researchers, policymakers and practitioners to discuss welfare-related issues based on newest research at OsloMet.
• action research at the Work Research Institute (AFI).
Further description of the best practices is given in Annex A.

C. Main current drivers for societal engagement in research processes at OsloMet
• OsloMet’s Communication policy, which appeals for participation in public debate and dialogue with different stakeholders.
• EU requirements for research funding that promote RRI in general and public societal engagement in research in particular.
• Practicing inclusiveness in RRI-terms seems to be challenging in some research environments at OsloMet. At the same time, there is academic staff and research environments that practice inclusion to a large extent; academic staff and research environments that work globally and seek to contribute to development not only in local community but also exercise social engagement in relation to other countries. These individual researchers and research environments can provide both inspiration and tools for promoting more diverse and inclusive research, innovation and education.

D. Main current barriers for societal engagement in research processes at OsloMet
• Lack of normative and administrative structures that promote societal engagement
• Lack of incentives to promote public engagement in research leaving this aspect of responsibility to personal interest and personal engagement.
• Insufficient and fragmented competence in popularization of research, science communication and public engagement in research among academic staff and research administration.
• National policy documents do not highlight societal engagement in research processes (beyond science communication).

E. All points of improvement
• Provide training on societal engagement in research for academic and administrative staff.
• Establish a devoted office and staff to facilitate practice of societal engagement in research.
• Reward the researchers’ involvement in societal engagement activities.
• Highlight societal engagement in research in both R&D-policy and communication policy.
• Relate societal engagement in research processes to responsibility in research.
• Develop indicators that reflect aspects of societal engagement in research and innovation
• Develop tools to monitor practice of societal engagement in research at OsloMet.
• Search for advice and inspiration on societal engagement practices at other universities and other organizations such as NFR, science museums, NGOs etc.

F. Current indicators
Currently, there is neither any monitoring of practice, nor indicators for societal engagement in research processes at OsloMet.

G. Agreed points of improvement, with action plans and indicators for success
All suggested points of improvement as well as potential indicators are taken into consideration. Two concrete actions are already agreed with the department of Communication: to develop a web-based practical step-by-step procedure for researchers that would like to engage in increase interaction with societal groups and to develop a module in the existing training programme for researchers called Excellent research communication. These will developed in the autumn.

Suggested indicators for success:
• Societal engagement in research is explicitly articulated in policy documents;
• More researchers aware and practicing SE.

This can be measured as:
- Established administrative structures for SE (policy documents, dedicated staff, tools to monitor practices, etc.);
- Number of researchers involved in SE in relation to total number of researchers (changing of the ratio over time);
- Number of researchers rewarded for SE.
- Number of SE-activities (over time);
- Number of OsloMet employees attending training initiatives on SE;
- Number of people involved (by socio-demographic variables).

H. Resulting matrix
See Annex C.

6.2.4 Gender equality and diversity strategies in the organisation

Gender equality can be understood as a three-dimensional construct whereby gender equality is reached when (1) women and men are equally represented in all disciplines and at all hierarchical levels, (2) gendered barriers are abolished so that women and men can develop their potential equally, and (3) when the gender dimension is considered in all research and innovation activities. The construct of ‘gender equality’ (GE) in research and innovation may be expanded to ‘gender equality and diversity’ (GE&D) accentuating organizational efforts to promote equality, diversity and inclusion in terms of different socio-demographic characteristics (age, ethnicity, disability, race, etc.).

A. Description of the practice

Since 2014, OsloMet’s gender balance work is based on the so-called extended equality concept. This means that gender balance measures are thus incorporated into a broader scope of diversity measures which also include ethnicity and disabilities. OsloMet is rather advanced in terms of gender equality work and diversity strategies. OsloMet by its own example serves as a facilitator for promoting the extended equality concept in the Norwegian higher education and research sectors.

The diversity work at OsloMet follows a mainstream-approach that allows to incorporate diversity measures into organizational and management structures rather than having diversity work as a separate activity that is easy to deprioritize. By applying the mainstream approach to the diversity works, OsloMet shifts focus from minority groups and solely anti-discrimination measures to the majority and inclusion practices.

The current diversity action plan reflects the mainstream-approach to the diversity work and introduces objectives and actions on the organizational level in respect to recruitment, organizational culture and management, and on the faculty level in respect to research and education. What is particularly remarkable in the current diversity action plan at OsloMet is its focus on the faculty level. The objective is to intensify the diversity work on the faculty level and adjust it to particular challenges and needs of the faculties.

As for the status in the gender equality work, OsloMet as organization does statistically relatively well in terms of gender balance. Compared to other universities in Norway, OsloMet has leading positions when it comes to the proportion of women in professor/associate professor positions. In 2017, OsloMet as the only Norwegian higher education institution had over 60 percent of women in professor/associate professor positions (Feil! Fant ikke referansekilden.). In 2017, OsloMet as the only Norwegian higher education institution had over 60 percent of women in professor/associate professor positions (61,5 %).


However, at faculty and institute levels, the proportions reveal a clear gender imbalance in terms of the professional top positions. For instance, at the Faculty of Technology, Art and Design (TKD) women account for 40 percent of the academic staff at all levels from fellow students to professor and lecturer, while they constitute 34 (33.9) percent of the professors and lecturers. At the Faculty of Teacher Education and International Studies (LUI), men represent 31 (30.7) percent of the academic staff at all levels, while they account for 52 (51.6) percent of the professors and the lecturers. This indicates both a clear horizontal and a clear vertical gender imbalance which is a well-known international and Norwegian phenomenon (Vabø, Tømte and Gunnes 2016).

Some informants do not see gender misbalance as a problem, others are concerned with a lack of managerial interest in addressing the gender issue.

“*In our department, I have noticed, no-one seems to be interested in equality issues. It is not problematic. However, it may be an interesting observation that there is no particular “fight” for diversity. The job advertisement texts invite people with different backgrounds, that is it. No-one actually works to secure diversity and illuminate gender differences*” (informant 8).

In traditionally “masculine” and “feminine” disciplines, it is considered challenging to employ a best qualified representative of a minority gender giving lack of qualified candidates. Some departments work actively in raising a new generation of candidates of a minority gender by having recruitment campaigns among potential students of a minority gender.

The status concerning ethnicity and disability and the challenges these groups of employees or a diverse organization faces are less clearly defined, making it more challenging to plan for development.

109 A diverse university, a blogg post by prorector for research Morten Irgens, date 30.10.15, [https://blogg.OsloMet.no/mortenirgens/2015/10/30/a-diverse-university/?lang=en](https://blogg.OsloMet.no/mortenirgens/2015/10/30/a-diverse-university/?lang=en) Accessed 12.01.18
Recent organizational efforts in the area of diversity work has resulted in a number of practices worth spreading (more closely presented in section 4.4.2) to promote gender equality and diversity in higher education institutions. The existing practices are mostly on the organizational level and represent to a lesser extent practices for gender balance or diversity in research.

The gender and diversity key in relation to research and innovation is more vague in many senses. The current diversity action plan invites faculties to incorporate the diversity dimension more systematically in research and education processes. The practice however remains fragmented and its institutionalization is concerned with some challenged. For instance, it may be unclear for academic staff how to reflect on gender issues in research proposals in a more creative way than simply suggesting a female project manager or recruiting a female PhD-student. For others, thinking gender and diversity perspectives reflected in research may come more naturally. But they may lack knowledge and understanding of complexity and opportunities the diversity perspective comes with. Stimulating for multidisciplinary cooperation on campus may provide a good solution.

B. Best practices
- Building up organizational culture with diversity as a value;
- diversity action plan;
- dedicated personnel resources
- diversity Committee;
- diversity management training for management and other employees;
- own budget for diversity-related activities;
- diversity as topic in research and education;
- hosting the national conference on gender equality at higher education institutions.

Further description of the best practices is given in Annex A.

C. Main current drivers for diversity at OsloMet
- Funding organizations’ requirements to reflect on gender balance issues in proposals.
- The new Equality and Discrimination Act that has come into force on 01.01.2018 and replaced four previous anti-discrimination Acts for different discrimination grounds, Gender equality act included, will support and further guide OsloMet’s diversity efforts. The Act gives better support for OsloMet’s extended approach to diversity that goes beyond gender equality as it provides more uniform protection for all the grounds for discrimination. The Act obliges employers to work actively to promote equality and prevent discrimination when it comes to recruitment, salaries, promotion and growth opportunities, etc. (Lovvedtak 118, 2016-2017).
- The chosen mainstream-approach to the diversity work is advised by The equality and anti-discrimination ombudsman (LDO), a Norwegian ombudsman for gender equality and anti-discrimination and is based on findings and suggestions of the White papers issued by Equal Opportunities Committee in 2011 and 2012 (NOU 2012: 15 - Gender Equality / NOU 2011: 18 - Gender Equality Structure).
- OsloMet’s diversity work is also inspired by recommendations from the Norwegian Committee for Gender Balance and Diversity in Research (KIF). The KIF-committee provides support and recommendations on measures contributing to gender balance and diversity in the Norwegian research sector.
- At the organisational level, both OsloMet’s strategy, the action plan, dedicated personnel resources, the budget and educational programs to enhance comprehension of different diversity aspects among employees serve as important drivers. OsloMet also has a rector with an interest in gender equality issues in academia and leads the KIF committee.
- Diversity is both subject for teaching and research in different disciplines at OsloMet.
- OsloMet has developed trainings for employees on diversity issues.

D. Main current barriers for gender equality/diversity at OsloMet

- Little competence in diversity management among managers at different levels at OsloMet as well as barriers for them to prioritize and practice diversity management on a day-to-day basis.
- Little statistic and no review of diversity challenges at the level of faculties and centres.
- Little knowledge among researchers about how the gender/diversity dimension can be addressed in proposals to NFR and EU (over and above securing gender balance in the research group/appointing women as project managers).
- Limited administrative resources.
- No ear-marked budgets for diversity work at the level of faculties and centres.

E. All points of improvement

- Increase budget allocations for diversity work at the level of central administration and assure that there are ear-marked budgets for diversity work at the level of faculties and centres.
- Consider appointing diversity advisers at the faculty level.
- More internal research to identify and better understand OsloMet’s challenges in diversity work.
- Develop tools to monitor different aspects of diversity related challenges and results of diversity work at OsloMet.
- Develop and implement measures to increase proportions of women in male-dominated fields of science and men in women-dominated fields of science.
- Provide training activities on the inclusion of gender/diversity dimensions in the context of research and teaching.
- Get insights from universities abroad to develop or adopt:
  - training activities on the inclusion of gender/diversity dimensions in the context of research and teaching
  - tools to monitor different aspects of diversity
  - measures to increase proportions of women in male-dominated fields of science and men in women-dominated fields of science.
- Provide recommendations for developing further national policies for diversity work in academia.

F. Current indicators / suggestions for indicators gender equality/diversity

Currently used indicators concern only gender equality:

- % of women in top academic positions, in general and at the faculty level;
- % of women of all employees;
- % of women in academic positions;
- % of women in technical and administrative positions;
- % of women in different positions;
- % of women and men among students, in general and at the faculty level;
- women/men salary rate in different positions.

G. Agreed points of improvement, with action plans and indicators for success

All suggested points of improvement as well as potential indicators are taken into consideration and to be followed up by the adviser on diversity.

Aim of actions:

- Secured personnel and budget allocations for diversity work at faculties/centres.
- Increased awareness of diversity and need for more inclusive research practice.

Suggested indicators:
- Perception indicators (to be measured annually through questionnaires), for instance: awareness of the impact of stereotypes and unconscious bias on diversity in science; barriers for inclusion; understanding of the diversity dimension in research, etc.
- % of women/representatives of diversity in decision-making bodies, incl. advisory committees, expert groups, recruitment and promotion boards (annual evaluation);
- % of representatives of diversity (country of birth/migrant status, disability) in relation to different academic positions and fields of science (annual evaluation);
- % of men/women that are principal investigators on a project (annual evaluation);
- % of men/women that are first (corresponding) authors on research papers/publications (annual evaluation).
- % of research projects including gender/diversity analysis or considering gender/diversity dimensions (annual evaluation, out of total n. of projects).

H. Resulting matrix
See Annex C.

6.2.5 Open access and open science strategies in the organisation

Open access (OA) refers to “the practice of providing online access to scientific information that is free of charge to the end-user and reusable” (European Commission, 2017). EU’s Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020 distinguish between green and gold OA and we use the same terminology in this review. ‘Green’ open access, also referred to as “self-archiving”, implies archiving the published article or the final peer-reviewed manuscript in an online repository making it accessible at once or after an embargo period has elapsed. ‘Gold’ open access refers to immediate publishing in open access mode. OA is a part of open science movement which also include open research data. In this report we focus primarily on OA.

Given OsloMet’s outstanding effort in practice of this key, this section seeks to review the existing practice in greater detail in order to communicate OsloMet’s experiences as best practices worth spreading worldwide.

A. Description of the practice

OsloMet’s efforts and practices in OA are rather advanced in the context of Norwegian higher education institutions and internationally. In the national status report for a higher education sector 2017, OsloMet along with University of Tromsø, are praised for most OA-publications. The report acknowledges OsloMet’s long-term efforts in this area as a result of the effective follow-up of its internal OA-policy. As for the achievements in OA, OsloMet presents following results for 2016:

- 80 % of articles published in 2016 are placed in a repository to become accessible;
- Of these, 50 % are openly available in OsloMet’s OA-digital archive (ODA) and can also be accessed via the national OA-digital archive NORA;
- 23 % of published articles in 2016 are published directly in online Open Access journals.

OsloMet began with its first OA-related activities in 2005. OA-efforts have been driven by ideals of openness and accessibility of research around the world. In 2009 the first OA policy was developed. In 2010, OsloMet opened its own OA-digital archive and put in motion an incentive scheme to facilitate OA.

The internal OsloMet-discourse on OA has changed in line with the development of the organizational practice in this area. During the first years, the discourse mostly concerned additional administrative burden caused by mandatory self-archiving of publications, insecurities academics had in relation to openness in general and their contracts with journals in particular. Later on, the discourse has concerned the monopoly situation many journals have in respect to impact factors and acceptance in particular academic fields, academics’ freedom to choose where to publish, and academic publishing that promotes an academic career.

In 2017, as a result of the new contracts with EU and the EU funded projects, OsloMet’s focus within OA started to expand to include open data practices, barriers and opportunities that promote or hinder the practice. OsloMet is a pilot institution in the Norwegian Centre for Research Data (NSD)’s project Norwegian Open Research Data Infrastructure (NORDi). The project is to develop a new infrastructure that will make it easier to locate, use and share research data, in addition to providing courses, counselling and support. The infrastructure is due in 2021.

B. Best practices
- Open digital archive at OsloMet (ODA);
- OsloMet’s internal policy on OA;
- technical infrastructure for OA-journals at OsloMet;
- dedicated OA-research administration resources;
- OA-publication fund;
- focus on raising awareness;
- OsloMet’s internet pages on OA;
- Incentives.

Further description of the best practices is given in Annex A.

C. Main current drivers for OA at OsloMet
- National goals and guidelines for open access to research articles\(^\text{118}\) and the National strategy for access and sharing of research data\(^\text{119}\).
- The National developments in OA-areas has in many ways been inspired by the international movement for open access, EU’s policy in this area and the impact it had on both national and international research-funding organisations. In fact, OsloMet presents it as an argument for OA on the intranet: “Many funding agencies, including the Research Council of Norway, Horizon 2020, Welcome Trust, RCUK and DFID, require it as a condition for financing. Even if you are half-hearted to ideology, you must embrace it in reality\(^\text{120}\).”
- At the organisational level, today’s OA-practice is driven by a developed culture for self-archiving of the publications, a developed robust and well-functioning structure for advising on OA and archiving, as well as technical infrastructure and funding for publishing in OA sources.
- In earlier days of developing of OA-practice at OsloMet, the role of dedicated employees at research administration and their efforts for lobbying and developing a culture for OA was rather crucial. Another driver at the earlier stage of development (which is no longer applied) was use of incentives.

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\(^{118}\) [https://www.regjeringen.no/en/dokumenter/national-goals-and-guidelines-for-open-access-to-research-articles/id2567591/](https://www.regjeringen.no/en/dokumenter/national-goals-and-guidelines-for-open-access-to-research-articles/id2567591/) , Accessed 04.01.18

\(^{119}\) [https://www.regjeringen.no/no/dokumenter/nasjonal-strategi-for-tilgjengelighet-og-deling-av-forskningsdata/id2582412/](https://www.regjeringen.no/no/dokumenter/nasjonal-strategi-for-tilgjengelighet-og-deling-av-forskningsdata/id2582412/) Accessed 19.01.18

\(^{120}\) [https://tilsatt.hioa.no/en/why-choose-open-access](https://tilsatt.hioa.no/en/why-choose-open-access), Accessed 04.01.18
D. Main current barriers for OA at OsloMet
Being among the best in OA higher education institutions in Norway, OsloMet is in many ways satisfied with its own organizational practice.

- The main barrier for further developing gold OA-publishing is seen outside the organizational and national borders, namely in the academic publishing industry and the way evaluation panels in research-funding organizations rate applications based on where a scholar has previously published. In many fields, the “influential” journals are not OA journals. In order to improve their chances for receiving grants younger scholars especially thus aim at publishing in journals with the best reputation in their respective disciplines. So to promote further open access publishing may require a major cultural shift in both research-funding organisations (for instance, in a way evaluation panels evaluate researcher CVs and publication lists) and academic publishing industry.
- Researchers’ careers are still assessed based on high impact rather than OA publishing, also for internal promotion.
- Awareness of gold OA does not seem to be equally high in different disciplines and research environments.
- Our review shows that some environments are more conservative in regards to OA.

E. All points of improvement
Researchers’ suggestions based on interviews and overall analysis of the description of OA-practice at OsloMet:

- Develop internal OA/Open science long-term/short-term strategy with targets, activities and indicators.
- Revise internal OA/Open science policy to also include guidelines for gold OA.
- Keep raising awareness about open science among OsloMet’s employees by informing/reminding of existing policy, activities, etc. and taking the topic up in research groups by strengthening Cristin-superusers competence in OA and later on open data.
- Develop a set of internal indicators that help to reflect on the status and needs in OA field.
- Contribute to developing national guidelines for OA and open science.

F. Current indicators / suggestions on new indicators for OA
Current indicators in use are:

- percentage of articles deposited in Current Research Information System in Norway (Christin);
- percentage of articles published directly in online Open Access journals\(^{121}\).

Newly published National goals and guidelines for open access to research articles (2017) has however announced development of national indicators for OA as one of the goals. This may be guiding further development of OA-indicators at OsloMet.

G. Agreed points of improvement, with action plans and indicators for success
All suggested points of improvement as well as potential indicators are taken into consideration and to be followed up by the adviser on OA. The intention to extend the open access work into open science work has developed over time and is nowadays clear to be realised. It is seen as useful to promote open science and RRI in parallel. The process of the revision of the OA-policy into Open science and RRI policy has started.

Suggested indicators:

\(^{121}\)
The Open science policy is developed
XX % increase in reported awareness of OA policies & required practices in organisational surveys;
by 20XX, XX% of researchers will comply with OA requirements.
XX% increase in total annual allocation of funds to OA-publishing.

H. Resulting matrix
See Annex C.

6.2.6 Science education as integrated in research
OsloMet provides a wide range of educational services as a part of its educational mandate. This includes both research competence courses at PhD-level and continuing education programs. Development of pedagogical resources is a part of this profile. These educational activities are not under review in this section.

Here we will rather focus on science education activities that are somehow incorporated in research processes. We address two aspects of the science education RRI-key; science communication and RRI-education. Firstly, we are interested general science communication measures targeted at the wider population in order to increase their interest in and understanding of science. Such understanding is e.g. important for ensuring a will and ability for public engagement in science and innovation. Another aspect we review under science education umbrella is RRI education for scientists.

A. Description of the practice
Science education as defined in the RRI framework is not a formalised core activity for OsloMet. There is neither a formal strategy for science education as such, nor formal structures promoting this as a general practice composed of several areas of activities.

Related to science education, public communication in general and science communication in particular are emphasised strategies as they are grounded in OsloMet’s mission as a higher education institution. OsloMet uses public communication to promote the Central Government Communication Policy\(^{122}\) and as an instrument to achieve the strategic goals and create the university’s identity and public image.

In its strategy 2024, OsloMet sets the goal of being “a leading provider of research-based knowledge to the welfare society”\(^{123}\). Dissemination of research results and enabling “a greater number of academic staff to improve their capabilities as disseminators of knowledge” is one of the prioritized activities for the coming years. As one of the informants explained:

> It is about having an important role in the society by for instance, allowing the society to play a part in the existing research we conduct and assuring that research influences decisions politicians and other societal actors make. We interpret our societal responsibility to be to contribute that Norway and maybe even world will be a better society (Informant 13).

The strategy also highlights OsloMet’s ambitions about holding a high profile public debate on regional needs and challenges as well as promoting dissemination of knowledge about more specific issues, such as welfare technology.

As for the organizational structure for public and science communication, OsloMet has just under 50 communication advisers in both the central administration and at faculty/institute levels who in addition to other aspects of communication can assist with research communication and promote OsloMet


research through institute, faculty or university communication channels. There is also a network of communication advisers working with science communication which gathers every second week.

OsloMet has as a general rule that research “results must be published in both academic and popularised form”\textsuperscript{124}. Academic staff writes articles for newspapers and internet-resources, participate in debates on radio and TV, present their research in different organizations and conferences for practitioners, blog and share research on social media, etc. They also contribute to policy-making processes by commenting on sectoral policies. In addition to communication of research results, some academic staff is active in giving courses and public talks outside of campus as well as facilitating workshops in organizations, local communities and public gatherings. Science education activities are also a part of research projects conducted at OsloMet.

Research dissemination in a popularised form varies from institute to institute and is a stronger component at pure research institutes that operate largely on external funds. This also varies greatly at individual level depending on both personal interests of researchers to popularize research results, skills to do so and ability and willingness to allocate time to this activity. Some consider this responsibility as a part of their profession so they participate in debates, write chronicles in media, and publish textbooks and so on. Others are more focused on academic publications leaving the responsibility to communicate the research results with the broader society to OsloMet’s administrative staff or media.

In RRI, science education is also about ‘to ensure young people and adult learners are both motivated to learn and equipped to fully engage in scientific discussions and decisions and to facilitate further and deeper study’ and as such targets the educational system from pre-schools to adult education (see Science education for responsible citizenship, European Union 2015\textsuperscript{125}, p. 9). OsloMet does not have a specific strategy for communication of its research to teachers or schools, or promoting scientific understanding in the population, other than its regular professional teacher education program.

We have not identified any indicators in the field of science education. It is also challenging to gain an overview of all on-going science education activities as there is monitoring system in use. Thus our interpretation of the science education practice at OsloMet may have been limited.

OsloMet has RRI-research environments on campus which via their research contribute to promote science education as part of RRI in general, but also to RRI-education of scholars in Norway. OsloMet has started to develop a PhD course in ICT in which RRI may be an element. This course will be internationally available.

\textbf{B. Best practices}

- Program for outstanding research communication;
- participation in National Research Days;
- expertise centres based at OsloMet.

Further description of the best practices is given in Annex A.

\textbf{C. Main current drivers for science education at OsloMet}

- EU’s Science with and for society initiative.
- Science education components as integrated parts of externally financed projects.

\textsuperscript{124} Ethical guidelines for research at Oslo and Akerhus University College of Applied Sciences, issued by rector on 09.10.2014: https://tilsatt.hioa.no/documents/585743/53632647/Ethical+Guidelines+for+Research/ead56ba5-f2d2-4941-9bc6-c183ea77ec4d, accessed 13.01.18.

\textsuperscript{125} http://ec.europa.eu/research/swafs/pdf/pub_science_education/KI-NA-26-893-EN-N.pdf
- The Norwegian Law on Universities and Higher education institutions that obliges universities “to contribute to disseminating results from research” and “facilitate the institution's employees and students to participate in the community debate”\(^{126}\).
- The Government Communication Policy\(^{127}\) that accentuates “complicity” and «outreach» as main values in communication for employees of state-owned organizations.
- Market forces in contract research which put pressure on individual researchers and research environments to be seen and represented in the public debate and by doing so market their competence for future contracts.
- Individual researchers and research environments practicing science communication can provide both inspiration and tools for promoting science communication at OsloMet.
- The ambition to include RRI in PhD programs at the University.
- RRI-research environments at OsloMet as a resource.

D. Main current barriers for science education at OsloMet
- Science education is neither a prioritized, nor visible activity.
- There are no formal pressures at national or organizational levels.
- Science education in research processes (beyond science communication) is not a highlighted aspect of responsibility in research in any national policy documents.
- Lack of management focus on science education: Other more urgent issues and activities to prioritize.
- No incentives for academic staff to promote and implement science education activities.
- Limited funding of science education activities.
- No culture for science education or developed structures that may make it easier for more researchers to get engaged.
- At the managerial level, science communication seems to be referred to as personality-dependent, for those who have natural talent and engagement. This type of managerial thinking may serve as a barrier to promote science communication aspect as a being an important part of responsible research.
- Fragmented competence in science education.
- Competition among research organizations and individual researchers for media attention.

E. All points of improvement
- highlight and formalise science education as a core activity in strategic documents such as an action plan for research and development;
- consider developing incentives for staff involved in science education activities;
- consider appointing dedicated personnel and budget to facilitate science education practice in the organization.
- raising awareness among academic staff on both the science education component of research and RRI in general;
- develop monitoring tools and indicators to review science education activities at OsloMet;
- relate science education to responsibility in research;
- search for advice and inspiration on science education at other universities.

F. Current indicators / suggestions on new indicators for
There no current indicators on science education at OsloMet.

G. Agreed points of improvement, with action plans and indicators for success


Suggested points of improvement are taken into consideration by the university management. With regard to contributing to raising the understanding of science among young people and the population in general, it is unclear who will have the responsibility to follow-up the suggestions as there are no formal structures for such science education. This is probably the RRI aspect that has spurred the least interest at OsloMet; individual researchers find it hard to see how they in practice can contribute in the educational system. Moreover, promoting science in the school system is not seen as a specific responsibility of individual higher education institutions; rather, it requires policy making at the national level. Agreed points of improvement is therefore at the level of RRI teaching at OsloMet. Here it is agreed that the RRI-Practice OsloMet team will gather educational and reflection resources on RRI at a website for staff, as well as develop powerpoint-presentations and practical guides. A working group consisting of staff responsible for different internal educational programs has been established and will help disseminate this material.

Suggestions for monitor indicators:

- the existence of written policy on RRI;
- number of RRI education activities supplied by OsloMet;
- number of participants in RRI-training yearly.

H. Resulting matrix
See Annex C.

6.2.7 Incorporation of research process dimensions into organizational policies and practices

RRI may also be understood as consisting of dimensions or values that describe the research and innovation processes. According to this approach to RRI, the research and innovation process should be diverse and inclusive, anticipative and reflective, open and transparent as well as responsive and open to change. In RRI-practice we consider research process dimensions and RRI-keys as equally important.

General reflections on RRI-dimensions at OsloMet

Inclusiveness is already mostly covered by the societal engagement key above, and openness is partly covered by the open access key. Beyond these issues, it has been rather challenging to talk about the RRI research process dimensions at the organizational level at OsloMet. Firstly, because OsloMet as an organization operates with another set of values which in many ways only implicitly relate to these RRI process dimensions. Some values such as “diverse” and “open” have another meaning than the RRI dimensions. Some values are potentially conflicting with these dimensions (see below). Secondly, because not necessarily all publicly communicated values concern research processes. Thirdly, there is scarce documented evidence that gives insight into the values and their practice in research processes at OsloMet. Fourthly, given little unity about dominating research values the practice of AIRR-dimensions is very individual and diverse, making it impossible to generalize based on available data material. These arguments may as well be viewed as barriers to promote RRI dimensions in research process at the organizational level at OsloMet.
Here, we give an overview of values that guide research processes at the organizational level and relate those to RRI process dimensions. OsloMet’s main Strategy 2024 sets three core values guiding all organizational work. These values are to be fundamental for and to be reflected in other policy documents at the university, including research.

“Learning” as a value implicitly correlates with “inclusion” in research process dimensions. It appeals for closer cooperation with societal actors to make new knowledge produced at OsloMet more relevant. Interpretation of this value might be widened for it to promote RRI-values to a larger extent. This can be done by extending the focus on inclusion of societal actors in co-production of knowledge, but also by underlining that “learning” is an important and expected outcome of responsible research and innovation. “Learning” is also related to responsiveness, as the organisation and its staff must adapt to changes in the environment.

Interpretation of “innovative” as a value touches upon both „diverse and inclusive“, „open and transparent“ and to some extent “responsive” in the research process dimensions. By doing so this interpretation implicitly appeals for innovation to be responsible in RRI-terms. This is however not the intuitive interpretation of “innovative” as value and might be overseen by employees. Representation of this value might be strengthened in RRI-terms by introducing “responsibility” and linking it to the desirable outcomes of responsible research and innovation such as “solving societal challenges”, “socially desirable” and “engaged public”.

Interpretation of “diverse” as a value at OsloMet differs from the interpretation given in the RRI research process dimensions. At OsloMet “diverse” refers in many ways to “inclusive work environment”, “equality”, “anti-discrimination”, while RRI-research process dimensions refer to a larger degree to “diversity of perspectives”, “inclusion of different stakeholders in research processes”.

In addition to the core values introduced in the University’s Strategy 2024, it is relevant to bring up values introduced by the Ethical guidelines for research at Oslo Met. Given the nature and status of the document, the guidelines define explicitly the core values for the research process and researchers’ role in the process of research.
Beside the “openness” value which directly promote RRI-thinking (further discussed in the next section), the Ethical guidelines for research at Oslo Met introduce integrity, impartiality and independence as values. These values to a lesser degree coincide with the RRI process dimensions and are partly in conflict with those. Both “impartiality” and “independence” implicitly promote rather exclusive and closed research processes.

Even though the RRI-research process dimensions are not necessarily promoted in organizational policies and structures, this does not mean they are not practiced. What kind of values are practiced and how they are incorporated in the work culture in departments and research groups vary depending on research leadership and the values research group leaders and department leaders promote. Some departments have built up environments with inclusive (in a broad sense of the word) culture and collective spirit, while other are closed, rather individualistic and conservative.

Openness and transparency

Beside the main strategy, several other important policy documents such as the Communication policy, Open access policy and Ethical guidelines for research, highlight “openness” as a value. Of all officially defined values, interpretation of this value is most in line with the interpretation given in RRI-research process dimensions. Local interpretations of “openness” in different policy documents highlight slightly different aspects. The Ethical guidelines for research interpret “openness” as follows: “The researcher must make available research results to ensure verifiability and to give something back to the research subjects and to wider society”128. This statement addresses the need for transparency in research and visibility of research findings. The OsloMet’s communication policy highlights openness as a core value for all public organizations in Norway which implies for communication, including science communication, to be “open, clear and easily accessible”, while the Open access policy refers to openness in a sense of free access to research results.

Emphasis on this value at the university is a direct reflection of the democratic society and a number of governmental policy documents promoting this value such as The Norwegian law on universities and

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128 Ethical guidelines for research, [https://www.etikkom.no/forskningsetiske-retningslinjer/](https://www.etikkom.no/forskningsetiske-retningslinjer/), accessed 12.01.18.
higher education institutions\textsuperscript{129}, Ethical Guidelines for the Public Service\textsuperscript{130}, Central Government Communication Policy\textsuperscript{131}, National goals and guidelines for open access to research articles\textsuperscript{132} and other.

Most of our informants agreed with openness as a value which gives a sign that openness in well incorporated in the organizational culture at different levels. Several informants have also seen a direct link between openness and responsibility in research, as referred to in the following quote:

“\textit{This is related to transparency. If one is to be transparent, one must be able to stand for what one does and this leads quickly to reflections about responsibility}» (informant 1).

However, we also found that there are still some more conservative academic environments who do not work actively to practice this value. An unpublished survey conducted at OsloMet about research misconduct and integrity, under the auspices of the European PRINTEGER project, shows that 57 \% of the respondents report that they are guarded in their communication with each other out of concern that someone else will ‘steal’ their ideas (Forsberg et al., 2018)\textsuperscript{133}. Some research seems to be a “private” matter as it is implemented within “research time” that follows with a position and without external project financing. Thus research is being conducting for the researcher’s own interests rather than for society at large. This contrast in cultures may be due to a barrier that is common for all the RRI keys and dimensions, namely the presence of different organizational and research cultures due to several mergers that occurred and that have led to university status.

Best practices of “openness” are described in this report under paragraphs about “Societal engagement” and “Open access”.

See matrix in Annex C.

**Diverse and inclusive**

“Diverse and inclusive” is an important value at OsloMet. However, the university policy documents highlight slightly different aspects of “diverse and inclusive” than the RRI-process research dimensions do. They concern diversity in background among employees, non-discrimination and equality principles as well as developing an inclusive working environment for all employees. In the RRI-Tools framework, this dimension is quite similar to the gender and societal engagement keys. We therefore refer the reader to these sections of the report.

At the same time, inclusiveness in research has been an important topic in the interviews. We have therefore made an analysis of the organizational practice of this dimension. We have also suggested indicators for success and monitor indicators. These have not been discussed with the university management.

See matrix in Annex C.

\textsuperscript{129} The Norwegian law on universities and higher education institutions, \url{https://lovdata.no/dokument/NL/lov/2005-04-01-15#KAPITTEL_3}, accessed 16.01.18.

\textsuperscript{130} Ethical Guidelines for the Public Service, \url{https://www.regjeringen.no/en/dokumenter/Ethical-Guidelines-for-the-Public-Service-2/id88164/}, accessed 18.01.18.


\textsuperscript{132} National goals and guidelines for open access to research articles 2017, \url{https://www.regjeringen.no/en/dokumenter/national-goals-and-guidelines-for-open-access-to-research-articles/id2567591/}, accessed 18.01.18.

\textsuperscript{133} Forsberg, E-M., Mamelund S-E. and Breit, E. (2018) PRINTEGER survey: Resultater for OsloMet. Presentation at OsloMet 18.06.2018
Responsive and adaptive to change

Being relevant for society is one of the main ambitions at OsloMet. Many students get educational programs with strong ties to professional practice, and academic staff work primarily with applied and vocational research allowing adapting research and education to the needs of the stakeholders and society.

As a state-funded organization OsloMet has good conditions to both be responsive and adaptive to change, but also succeed with implementation of the RRI policy framework in general, as it intends to first of all benefit the society. Barriers are that researcher autonomy may limit will to adapt to external expectations. Moreover, incentives and academic career development may limit the will to respond to societal input.

We analyse the practice of this dimension in Table 8. We have also suggested indicators for success and monitor indicators. These have not been discussed with the university management.

See matrix in Annex C.

Anticipation and reflexivity

Reflecting critically on research outcomes seems be challenging. Traditionally the role of research and development is linked to its positive outcomes. It may require a change in perspective and introduction of new tools to facilitate anticipation, scenario thinking and reflecting on the possible negative consequences of research and innovation as well as to reflect on the societal desirability of research. This is to secure a transition from “science in society” to “science with and for society”.

We have analysed the practice of the dimension in Table 9. We have also suggested indicators for success and monitor indicators. These have not been discussed with the university management.

See matrix in Annex C.

6.3 Reflection on the review findings, outlooks developed and ways forward

In this section we provide a discussion on integration of various RRI-aspects in OsloMet’s organizational work. We also provide recommendations on possible incorporation and RRI-framework into organizational practice at OsloMet. We conclude with the plan for follow-up of this report based on internal discussions of the report’s findings and recommendations.

6.3.1 The integrated or fragmented nature of different responsibility related dimensions

OsloMet has developed and institutionalized practice on different RRI-aspects. The most advanced are open access, ethics and gender equality and to some extent societal engagement. This can be explained by emphasis put on these keys in governmental policies. The organizational work with different RRI-keys do not seem to be integrated under the umbrella of responsibility and is approached as separate fields of work. As for RRI-research process dimension, both diversity and openness are core values at OsloMet which make it more natural to incorporate these values also into guiding the research process. The other dimensions are not systematically integrated into any policy. In general, we have not found any systematic connection in the practice of RRI-keys and no explicit connection between the RRI-research process dimensions.

In fact, “responsibility in research” is not a widely used term even though both the university’s policy documents and academic staff refer to different aspects of responsibility in terms of “societal responsibility”, “value creation”, “ethics”, “relevance”, “quality”, “dialogue”, osv. As one of the informants put it «RRI is a bit everywhere» pointing to the presence of the responsibility discourse and practice, but at the same time underlining a diffuse notion of responsibility and RRI-related aspects and their integration in a more integrated framework.
The notion of responsibility at OsloMet mostly concerns responsibility in education and research, but not yet innovation, as this mission of the university, and this function of the research departments, is at the moment under development.

Except for a few research environments, RRI is an unfamiliar framework among OsloMet staff. As one informant put it: “The [RRI]-agenda has just fallen on us» (informant 5). The framework awakes interest and curiosity, but on the other hand, scepticism and fear of more bureaucratic burden.

The need for developing further RRI-thinking seems to be relevant for different organizational practices concerning research, education and research administration such as:

- administration for research and innovation;
- leadership for research and innovation;
- financial management for research and innovation;
- application for research funds;
- development of PhD-programmes;
- management of research projects;
- dissemination of research results,
- designing study programs;
- performing the role as an important societal actor and developing further the organizational image.

To develop further the RRI-thinking at OsloMet, there is need to discuss if RRI as a framework could be used as an instrument in further organisational development and professionalization of the university and if so secure argumentation for “why RRI?” at OsloMet. Further it is crucial to develop some common understanding of:

- how RRI may guide in developing further values for good research practice and thus promote a culture for responsible research?
- what RRI is for OsloMet?
- who is RRI for: Is RRI most relevant for some disciplines or can it be relevant in different fields of research and spheres of research and research administration?
- how RRI may unite rather separated areas of work such as ethics, open access and diversity and other keys?
- how RRI may strengthen the university’s work within public engagement and science education?
- how to implement RRI at OSLOMET in an effective way that does not add up more bureaucracy?

The existing Ethical guidelines (last updated in 2014) will benefit from reflecting on RRI-research process dimensions and translating OsloMet’s core values in Strategy 2024 into a concept of research process. The same will be relevant for a potential R&I Strategy. Thinking in terms of the RRI-research process dimensions may be seen as a step to modernize ethical guidelines and making them more relevant for researchers applying for external funding.

6.3.2 Common barriers and drivers for RRI

This section summons common barriers and drivers for RRI as a policy framework which is important to consider if OsloMet decides on employing this framework to enable further professionalization of research and innovation.

6.3.3 Potential barriers for implementing RRI-framework at OsloMet

Organizational legacy

OsloMet is an organization which came together as a result of many merges. The university still faces challenges in functioning as one organization with one dominating organizational culture and respect for and understanding of recently developed governance structures. Decentralization of faculties and the
existing model of budget allocation may also be a barrier as it may limit the organizational capacity to pursue centrally developed strategies and priorities. At the same time, external demands push OsloMet to mobilize resources and build on capabilities different faculties and institutes have. This can be used by management and administration to further develop a more open and inclusive organizational culture—a fundament for RRI.

**Scepticism to RRI – one more fashionable term/governance tool?**

Even though most of our informants could not neglect the need for responsible research practices, many have pointed out scepticism towards introducing RRI as a framework for OsloMet. Such scepticism is associated with additional governance as such a managerial tool that may increase bureaucracy in the organization. Some of our informants familiar with RRI also expressed scepticism to RRI as a policy framework. Is it there to last or is it just a transition point from ELSA134 to something else? Is it a fashion trend that will soon pass out of sight?

**Fragmented research/research management competence**

OsloMet is a higher education institution. Many academic staff have teaching positions with little or no time allocated to research. Many of the teaching staff do not have research competence either. The need to develop research competence further, especially within particular disciplines, may well serve as an opportunity to introduce RRI-thinking into developing research environments.

**Market logics**

The academic staff finds themselves under increasing pressure to attract both internal and external funding to conduct and communicate research. An increasingly strong market logic seems to create disparity and strengthen internal competition. This may cultivate a distinctive culture of exclusion if not addressed from the RRI perspective. Another dilemma concerns pressures to constantly be involved in acquiring funding which takes resources away from research quality and communication and as a result responsibility aspects that come with it. This may especially concern funding from private sources. On the other hand, research funders are becoming ever more demanding with respect to ethics requirements, data protection, societal engagement etc. and thus promote RRI-uptake in research environments.

**No normative interpretation of RRI**

The understanding of RRI in the organization is quite limited. At the time being, there is no normative base for developing a common understanding of RRI throughout the organization, reflecting on why RRI is important and how employees are expected to integrate RRI thinking into their work. At the same time, OsloMet has research environments that are RRI-experts and can be invited to both facilitate the discussions and develop the normative base for RRI at the organizational level. These environments may come with reflections on RRI that might be useful to take further into developing a normative understanding of RRI at OsloMet: How do the RRI keys and process dimensions relate to each other? Should the RRI keys be one area of research administration or five independent and non-overlapping key functions?

**Lack of national guidelines on RRI**

We see that in those areas of RRI work with solid legal base, clear governmental guidelines and well communicated values such as in open access and gender equality, OsloMet has an advanced practice. OsloMet as a government body prioritizes meeting requirements of the government. Given lack of

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134 ELSA stands for Ethical, Legal and Social Aspects of new technologies.
national guidelines promoting a broad RRI framework, it might be challenging to prioritize the organizational development based on the organisation’s own initiative.

6.3.4 Potential drivers for implementing an RRI framework

Gaining university status

“This is an opportunity. It is all changing now and the structures are not finally established yet. In an organisation which is changing and reorganizing, we should keep in mind that there is greater opportunity to incorporate this kind of propositions” (Informant 1).

Recent organizational developments have brought a new competence to OsloMet. Gaining the university status accredited to OsloMet in 2018 has mobilized resources for further organizational development. The idea is to become a “different university”. Gaining university status may provide an opportunity to incorporate RRI thinking as a distinctive feature of a renewed OsloMet and a “different university”.

Mission to educate

Being a higher education institution, OsloMet’s most important mission is to educate by sharing knowledge that aims to solve societal challenges. To secure high quality of study programs OsloMet will pursue research-based education, advance educational methods, focus on digital and technological competence, and increase awareness of the role of research and the importance of critical thinking (OsloMet strategy 2024). Linking an RRI framework to performance of the educational mission of OsloMet may secure RRI relevance for the larger part of the academic staff.

Mobilization for participation in Horizon 2020 and building up “centers of excellence”

OsloMet has developed infrastructure and competence to support research environments in developing research applications to EU programmes and larger applications to RCN, as for instance those that seek financing for developing centers of excellence. This infrastructure may be used as a learning platform also in relation to RRI as RRI thinking is expected to be mirrored in all applications to EU and many applications to NFR.

Emphasis on leadership competence

OsloMet has in recent years recruited management and administration staff not only from outside of the university college, but also from outside academia. This has created a positive dynamic of new thinking and new initiatives. OsloMet has also developed several arenas for development of internal leadership competence. These are arenas that may serve as a structure for discussing, developing and disseminating RRI-thinking within the organization.

Focus on internationalization

The current focus on increased internationalization of OsloMet may serve as an important driver for RRI implementation. Facilitating internationalization both in the field of study programmes, attracting international students and faculty staff as well as international research funding may provide favourable conditions for developing further an inclusive culture and may serve as an argument for developing a normative understanding of RRI and further operationalization of an RRI framework.

Facilitation a culture of sharing

Some environments work consciously and strategically to develop an organizational culture of sharing. They focus on values such as cooperation, mutual learning, knowledge sharing, inclusion, and group results. In these environments, RRI thinking and RRI practices seem to be more advanced. They seem to provide conditions for implementation of an RRI framework also on the cognitive level. These
environments, their managerial and organizational practices and undoubtful focus on importance of culture of sharing is worth emphasis and diffusion.

6.4 Final reflections and plan for follow-up

6.4.1 Possible areas of focus and future RRI-related activities

This section introduces the researchers’ suggestions for strengthening of RRI-activities at OsloMet.

For RRI as an overarching conceptual framework:

- decide on employing an RRI-framework as an instrument to further professionalize research and innovation at the university;
- develop such a prospective internal RRI-framework using a bottom-up approach to secure its integration in organizational work and culture.
- consider and decide on introducing indicators to help monitor progress along different RRI-keys;
- follow-up of aspects of improvement concerning separate keys;
- consider involving RRI-researchers on campus when developing policies for RRI-keys and internal RRI-framework;
- alternatively, initiate discussions on campus on what it means to be responsible in research and innovation at OsloMet;
- develop a plan for follow-up of this report and consider introducing a routine for yearly monitoring of the university’s RRI-practice by using the structure presented in this report.

For RRI-keys in general:

- Consider and decide on introducing indicators to help monitor progress along different RRI-keys as suggested in the chapter 5 of the report.

For RRI-Dimensions:

- We suggest to incorporate RRI-dimensions in the new plan for research at OsloMet.

For ethics:

- revision of the OsloMets Guidelines for research ethics to incorporates science and society aspect of research ethics;
- research ethics as a part of management competence development program (lederutvikling) for OsloMets managers at different levels;
- systematic training in research ethics;
- raising awareness among academic staff by means of available e-learning courses in research ethics at Sikresiden.no (On the Safe Side) – an internet-resource with user-friendly on-line training;
- develop a local internet/intranet resource with questions/answers on research ethics issues;
- more personnel resources to advice on and develop practice in ethics at OsloMet;
- expanding mandate of the adviser in ethics in central research administration to the adviser on RRI.

For gender balance/diversity:

- Increase budget allocations for diversity work at the level of central administration and assure there are ear-marked budgets for diversity work at the level of faculties and centers.
- Consider appointing diversity advisers at the faculty level.
- More internal research to identify and better understand OsloMet’s challenges in diversity work.
- Develop tools to monitor different aspects of diversity related challenges and results of diversity work at OsloMet.
- Develop and implement measures to increase proportions of women in male-dominated fields of science and men in women-dominated fields of science.
- Provide training activities on the inclusion of gender/diversity dimensions in the context of research and teaching.
• Get insights from universities abroad to develop or adopt:
  - training activities on the inclusion of gender/diversity dimensions in the context of research and teaching
  - tools to monitor different aspects of diversity
  - measures to increase proportions of women in male-dominated fields of science and men in women-dominated fields of science.
• Provide recommendations for developing further national policies for diversity work in academia.

For OA:
• Develop internal OA/Open science long-term/short-term strategy with targets, activities and indicators.
• Revise internal OA/Open science policy to also include guidelines for gold OA.
• Keep raising awareness about open science among OsloMet’s employees by informing/reminding of existing policy, activities, etc. and taking the topic up in research groups by strengthening Cristin-superusers competence in OA and later on open data.
• Develop a set of internal indicators that help to reflect on the status and needs in OA field.
• Contribute to developing national guidelines for OA and open science.

For societal engagement:
• Provide training on societal engagement in research for academic and administrative staff.
• Establishing a devoted office and staff to facilitate practice of societal engagement in research.
• Rewarding the researchers’ involvement in societal engagement activities.
• Highlight societal engagement in research in both FoU-policy and communication policy.
• Relate societal engagement in research processes to responsibility in research.
• Search for advice and inspiration on PE practices at other universities and other organizations such as NFR, science museums, NGOs etc.

For science education:
• highlight and formalise science education as a core activity in strategic documents such as an action plan for research and development;
• consider developing incentives for staff involved in science education activities;
• consider appointing dedicated personnel and budget to facilitate science education practice in the organization.
• raise awareness among academic staff on both the science education component of research and RRI in general;
• relate science education to responsibility in research;
• search for advice and inspiration on SE at other universities.

Informants’ suggestions for facilitation of RRI practices at OsloMet

In addition to the researchers’ suggestions, we gathered suggestions proposed by OsloMet’s employees on how to facilitate RRI-thinking at OsloMet. These are especially valuable if OsloMet decides on developing an internal RRI-framework.
• Communicate the importance of responsibility/RRI in strategies and policy documents at central and faculty/institute levels.
• Make normative documents inspirational and relevant for the staff so they will be followed.
• Develop a RRI reflection tool for the research process at OsloMet
• Introduce «resource groups» for facilitation of RRI thinking at OsloMet.
Motivate institutes and research group to experiment with RRI practices to encourage creative practical solutions adjusted to the organizational context and diverse organizational cultures.

Delegate responsibility for RRI thinking to individuals: “They must feel that it concerns them. As natural scientists or social scientists or institutions; they must feel that ‘this is my problem’ […] So there must be ownership to the issues, otherwise one makes no progress” (informant 1)

Develop a PhD-programme based on RRI-thinking.

6.4.2 Outlook

The list of researchers’ recommendations presented in section 6.4.1 was reviewed in the R&D Committee and the Research Administration Board (FAL) at OsloMet. The R&D Committee welcomed the recommendations at the meeting 14.06.2018.

There has been developed Policy and Action Plan for Responsible Research and Innovation (RRI) at OsloMet. The document has been adopted in the R&D Committee led by the vice rector for research at the meeting 14.06.2018. The Policy and Action Plan for RRI at OsloMet suggests to utilize RRI as a unifying concept in further focus on quality in research and innovation at the university. The RRI concept is suggested to be used as a learning and development tool to establish a common research culture at the university, raise competence for academic staff, and make them more competitive in gaining EU- and RCN-funding, further develop research ethics and open science, develop the university’s efforts in dialogue with the public and strengthen the university’s work with and contributions to innovation and innovative products and services. It is suggested to develop a joint RRI and Open science policy.

It has been developed an action plan (in Norwegian) with the following objectives:

- The policy for open science and RRI is communicated at the university.
- RRI-research dimensions are accentuated in the university’s policy documents such as action plan for research and action plan for strategy implementation, etc.
- Intranet web-pages with information and tools to foster openness and responsibility in research and innovation are launched.
- RRI becomes an element in internal training and competence raising programmes for OsloMet employees such as diversity management, R&D basic 2.0 for employees in research administration, e-learning, research group leadership and other relevant training programmes in OsloMet-academy.
- RRI becomes a formal responsibility of an adviser in the R&D administration.
- Plan for workshop design to engage researcher in reflections on RRI is developed and used in research groups at the university.
- Societal engagement and science education becomes a responsibility area of the Communication department which assigns it to dedicated personnel resources.
- Work on the ethics-key gets supported by additional personnel resources.
- Diversity work is strengthened.

In addition, a working group to develop RRI-training at different levels for OsloMet employees and students has been established.

One of the review findings concerned lack of formal acknowledgement and formal structures for societal engagement. To secure that this element of RRI gets strengthened the researchers suggested that the Communication department at OsloMet takes societal engagement as their formal responsibility.
7. Organizational reviews and outlooks: Research funding organisation
– The Research Council of Norway (RCN)

7.1 Mapping of the organisation

The Research Council of Norway (RCN) was established in 1993 and has approximately 460 employees. When describing RCN it is important to bear in mind that RCN as an organization and its activities must be seen as inherently intertwined with its surroundings within politics, government, the universities and research and innovation performing organizations in the public and the private sector. In terms of RRI it is therefore necessary to present not only activities and approaches to RRI within RCN, but also networks and collaborative activities with external partners and organizations.

Furthermore, in May 2018 RCN changed the structure, so no organizational map exists any longer for the Division for Innovation as it was when the RRI-Practice researcher was doing field work there. At that time, RCN was organized into four research divisions (Division for Science, Division for Energy, Resources and the Environment, Division for Society and Health and Division for Innovation) and one division for administrative affairs and an executive staff organized directly under the Chief Executive. The Research Council has some 460 employees.

The Division for Science used to be responsible for strategic development of the universities, university colleges and independent research institutes and for thematically and strategically-oriented basic research programs in selected fields. The division awarded funding in its open competitive arenas using scientific merit as the primary criterion (independent of considerations relating to politically-established priority areas), for instance funding Centres of Excellence (SFF). The Division for Energy, Resources and the Environment was responsible for research and innovation targeting national and global challenges associated with the energy, petroleum, climate, polar, environmental, marine and land-based resources sectors. This division’s key objective was to help to achieve effective, sustainable exploitation of Norwegian resources in order to boost growth in Norwegian industry, including both basic research, user-driven projects, innovation projects and technology demonstrations. The Division for Society and Health was responsible for promoting research and innovation targeted towards meeting global and national societal challenges related to health, welfare, education, social organization and innovation in the public sector.

The Division for Innovation was the key strategic actor in the effort to realize the Government’s plan for innovation policy and was responsible for mobilizing and funding research within and for the Norwegian business sector. The division analysed and developed strategies for research-driven innovation in industry-related thematic areas and for the innovation system as a whole. Its activities extended from direct support to individual companies, research institutes, universities and university colleges, to support for commercialization of research findings, network building and the establishment of specialized centres.

An important department in terms of RRI in the Division of Innovation was The Department for Enabling Technologies which promoted the use of enabling technologies (ICT, biotechnology and nanotechnology) in the Norwegian business sector and society at large as a means of generating new opportunities for research-based value creation in response to the Grand Challenges of tomorrow. It assumed that enabling technologies must be deployed in an industrial context to lay the foundation for the development of a sustainable business sector in Norway. The department administered the initiative on ICT research (IKTPLUSS), the large-scale program on Biotechnology for Innovation (BIOTEK2021) and the program on Nanotechnology and Advanced Materials (NANO2021). The department also included the National Contact Points for the corresponding segments of the Horizon 2020 European research framework program. The framework for RRI was an integral part of the department’s activities.
Another important department in terms of RRI in The Division of Innovation was The Department for Challenge-driven Innovation. This department focused on interdisciplinary approaches in its efforts to promote future-oriented, research-based innovation as well as knowledge-building in research institutions and companies. Among the department’s priorities were green industrial growth, restructuring in a broad perspective and responsible research and innovation, and it consisted of five teams for transport, maritime sector, green industrial development, health innovation and social responsibility. The program on Responsible Innovation and Corporate Social Responsibility (SAMANSVAR) was one of the programs administered by the department.

The current organizational changes are the results of a report from the so-called Productivity Commission that pointed out that the Council would be able to run efficiently on 10 % less operational funding. As a follow-up of the Productivity Commission, another commission investigated more thoroughly how quality could be increased and efficiency gains could be realised, claiming that ‘There should be even higher demands for scientific quality than today’ (p. 6). This commission, which submitted its recommendations in February 2017, recommended that there should be increased focus on excellence, at the potential cost of research for societal challenges. In addition, a need was identified for overcoming what seems to be a sectoral/silo-thinking within the Council, which has persisted from the merger of the five independent research councils into the RCN in 1993, and is supported by earmarked funding from independent ministries. Together, this is supposed to lead to a ‘rationalisation’ of the programmes, programme boards and procedures for grant applications, where there will be more standardised grant procedures, fewer programme boards and fewer deadlines, so that application procedures with be streamlined and a portfolio management approach will be applied to the whole of the RCN’s funding activities. This means that a proposal will be submitted independently of particular programmes; it is then evaluated by expert reviewers, and then by panels who assess how well it fits the different RCN budget purposes, i.e. the programmes. According to the Chief Executive of the RCN, this allows the Research Council to act as one council, and not as a ‘hotel for research programs’ (ibid.).

The Productivity Commission and its outcomes point back to two important former evaluations of the RCN. The first was conducted by Technopolis in 2001 (evaluation led by Erik Arnold, Stefan Kuhlmann and Barend van der Meulen). The evaluation was quite critical. Some recommendations from this evaluation were: ‘RCN should champion and initiate an open Foresight process, inviting a wider than normal debate about priorities and empowering more parts of society in relation to the national research agenda’, ‘Stronger co-ordination measures, involving the use of ‘horizontal’ budgets are needed in order to break down internal barriers’, ‘Evaluation should be more centralised and better coupled to learning in RCN and the organisations evaluated’, ‘Unnecessary process diversity should be reduced, increasing both efficiency and transparency’, and ‘RCN should use its increased budgetary freedom to establish itself as an arena for policy initiatives, and not solely as a planner’ (Technopolis 2001, pages 119 -120).

135 http://produktivitetskommisjonen.no/
136 https://www.forskningsradet.no/servlet/Satellite?cid=1254024827424&pagename= VedleggPointer&target=_blank
137 https://www.forskningsradet.no/no/Nyheter/Ekspertgruppens_rapport_Kvalitet_i_forskningen_er_et_hovedanliggende_for_Forskningsradet/1254024823068/p1174467583739
138 http://fpol.no/omorganisering/
It was again evaluated by Technopolis in 2011-2012, including many experts from the 2001 panel and led by Erik Arnold and Bea Mahieu. The overall conclusion was that: ‘RCN now performs well and is likely to continue to do so provided a balance can be maintained between the individual interests of the ministries and the collective interest, represented by a continuing balance between sectoral and strategic money.’ (p. 10). It still notes: ‘The need for a strong knowledge base combined with continuous restructuring and renewal means that the research and innovation funding system has to play two roles. One is as an ‘aggregation machine’, sorting out the best projects to fund and reflecting existing needs, not least as the ministries express them on behalf of their sectors of society. The other is as a ‘change agent’, supporting the process of renewal by encouraging change and innovation in science and industry. That is a difficult job. An organisation like RCN has to be orderly and disruptive at the same time.’ (p. 11).

The current organisational chart is slightly different from the former:

The main RRI protagonists in the RCN are now employed in ‘Business and technology’ and there are no departments for enabling technologies or challenge driven innovation. Another change in ‘RCN 3.0’ is a dramatic reduction in programme boards and external board members. In the old model there were more than 65 funding arenas, mostly with their own programme boards, involving approximately 750 external board members (ibid.). In the new model, programmes such as BIOTEK 2021 and NANO 2021 will not have their own boards. The intention is to strengthen the capacity for the RCN to function as a ‘change agent’ (ref. evaluation). The downside is that there is less participation from the research communities in the field specific priorities of the Council. Moreover, with the disappearance of the programme boards for BIOTEK 2021 and NANO 2021, an important platform for interdisciplinary deliberation will be lost.

7.2 Aspects of responsibility in organisational policy and practice

7.2.1 The conceptualisations of responsible research and innovation in RCN

RCN’s main strategy has the title “Research for innovation and sustainability – Strategy for the Research Council of Norway 2015-2020”. In this document it is explicitly stated that earlier strategies for the RCN have understood its role primarily as an extension of a notion of research as a goal in itself rather than a notion of research as responsible or as a responsibility. While reassuring that the RCN is responsible for providing for research being done on its own terms and as a goal in itself, it is also stressed that societal challenges to a greater extent must be put on the agenda of research because research and innovation increasingly is becoming part of the solutions to the challenges our society is facing. The main strategy for RCN towards 2020 thus clearly reflects RCN’s appropriation of its role as a social actor of change and the Council’s broader social responsibility. Even if, as some of the interviewees in RCN argued, research should not just be understood as part of the solution, but also as part of the problem in connection with the societal challenges we are facing, the strategy’s way of stressing its responsibility as a social agent is significant. In this way the main strategy functions as an overriding or general driver for RRI in RCN, a point of reference for the development of the RRI-agenda in the organization.

In chapter 5 we outlined earlier conceptualisations of responsibility in research and innovation in the RCN, related to national strategy documents. We also refer to Annex F for further details. Here, we will focus on RCN’s AIRR approach and the way they see this in terms of learning, and we will suggest barriers and drivers for further development of this approach.

7.2.2 RRI as an open process of learning

Approaches to and practices pertaining to RRI in RCN is a question of discursive developments both within the organization and outside, both nationally and internationally. Furthermore, many of the RRI-related activities in RCN unfold as collaborative activities and network activities together with actors outside of the organization. RRI in RCN is thus characterized by important interchanges. It builds on insights and approaches both from programs like ELSA and collaboration and inspirations from organizations like OECD, especially the Working group on innovation and technology policy (TIP), and EU, Engineering and Physical Sciences Research Council (EPSRC, now Research Councils UK), European Science Foundation (ESF), the European Network of Innovation Agencies (TAFTIE) and the Transformative Innovation Policy Consortium (TIPC). The RCN RRI framework document and most of the advisers and special advisers we interviewed both implicitly and explicitly states that RRI in RCN is

141 https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=2ahUKEwixxcbo05vdAhWBlSwKHWamD7EQFjA&url=https%3A%2F%2Fwww.forskningsradet.no%2Fservlet%2Fsatellite%3Fcid%3D12540180590826pagename%3DvedleggPointer%26target%3D_blank&usg=AOvVaw2tQnv4oUqxbkkMQRXUmPzC
142 http://www.oecd.org/inst/innovation-group-on-innovation-and-technology-policy.htm
143 http://www.esf.org/
144 http://www.taftie.org/
145 http://www.transformative-innovation-policy.net/
not perceived to be a project that should be conducted according to a specified method resulting in a final deliverance. Instead, RRI is understood to be an open process of learning. A process of learning about and development of reflective and inclusive approaches to the intersections of science, technology and society involving policy experiments, and assuming a willingness and ability to develop diagnostics, interdisciplinary dialogue and collaboration between fields of research, institutions and sectors. In terms of RRI, respondents see RCN as a developing and transforming organization, not as a finished organization, a box filled with a specific content that in this case could be RRI. In their view, RRI is an approach, a continuum of learning practices developing within the RCN and between the RCN, institutions and collaborators within the research and innovation sector, not something that is or is not “implemented” in the organization. RRI as learning in RCN is about organizational learning; RRI as learning is not the same as learning about RRI. Rather, RRI is learning in itself. The kind of learning implied here is mutual learning; a reflective, dialogue based learning approach and related to Argyris’ and Schön’s concept of ‘double loop learning’ (1978). It implies reflection on implicit factual and value based assumptions in the organization and in the research it funds, for instance on notions related to neutrality, excellence and autonomy. In these respondents opinions’, both RCN and RRI can thus be understood as concepts in transformation.

Still, the RCN has a written RRI document (developed in the four programs BIOTEK2021, IKTPLUSS, NANO2021, and SAMANSVAR), emphasising that applicants should:

- Look forward
- Think through
- Invite in
- Work together

These four principles correspond to the EPSRC’ AREA dimensions (anticipation, reflection, inclusion and responsiveness). Richard Owen, who was part of the group developing the AREA dimensions with the EPSRC, has also been an important adviser for the RCN in this field. The framework is currently under revision and it is not clear whether the concept of RRI will have the same prominent place in the next version.

The organizational structuring of RCN into divisions gave RRI a clear and dedicated priority in The Division of Innovation. The very challenge driven and future oriented programs BIOTEK2021, NANO2021, IKTPLUSS and SAMANSVAR were developed and administered by the division with an explicit focus on RRI as described in the RRI framework document developed for the four programs. RRI thus has a clear location in the organization where it was promoted and developed both by dedicated persons and in specific programs. In this way RRI is not just a “mainstreamed” approach watered down into the whole organization, but a distinct and concentrated point of action.

A. Main barriers (structural, cultural or related to interchange dynamics)

146 Samfunnsansvarlig innovasjon – Et RRI-rammeverk for BIOTEK2021, NANO2021, IKTPLUSS & SAMANSVAR
At the same time, this (former) organizational location of RRI specifically in the Division of Innovation can be a challenge and a potential barrier towards the further development and implementation of RRI in the RCN. Precisely the until recent organization of RCN into a Division for Science, a Division for Energy, Resources and the Environment, a Division for Society and Health, and a Division for Innovation demonstrates how strong the position of a mode 1\(^{149}\), linear understanding of the relationship between science and society, politics and innovation actually has been in the RCN. This becomes quite clear from the ways the divisions and their areas of responsibility and range of actions were described. The Division for Science was described as awarding “…funding in its open competitive arenas using scientific merit as the primary criterion, independent of considerations relating to politically-established priority areas.” (description from RCN’s official webpages), while e.g. The Division for Energy, Resources and the Environment was supposed to be “…responsible for research and innovation targeting national and global challenges associated with the energy, petroleum, climate, polar, environmental, marine and land-based resources sectors”. From a mode 1, linear understanding of the relation between science and society, politics and innovation this division might seem unproblematic and evident as it follows a logic of purity and hierarchy of value with basic, pure research at the top, followed by applied research, development, use and social benefit. From a RRI-perspective, however, the organizational division of RCN may result in an inability to realize one of the major insights emerging from an RRI approach to science and society; an insight described very clearly in the RRI framework document for IKTPLUSS, SAMANSVAR, BIOTEK2021 and NANO2021:

*Research interacts and is interwoven with other social, cultural and historical factors. The intermingling, complexity and dynamics of this co-production means that governance schemes based on distance and clear task distribution between research, technology, innovation and policy are unproductive. It is in recognition of this systemic complexity and dynamics that the vision of Responsible Research and Innovation has emerged*. \(\text{(RRI framework document, RCN)}\)

The idea that the organization of RCN may represent a challenge in itself to the implementation of RRI in RCN was also formulated by some of the interviewees describing that the organization as not really “rigged” for trans-disciplinary, inter-divisional work\(^{150}\). It is not clear whether the portfolio management approach in the ‘RCN 3.0’ model will overcome this barrier from an RRI point of view.

Another important barrier concerning RRI in RCN is the *competence* of the staff. While the staff, the special advisers, senior advisers and directors, are all highly competent in terms of educational merits and ability to evaluate, administrate and manage major research programs and projects, some of the interviewees argued that too few of the advisers had the educational background necessary for driving and developing RRI in RCN. Most of the advisers have traditional university or professional educational backgrounds from single scientific areas while the competence required pertaining to RRI often would be Science and Technology Studies (STS) or other cross-cutting science studies backgrounds.

This barrier is to some extent interwoven with another potential barrier, namely that of RRI as a strongly person dependent and person driven project in the organization. RRI in RCN is developed by a handful of highly dedicated persons that cannot be supposed to drive the process alone into an endless future. While the persons involved are explicit and clear about RRI as an open learning process that cannot be owned by anyone the dedication to the learning processes inherent in RRI demands a lot of these persons and for the moment RCN has not organized a robust learning system in terms of personnel around RRI outside the programs and projects where RRI is an integrated part. While personal


\(^{150}\) The new portfolio management strategy will address some of the challenges related to sectorial systems in the Council.
dedication is necessary when RRI is interpreted as a learning and development process, it is at the same time risky and vulnerable in an organizational sense.

The last and perhaps most complex barrier, or rather, challenge that must be included here is the researcher societies surrounding RCN. While a lot of mutual learning is going on between RCN and the researchers and institutions involved in the programs where RRI is an explicit priority, the researchers and institutions in Norway still approach RCN as mainly a research funder presupposing a traditional relationship between science and society, where the research funder is simply a facilitator of excellent research as defined by the research community itself, following a “fund and forget” or a “pay and pray” logic.

B. Main drivers (structural, cultural or related to interchange dynamics)

Above we have identified RCN’s main strategy as a driver for RRI. This is anchored in other drivers, such as the Government’s Long term plan for research from 2014 (see chapter 5) and the two Technopolis evaluations, which have called for the RCN to take a stronger role as change agent in the Norwegian research and innovation system. The Digital Life Centre can be seen as an example of such experimentation in being a change agent.

A further driver is developments in research councils similar to the RCN (especially the Division of Innovation). Most important here has perhaps been equivalent organizations in the Netherlands and in the UK.. The European Commission (EC), with its Science-in-Society and Science-with-and-for-Society programmes have perhaps functioned as a driver for RRI in the RCN at large, but the Division of Innovation has generally been quite critical to the EC approach of RRI keys.

Another driver is the community of researchers the RCN itself has built up through the ELSA 1 and 2 programmes. Staff from the Division of Innovation regularly interact in learning processes with this community. The personal commitment of some individuals in the RCN (‘RRI champions’) cannot be underestimated, though. These individuals have over years been active in translating overall policy signals into concrete actions, including the walkshop and the RRI framework, and in building awareness and legitimacy for RRI in the Division for Innovation.

Portfolio management can potentially also be a driver for RRI in the RCN. If RRI perspectives are to be continued for emerging technologies, they may also be included in the set of criteria for assessing project proposals to be standardised for the evaluation process for all kinds of projects.

C. Best practices

Many of the interviewees emphasize the importance of the establishment and development of the programs IKTPLUSS, SAMANSVAR, BIOTEK2021 and NANO2021 for the consolidation of RRI not only in RCN but also in the research and innovation sector in Norway. The programs all put RRI and the societal challenges well on the research agenda, and demand commitment of the researchers involved in the program activities in terms of reflection, co-production and inclusion. The programs also function as important platforms of knowledge sharing and learning - a key dimension of RRI in RCN that we will return to. An interviewee described e.g. BIOTEK2021 as «a flagship for experimentation». The programs as learning platforms (with seminars for Ph.D.-students and postdocs) and the specific calls from the programs (where the RRI-challenge is explicitly put on the research agenda at proposal level) is thus a decisive driver for RRI in Norway.

Both the RRI framework for IKTPLUSS, SAMANSVAR, BIOTEK2021 and NANO2021, the programs’ activities and many of the interviewees emphasize aspects of learning, process and openness as opposed to fixation and ownership of RRI. Learning is described as essential to the development of RRI in RCN, both in terms of internal processes of competence diffusion, through cooperation with external experts like Richard Owen, Arie Rip or Roger Strand, and through Ph.D.- and researcher schools that explicitly put RRI on the agenda. Other important learning and development platforms in terms of RRI
are experiments like “IDÉLAB” (where researchers from different disciplines get together and start cooperating around specific challenges)\textsuperscript{151} and the establishment of the Center for Digital Life Norway\textsuperscript{152}. The Centre for Digital Life Norway (DLN) is a national center for biotechnology education, research, and innovation. It is run as a collaborative project by the University of Oslo, University of Bergen, and the Norwegian University of Science and Technology, supported by the RCN’s BIOTEK2021 programme. The activities at the center are organized in a governance and networking project, which includes a research school, and several research projects. The centre facilitates transdisciplinary cooperation across institutions and fields of research, and between projects. The host institutions of the research projects at the center constitute the hub-and-node-structure of the network. For the interviewees describing RRI as an ongoing, open learning process the DLN was described as a “demonstrator” of how RRI could be developed in and between RCN and its surroundings, preventing it from being stifled in check boxes and administrative exercises.

Figure 4 explaining RRI as a cross-cutting dimension of the Digital Life initiative.

The importance of learning, process and openness are based on the RRI-dimensions developed by the British Engineering and Physical Sciences Research Council (EPSRC) that are sometimes called AIRR, i.e. Anticipation, Inclusion, Reflection and Responsiveness and, according to RCN’s RRI framework document, the ambition in RCN is to develop processes characterized by the AIRR-dimension:

“It is important to stress that RRI is a figuration; it is open, not “owned” by anyone and therefore invites and inspires experimentation, development activities and learning across established boundaries, sectors and disciplines. In this respect RRI is a means unto itself; in the words of René von Schomberg, a driving force behind early RRI efforts under the European Commission: “RRI is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other... We want to continue the work by and for RRI through learning- and development work in dialogue with the research communities we fund.” (RRI framework document, RCN). They highlight that the EPSRC formulates new expectations not only to the research communities they collaborate with, but also to itself as a responsible societal actor, and wish to build on this approach.

This understanding of RRI is positioned as the direct opposite of the narrow box-ticking activity that many of the interviewees in RCN associate with the EC RRI keys.

The RRI framework document may be called a best practice for RCN, even if it is inspired by the AREA framework of the EPSRC.

D. Current indicators (if any)

\textsuperscript{151} https://www.forskningsradet.no/progrnett-lab/Forside/1253988607568
\textsuperscript{152} https://digitallifenorway.org/gb/about-center
There are no current indicators related to incorporation of RRI in certain areas of the RCN’s work.

E. **All points of improvement (suggested by interviewees or RRI-Practice researchers)**

The points of improvement were developed with the contact persons and are presented under point F.

F. **Agreed points of improvement, with action plans and indicators for success**

Many points of improvement pertaining to RRI and responsibility have been discussed with the key interviewees and the focus group in RCN. Their main message is that RRI in RCN is about learning and experimentation and that indicators and action plans make little sense against such a backdrop. Instead they suggested a range of processes (organizational, educational, policy related) dealing with the challenges described in the section on barriers above and in the outlook-note prepared for the focus group in the Spring of 2018. The processes can be interpreted as **stretch goals** more than points of improvement, but indicate the scope of RCN as a learning organization:

- Frequent courses about the context and policy landscape for research and innovation in Norway and internationally.
- More focus on facilitating proposal development processes. RRI can be conceptualized as an «extended IDÉLAB» in RCN.
- The goal is not that the whole of RCN «goes RRI». As one of the interviewees formulates: “We do not have the capacity, and the surrounding research institutions are not ready for it. We can’t have Digital Life in the entire RCN. What we can do is to strengthen the understanding of issues pertaining to science and society in general”.
- Digital Life can function as a demonstrator of how to develop and learn with RRI internally. The internal communication about Digital Life in RCN can be improved.
- RRI should be developed into and institutionalized as a criterion of good research quality.
- There is a lot of international cooperation going on between RCN and other institutions that affect and will affect the future of RRI. This cooperation should continue and be intensified. The cooperation is not just important for RCN’s external activities, but also for the internal discussions about RRI and the relation between science and society.
- Walkshops will be a permanent element in the research school for Digital Life. Discussions are arranged out in the open, in the mountains, the forest etc. and the participants are supposed to reflect and share their presumptions with one another while walking.
- RRI should be further developed and integrated into courses for research directors and research group leaders where the attention should be paid to organizational learning and/in management, rather than management alone.
- Applicants to RCN different research programs should be offered courses in RRI.
- RRI should be perceived as a “stretch-goal” and a “shared space”, not a receipt. This insight will be part of the revised RRI framework for RCN.

7.2.3 **Ethics in the organization**

A. **Description of the practice and its development**

At one level, ethics in RCN is about standards, principles and concrete guidelines for the research being funded over RCN’s programs. This concerns vital aspects of research ethics that might be violated
(consciously or unconsciously) by researchers during the research process. Important aspects here are transparency, impartiality and integrity that might be violated by misconduct related to fabrication, falsification and plagiarism, skewed research because of conflicts of interest, and so on. Projects funded by the RCN are thus to maintain "high ethical standards and uphold fundamental principles for good practice, integrity and ethics in research"153.

A check list for “ethical research” has been developed in RCN and all applicants for research funding have to make sure that their proposals are in accordance with this check list. The document states clearly that grant applications submitted to the RCN must explain "any relevant ethical questions and will be assessed on the basis of this"154. It continues: “Grant applications submitted to the Research Council must review and clarify any ethical issues related to the implementation of the project in the project description and provide a description of how such issues will be dealt with. The project description must be written in compliance with good research practice. The project description is to be an original text, and all sources, quotes or use of other texts must be correctly cited and appropriately attributed to the relevant sources.

Research institutions are responsible for ensuring that the research activities carried out under their auspices take place in accordance with accepted research ethics standards.” “Accepted research ethics standards” in the RCN context refers to the general ethical guidelines for research as well as thematic guidelines drawn up by The Norwegian National Research Ethics Committees155. The check-list further explains that proposals deemed eligible for funding subsequent to scientific assessment will be reviewed in light of a set of “other selection criteria, including ethical perspectives”. This review is generally carried out by the RCN administration and/or the granting committee/programme board.156 The check list then continues with a description of the Project Owner’s (the party with whom the RCN has a contract) responsibilities pertaining to audit and control. The document ends with the following statement: “All breaches of contract, including violations of good research practice, may lead to the termination of the project. The Research Council will then have the right to claim reimbursement for disbursed allocations.”157

While this check-list by some of the interviewees was described as a proof of the reduction of ethical concerns and RRI to a formalistic exercise, other interviewees described it as an exercise that nevertheless forces researchers and research institutions to seriously consider the ethical aspects of their research. If the applicants do not make the necessary considerations about the ethical aspects of their proposed research they just don’t get any funding158. In this way the check list is a powerful instrument.

Another dimension of ethics in RCN concerns ethical dilemmas emerging from questions about what kind of research and innovation RCN should be funding. Two cases of this kind of dilemma are mentioned in the interviews and are also known from Norwegian media: In one of the cases the RCN was criticized for awarding the Innovation prize in 2013159 to a drone producing company that was also producing equipment for military purposes. In the other case The Norwegian National Research Ethics Committees, in 2013, questioned that RCN funded a company that was developing surveillance technology. The two cases put ethical dilemmas directly related to RCN activities both on RCN’s and the public agenda. According to one of the interviewees these two cases raised even more awareness about

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155 https://www.etikkom.no/en/
156 https://www.forskningsradet.no/en/Article/Research_Ethics_checklist/1182736871270
158 We have not been able to determine whether this has ever happened.
159 https://www.forskningsradet.no/prognett-bia/Nyheter/Mikrohelikopter_vant_innovasjonsprisen/1253989670468?lang=no
both ethics and responsibility in RCN as it was made clear that RCN’s choices were regarded to be of public interest.

Ethics, within RCN’s historical context, can also be traced back to ethics as it has been conceptualized in the ELSA programs 1 and 2, lasting from 2002 until 2012. The background for the program was the ELSI (Ethical, Legal and Social Implications) program that was introduced in the context of the US Humane Genome Project (HGP) around 1990. The RCN initiated a separate program on Ethics, Society and Biotechnology in 2002. The program lasted until 2007. Also the large scale program Functional Genomics in Norway (FUGE, 2002-2011) from its inception decided to spend 3-5% of its funds on research concerning ethical, social and legal aspects of functional genomics. In 2004-2005 RCN’s large scale program in nanotechnology and new materials, NANOMAT analyzed relevant aspects of health, environment, risks, ethics, law and society. A report on the topic was published in collaboration with the National Research Ethics Committee for Natural Science and Technology and the Norwegian Board of Technology. The NANOMAT program funded ELSA research projects since 2006, and the Work Program for 2007-2016 expressed a clear commitment to ELSA activities. "Ethics" in this context has denoted attempts at clarifying and deliberating normative questions concerning the shaping of science and innovation. In 2006 the RCN appointed a planning group tasked with reporting on challenges facing research on ethical, legal and social aspects of biotechnology, nanotechnology and cognitive sciences and making recommendations on how such research should be organized in the future. The planning group delivered its report in June 2007. The RCN decided to follow the recommendations of the planning group to establish a new ELSA program with a broadened scope, encompassing nanotechnology and cognitive sciences in addition to biotechnology. Alongside this development of ELSA research and integrated projects RRI has gradually come to the fore both internationally and in RCN.

In RCN ethics is now stretched out in a continuum between being the object of a check-list of standards and guidelines pertaining to research ethics and ethics in research as a concern in itself, first in terms of ELSA and now RRI.

Earlier the National Research Ethics Committees were organized under the RCN, though they were independent committees. Now the responsibility for more overall discussions of research ethics and follow-up of the research communities are organized in a division of labour distributed to these committees.

B. Main barriers concerning approaches and practices pertaining to ethics in RCN

A main barrier is that ethics and assessments in terms of ethics, as it is conceptualized in RCN’s current guidelines and principles, is individualized and considered to be of less importance than the scientific assessment. Ethical considerations run the risk of becoming add-ons to the “real” research project in the proposal and funding process.

Another barrier is that ethics as research integrity is becoming challenging as the pressure to publish pushes some researchers into research ethical greys zones that RCN does not have the capacity to discover or punish. Most advisers in RCN have no training in, nor resources for, detecting research fraud or evaluating research practice or conduct as such.

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One interviewee expressed a concern that there are too many concepts pertaining to research ethics in circulation in the organization. For instance ethics, integrity, honesty, code of conduct, in addition to RRI, responsibility and normative laden conceptualizations of sustainability. Too many concepts may result in either alienation or a need for simplification that reduces ethics to an administrative exercise in ticking boxes.

C. Main drivers concerning approaches and practices pertaining to ethics in RCN

Drivers for ethics is a thorough support for the need for conducting research in an ethically good and responsible way, both in the population at large, among politicians and the government and among RCN staff. In addition to the self-evidence that research must be conducted in an ethical fashion, fears related to potentially diminishing trust in science is also a motivating factor for a focus on ethics.

D. Best practices

That projects funded by the RCN are to maintain “high ethical standards and uphold fundamental principles for good practice, integrity and ethics in research” may look only like an administrative exercise, but is at the same time a means to keep ethics both on the research funding and the research performing agenda. In fact, projects funded by RCN must systematically include considerations on ethics. This may have a constructive and pedagogical positive effect on the researchers and the institutions applying for research funding by the RCN.

The ELSA 1 and 2 programmes and the current SAMANSVAR programmes, as well as funding in other big technology programs, have contributed to Norway having a substantial community of researchers and practitioners in applied ethics, ELSA and RRI. This effort over years, must be considered a best practice of a research council.

E. Current indicators (if any)

No particular indicator, but an intention that all projects funded by RCN will continue to have a high ethical standard.

F. All points of improvement (suggested by interviewees or RRI-Practice researchers)

Conceptual clarity pertaining to research ethics.

G. Agreed points of improvement, with action plans and indicators for success.

No.

H. Resulting matrix

See annex B

7.2.4 Societal engagement

A. Description of the practice and its development

In RCN societal engagement includes a substantial information and communication department for informing the public, including the RCN website, social media, press statements, etc. They also include societal stakeholders in the boards, from the board of the Council as such, to boards at division and programme levels (where the latter will be mostly terminated in the new RCN 3.0 model). In their research funding, societal engagement take the form of user and stakeholder involvement. User involvement is a common requirement in applied programmes and there are indeed funding schemes
that are explicitly user driven, such as the Programme for User-driven Research-based Innovation (BIA)\textsuperscript{162}.

Societal engagement in the sense of including citizens or wider societal groups in two-way deliberative processes (consensus conferences, citizen’s juries, etc.) is not an established practice in the RCN, neither at the institutional or the programme levels. In some funding calls, for instance in the SAMANSVAR programme, this is requested as a part of the RRI framework. Thus, there is some societal engagement activities in research projects in biotechnology, nanotechnology and ICT, and most likely also in some other research project funded by other programs in the RCN.\textsuperscript{163} However, societal engagement does not seem to be a prioritised dimension of RRI in the RCN. In the project’s focus group, the status of societal engagement was discussed and one of the participants emphasised that in terms of RRI as learning, it was more important to make the scientists understand that they are indeed citizens (i.e. value led and not simply representing objective truth in a ‘view from nowhere’), rather than including citizens in the research.

While ‘citizen science’ has become important in European research policy, there has been less of an emphasis on this in the RCN. However, there have been some initiatives, such as the Research campaign\textsuperscript{164}. This is a nation-wide citizen science project where primary school pupils help researchers gather and register data that otherwise would be hard to collect. The RCN coordinates this initiative and make annual calls for researchers that would like to ‘commission’ pupils in the work. This initiative is seen in connection with the Research days (see the section on Science education below).

B. Main barriers concerning approaches and practices pertaining to societal engagement in RCN
An important barrier to societal engagement and citizen science is a lack of awareness in the research communities about the benefits of such activities.

Another barrier is that there are no particular national level policy documents requiring societal engagement in research.

User engagement, especially in applied research, is already widespread, but a barrier is that such involvement can easily be turned into check-box activities in proposals and projects, i.e. that the involvement is not meant seriously.

At an overall level, a barrier to implementing more societal engagement in RCN may be that this is outsourced to the Technology Board, which is (rightly) considered an expert in such activities.

C. Main drivers concerning approaches and practices pertaining to societal engagement in RCN
RCN’s mandate, role and main strategy drives encourages societal engagement. The recent survey showing reduced trust in research in the Norwegian population (see chapter 4) may result in increased attention to societal engagement. The EU’s current emphasis on societal engagement and citizen science may also function as a driver for strengthening this in RCN calls. The new Open science policy may also be a driver for increased interaction with society in general.

D. Best practices

\begin{flushend}
\textsuperscript{162} https://www.forskningsradet.no/servlet/Satellite?c=Page&cid=1226993636038&p=1226993636038&pagename=bia\%2Fhovedsidemal
\textsuperscript{163} NB! We have not conducted an analysis of all the calls and the funded projects in these programmes, so we do not have an exact status on the inclusion and quality of societal engagement in funded projects.
\textsuperscript{164} https://www.forskningsradet.no/no/Nyheter/Forskningskampanjen_2017_soker_forskningspartner/1254023945692?lang=no
A good practice in the RCN is the Research campaign, described above.

E. Current indicators (if any)
Societal engagement as such does not appear to have specific indicators. Specific programs, such as BIA, and institutional activities such as communication, are regularly assessed related to the overall objectives, but are more peripheral to societal engagement in the RRI sense.

F. All points of improvement (suggested by interviewees or RRI-Practice researchers)
We suggest to initiate more debate about the societal role and responsibilities of scientist(s) within the RCN and with stakeholders and society in general. We also suggest to consider whether explicit societal engagement strategies should be developed for the RCN as an organisation, and for specific programs. This can be part of the process of setting up a new Open Science policy in the organization. An indicator for success would be that societal engagement is seen as a part of the concept of excellence in research.

G. Agreed points of improvement, with action plans and indicators for success.
No.

H. Resulting matrix
See annex B

7.2.5 Science education

A. Description of the practice and its development
In the research funding programs science education as a part of research is not generally mentioned, but RCN takes a role in science education in a more direct way. One way is that they have contributed with financial support to museums that communicate and introduce children and young people to science and research through the Vitensenterprogrammet (2010-2014)165. Another way is through the national science education program Nysgjerrigper166. Nysgjerrigper is RCN’s program for children and young people in Norway, especially pupils and teachers within primary and secondary education institutions. The program aims at getting children and young people to know what scientific research is and to make them consider working as researchers. Nysgjerrigper is a Norwegian word refering to a curious (“nysgjerrig” is Norwegian for curious) person (actually a man, since “Per” is a man’s name). The project aims at trigging the (natural) curiosity in children and young people and channeling it into a scientific approach to what makes them curious. From Nysgjerrigper’s website: “A nysgjerrigper is one who dares to ask questions and who wants answers to what he or she wonders about.”

Future climate crisis situations and the need for diverse and sustainable energy production and consumption, as well as a sustainable development of the welfare state for future generations is the important backdrop for the program. The program also involves a competition, the Nysgjerrigperkonkurranse, where pupils at different schools compete with different self-made scientific projects, and promotes the so-called Nysgjerrigpermetoden, a method for scientific research customized for children.

A general observation is that science education gets confused with marketing of science and great scientists. There is a tendency to focus on the hyped stories about scientific successes and idealised versions of scientific work. An important part of science education is to build capacity among the

165 https://www.forskningsradet.no/no/Utlysning/VITEN/1253968113415
166 https://nysgjerrigper.no/Artikler/om-nysgjerrigper
population to take an informed stance towards science and technology, and make them informed to
engagement more with science. This would require a stronger emphasis also on understanding scientific
uncertainty, risks, challenges in scientific methods, etc. However, this does not seem to be in focus. In
stead, many of the activities funded by RCN emerges from a concern that today’s children and young
people are not interested in natural sciences and technology (except from being consumers of
entertainment technology). This concern means that many of the activities directed towards children is
directly or indirectly promotional in the direction of natural (or “real”) science as career, while
humanistic and social sciences are to a large extent ignored. In terms of RRI as a learning process one
runs the risk of making citizens interested in science, but not helping scientists to become interested in
being citizens.

B. Main barriers concerning approaches and practices pertaining to science education in RCN

An important barrier is that science education as an element of research is not mandated in any national
level documents. Science education is seen as the responsibility of certain dedicated institutions, such as
Vitensentrene, etc., as well as dedicated functions in the RCN. There is thus not much emphasis on this
in calls for proposals, and consequently not much emphasis in proposals from the research
communities.

C. Main drivers concerning approaches and practices pertaining to science education in RCN

An important driver for science education in RCN is the concern described as a barrier; a concern that
children and young people are not really interested in natural sciences.

In terms of RRI a more promising driver for science education is the process towards a new Open
Science policy for RCN going on in the organization. This process will involve questions and perspectives
about the relation between science and citizens that can perhaps push the citizen science concept a bit
further, i.e. beyond the concern for future generations not understanding or being interested in natural
sciences.

D. Best practices

Nysgjerrigper (described above) is a good and successful practice in terms of traditional science
education.

E. Current indicators (if any)

We have not identified specific indicators with regard to science education as part of research.

F. All points of improvement (suggested by interviewees or RRI-Practice researchers)

We suggest more collaboration between the advisers responsible for communication and the ones
responsible for developing RCN’s Open Science policy.

G. Agreed points of improvement, with action plans and indicators for success.

No.

H. Resulting matrix

See annex B

7.2.6 Gender equality and diversity strategies in the organisation

A. Description of the practice and its development
Within the RRI-framework, gender equality is understood as a three-dimensional construct whereby gender equality is reached when (1) women and men are equally represented in all disciplines and at all hierarchical levels, (2) gendered barriers are abolished so that women and men can develop their potential equally, and (3) when the gender dimension is considered in all research and innovation activities. The construct of ‘gender equality’ (GE) in research and innovation may be expanded to ‘gender equality and diversity’ (GE&D) accentuating organizational efforts to promote equality, diversity and inclusion in terms of different socio-demographic characteristics (age, ethnicity, disability, race, etc.).

According to Norwegian legislation all public institutions in Norway must take active steps to promote gender equality. RCN has national responsibility for research policy-related activities to analyse and develop gender research, gender perspectives as well as gender equality in research. The Council is also responsible for initiating, implementing and monitoring research activities within this field. RCN tries to develop a framework for increasing the recruitment of women to subjects with a low percentage of women and develop initiatives to boost the proportion of women in tenured academic positions.

In RCN the main attention pertaining to this key has been on gender equality, gender balance and gender perspectives and not on diversity. This is not because diversity is considered to be unimportant in the organization, but because gender equality and gender perspectives influenced by state feminist discourses historically has been a strong and important element in RCN’s strategies and policies.

Until 2012 RCN had in its program portfolio a program dedicated to gender research. This program was terminated based on arguments that gender perspectives and gender equality should now be “integrated in all research activities funded by RCN” and not something that could be dismissed in mainstream research and research programs by reference to one dedicated program taking the sole responsibility for gender and gender equality.

In all project proposals, applicants are expected to address the issue of gender balance in the consortium and potential relevant gender perspectives in their research.

In terms of gender balance the RCN during the last ten years has in particular been concentrating on leadership and top management in science and research. RCN has established a program dedicated exclusively to gender balance at the top level of research and research management. The Initiative on Gender Balance in Senior Positions and Research Management (BALTICE) seeks to promote gender balance at the senior level in Norwegian research through new knowledge, learning and innovative measures. The main arguments for the initiative is that gender balance fosters quality in research, enhances the relevance of research to society, and improves the competitiveness of research groups. The vision is that Norway will be the European leader in gender balance in top-level positions and research management.

The BALTICE initiative is based on three main areas of activity:

- funding of BALTICE projects at the institutions;
- support for knowledge development and new research;
- establishing of a national learning arena in the field.

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168 https://www.forskningsradet.no/en/Gender_issues/1195592877653
170 https://www.forskningsradet.no/prognett-balanse/Programme_description/1253964606599
Started up in 2013 the initiative will run for a minimum of ten years, and plans call for an overall budget of about NOK 118 million (ca € 12 million).

Two discussions have occurred in the wake of RCNs gender balance policy. One has raised the question of whether RCN’s gender balance policy is knowledge based and actually is connected to a gender perspective. The other questions more explicitly the assumption that more female professors and gender balance will lead to more gender perspectives in research. In this discussion the lack of men doing research with gender perspectives has also been mentioned.

Another challenge concerns the relation between RRI and gender equality as a political goal. According to some interviewees there are some discursive and political tensions between the struggle for gender equality in research and RRI concerning the question of power. While gender equality in Norway has a historical framework of reference based on a state feminist engagement for economic and political independency and equality for women, RRI is interpreted as a project that by and large ignores historical and current power relations (economic, social, political, cultural) and the way they influence our conception of research, innovation and society. One could perhaps say that while gender equality politics is understood as necessarily conflict oriented, RRI is conceived of as basically harmony oriented, and that this influences the way RRI is understood by the persons involved in gender equality work and politics in RCN.

B. Main barriers (structural, cultural or related to interchange dynamics)

No particular barriers have been identified in our research.

C. Main drivers (structural, cultural or related to interchange dynamics)

The most important drivers for gender equality in RCN are a) the special advisers that are among the experts in Europe as regards gender equality and gender balance in research, and b) the positive attitude in the Norwegian society towards gender equality as such. Gender inequality in research and innovation is a fact, but at the same time recognized as a problem.

D. Best practices

The Initiative on Gender Balance in Senior Positions and Research Management (BALANSE) – described above.

E. Current indicators (if any)

Both horizontal and vertical gender balance in all projects funded by RCN.

F. All points of improvement (suggested by interviewees or RRI-Practice researchers)

RCN wants to continue to promote gender balance in their communications with ordinary citizens, take a leading position in the European Research Area (ERA) pertaining to gender balance in research, increase the share of female project leaders among their funded projects, use moderate gender quotation in funding processes, assess gender perspectives in all steps of all applications for funding, assess the implications of gender perspectives in the further development of research programs, and activities and include gender perspectives in RCN’s annual report.

G. Agreed points of improvement, with action plans and indicators for success

171 http://kjonnsforskning.no/nb/2014/11/forskningsradet-mangler-kompetanse-pa-kjonn

172 http://kjonnsforskning.no/nb/2016/01/vil-flere-kvinnelige-professorer-gi-mer-kjonnsperspektiver-i-forskningen
No specific actions in the context of the RRI-Practice project were agreed as RCN already has specific action plans on gender.

H. Resulting matrix

See annex B

7.2.7 Open access and open science strategies in the organisation

A. Description of the practice and its development

RCN’s policy and guidelines pertaining to open access conform to the Nasjonal strategi for tilgjengeliggjøring og deling av forskningsdata [“National Strategy on access to and sharing of research data”, currently Norwegian only] issued by the Norwegian Government in December 2017. According to RCN’s policy «Open access to research data»¹⁷³ the RCN’s policy follows an open-by-default principle regarding access to research data. The Research Council will therefore help to ensure that research data in general are made openly accessible, but that exceptions are made for data that cannot or should not be openly accessible (in particular, data that might identify individuals). The Horizon 2020 programme’s definition of open access¹⁷⁴ states that access to scientific information must be, as far as possible, free of charge. The Research Council has decided to base its policy on the premise that the user should cover the actual costs incurred from data retrieval. This is closer to the OECD’s definition of open access¹⁷⁵, which states that access must be provided at the lowest possible cost, preferably at no more than the marginal cost of dissemination.” (RCN 2017: 5) RCN’s policy on open access also includes the FAIR principles for so called “sound data management”: “The international FAIR Principles have been formulated as a set of guidelines for the reuse of research data. The acronym FAIR stands for findable, accessible, interoperable and reusable¹⁷⁶. That means that research data must be of a quality that makes them accessible, findable and reusable. The concept interoperable entails that both data and metadata must be machine-readable and that a consistent terminology is used.” (RCN 2017: 5)

RCN’s policy on open access prescribes a set of guidelines for storage, management, dissemination and sharing of research data and metadata¹⁷⁷.

An essential part of RCN’s practice pertaining to OA revolves on the research conducting institutions’ practice. Advisers responsible for following up the institutions have extensive communication with the institutions informing them about the possibilities and requirements they have as regards OA thus building capacity at institutional level through education and availability. The advisers travel out to the institutions and answers questions from the institutions thereby securing a manageable division of labour pertaining to OA in the research and innovation sector in Norway. Moreover, the advisers in RCN make policy recommendations at ministry level in order to influence the policy development of OA. Finally, the advisers in RCN are responsible for following up the international development in the area, for instance the development of the European Science Cloud that will be able to connect all data and

¹⁷³ Revised version from 2017.
¹⁷⁷ RCN 2017 Nasjonal strategi for tilgjengeliggjøring og deling av forskningsdata [“National Strategy on access to and sharing of research data”]. Revised 2017.
infrastructure and which will involve high levels of standardization and certification, as well as policy and law development.

As the EU is now “…moving decisively from ‘Open access’ into the broader picture of ‘Open science’.”178 (OS) so too is RCN. According to one of the special advisers interviewed the turn towards OS is and will continue to be a great challenge for RCN, as it will be for all research and innovation conducting and funding organizations in EU. It is still not clear what OS will imply, but a working group on OS has been established in the RCN.

B. Main barriers (structural, cultural or related to interchange dynamics)

According to one of the interviewees it is a challenge for the development of a sensible Open Access policy that the concept is both complex and broad and that there are many dimensions, questions and similar concepts that can be associated with it. In addition, what counts as research data can vary across institutions. As a result, staff, when engaging with different research institutions in Norway, receive a great deal of questions about OA that they

“...just can’t answer. These are challenging questions posed out there in the institutions with a point of departure in different interests, e.g. pertaining to qualitative data, legal issues and so on... The thing about “open” is not that everybody may now see everything, but about what’s fair; that the public now knows that the different data sets exist, that they can be described in meta data.”

The turn to Open Science has added to the complexity by multiplying the range of dimensions being encompassed by the notion of “openness”. It is no longer merely a question about access to data, but access to the scientific research and innovation process itself, thus involving questions concerning communication, ethics, engagement and the very role of the scientist/researcher itself.

An important principle for RCN is to make the institutions co-responsible for OA as it is practiced in both research and innovation. At the same time OA is based on voluntary participation in the national strategy as regards the institutions, so RCNs challenge can, according to one interviewee be that

“...perhaps we are too soft on the institutions, not strict or challenging. Perhaps it would have been easier to be strict. But a lot of things are happening in this field all the time and you have to be flexible. We have to reflect on our own practice all the time, should we be stricter, more demanding in relation to the institutions, or should we listen even more to them?”

C. Main drivers (structural, cultural or related to interchange dynamics)

The most important drivers in RCN’s OA and OS work are RCN’s own strategy, in addition to the mandate from the Ministry of Research and Education, and policy developments in the EU and the OECD.

Lately, the RCN has established a cross-disciplinary and cross-divisional group of advisers and special advisers working with both OA, innovation, RRI, communication and science education with the purpose of developing RCN’s policy on OS.

D. Best practices

RCN has a close and systematic dialogue with the research performing institutions in the sector. Through these dialogues RCN can exchange ideas and get feedback on their work pertaining to OA. According to an interviewee this makes it easier to avoid «...introducing requirements that make it more difficult to be a researcher.» Self-evaluation and self-reflection is an important part of the OA advisers’ and special advisers’ practice in RCN.

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E. Current indicators (if any)

The RCN monitors publications deposited in knowledge archives in their funded projects.

F. All points of improvement (suggested by interviewees or RRI-Practice researchers)

According to the interviewee with special responsibility for the OA/OS key it is: “...important to find a good division of roles, what should RCN do and not do. Find some good principles. Find ways to finance this. This [OS – CE] is a tsunami coming now. Not all are prepared for it.”

G. Agreed points of improvement, with action plans and indicators for success

A new OS policy for RCN is under development.

H. Resulting matrix

See annex B

7.2.8 Incorporation of AiRR dimensions into policies

As noted previously RRI in RCN is conceptualized as an open ended learning process. The importance of learning, process and openness are based on the RRI-dimensions developed by the (EPSRC) i.e. Anticipation, Inclusion, Reflection and Responsiveness (AiRR) and, according to RCN’s RRI framework document, the ambition in RCN is to develop processes characterized by the AiRR-dimensions.

Please see 7.2.1 for a description of how anticipation, inclusion, reflection and responsiveness are incorporated into RCNs program and policy developments.

7.3 Reflection on Review findings, Outlooks developed and ways forward

As noted, approaches to, and practices pertaining to, RRI in RCN is a question of discursive developments both within the organization and outside, both nationally and internationally. Furthermore, many of the RRI-related activities in RCN unfold as collaborative activities and network activities together with actors outside of the organization. RRI in RCN is thus characterized by important interchanges. RRI in RCN builds on insights and approaches both from programs like ELSA and collaboration and inspirations from organizations like the OECD, especially the Working group on innovation and technology policy (TIP179), the EC, the Engineering and Physical Sciences Research Council (EPSRC, now Research Councils UK), European Science Foundation (ESF180), the European Network of Innovation Agencies (TAFTIE181) and the Transformative Innovation Policy Consortium (TIPC182).

The most central documents concerning RRI in RCN and most of the advisers and special advisers interviewed both implicitly and explicitly states that RRI in RCN is not perceived to be a project that should be conducted according to a specified method resulting in a final deliverance. Instead, RRI is understood to be an open process of learning. A process of learning about and development of reflective and inclusive approaches to the intersections of science, technology and society involving policy experiments, and assuming a willingness and ability to develop diagnostics, interdisciplinary dialogue and collaboration between fields of research, institutions and sectors. In terms of RRI, the interviewees in RCN saw RCN as a developing and transforming organization, not as a finished organization, a box filled with a specific content that in this case could be RRI. In their view, RRI is an approach, a continuum of learning practices developing within the RCN and between the RCN, institutions and collaborators.

180 http://www.esf.org/
181 http://www.taftie.org/
182 http://www.transformative-innovation-policy.net/
within the research and innovation sector, not something that is or is not “implemented” in the organization.

Against this conceptual backdrop the Outlook for RCN was developed together with the key interviewees from the organization with a focus on learning and stretch goals. The stretch goals are formulated in the section pertaining to notions of responsibility and RRI in RCN (see above).

Regarding the keys no particular actions that can be ascribed to RRI-Practice were agreed on. There are several reasons for this. One important reason is that our main contact and discussants in RCN were advisers and special advisers in the Division of Innovation where RRI understood as a modality and vehicle for organizational learning and change. The processes emerging from RRI and AIRR-inspired work in RCN goes on independently of what is happening with the different keys in the organization. We interviewed advisers with special responsibility for the different keys, and as one can see from the section describing best practices pertaining to each key, a lot can be learned from this work. The different practices pertaining to particular keys like gender, ethics and open access in RCN is developed in accordance with policy development and regulations taking place both in Norway, EU and internationally independently of what is going on with policy development in terms of RRI. The interviewees from within and outside the Division of Innovation seemed to recognize this independency; not as a relation of competition between RRI and the keys, but as concepts that politically, legally and historically have emerged from quite different points of departure. As a recognition of this RRI-Practice has focused on action points in terms of RRI as a modality of learning and change as the main goal in RCN.

A final reflection on the review and outlook process in the RCN is in order. This took place in a time when the organisation was getting prepared for the new portfolio management model. All staff knew that there would be significant changes to the organisational structure as well as to the role of programme boards and the processing of research proposals, but there was much uncertainty as to what that would mean in practice. In the focus group we discussed whether the new proposal assessment system would mean that RRI could be streamlines even more in the Council, or – conversely – it might mean that programmes like BIOTEK 2021 would have less freedom to experiment in the future. Based on a view of RRI as learning, some participants in the focus group also doubted whether streamlining RRI would be a good idea. In any case, had the impacts of the forthcoming organisational change been clear, the outlooks developed in the RCN may have looked different.
8. Summary of findings on each responsibility dimension

We see from the preceding chapters that signals from the national policy level (ministries, law) influence the RCN, and the other way around. The Ministry of Education and Research also influence the whole research system. National level policy set the premises for OsloMet, as a public university bound by law and governed by the Ministry of Education and Research. In addition, policy signals are conveyed in more informal, networked ways. Moreover, through funding programs the RCN influences practice at OsloMet. The EU has an important function as an influential regional policy maker, and also directly through funding requirements.

Figure 5: Simplified diagram of influences in the research system

All these actors influence how the different aspects of RRI are implemented in practice. If RRI is to be strengthened, the most effective way would be if all actors pull in the same direction. Many actors can take action on emphasising the importance of RRI aspects and the more actors that put RRI on the agenda, the more force it will have as a guiding principle in the research system.

We have in the above chapters documented how RRI and its different keys and dimensions are treated by such different actors in the national system. In the following, we will reflect on the keys and dimensions in the light of both national and organisational findings.

8.1 The concept of responsibility and RRI

The adjective ‘responsible’ (in Norwegian: ‘ansvarlig’) is quite general and characterises subjects or actions that are appropriate and according to established norms. It can also indicate legal liability. When used, it often refers to correct procedures, taking all implications of actions into account. It does not have a specific status in national or organisational research policy, but is mentioned in different policy documents. ‘Social responsibility’ is established as an approach to organisational ethics and related to the societal mandate of an organisation (such as a research organisation) or an institution (such as science)\(^{183}\).

When addressing the content that is included in RRI (as described above) more specific terms are usually used, like research ethics, research integrity, open access, involvement of the public, etc. With the exception of NENT’s ethical guidelines for research ethics from 2007 (revised in 2015), the overall thinking about the transformed relation between science and society is initially not captured in responsibility terms, though this sometimes happens now as a result of the focus on the concept of RRI.

In Norway, the English acronym RRI is used, indicating perhaps that this is not a concept that has evolved organically in Norwegian discussions, but has rather been imported from abroad. This in itself is not a problem for the concept, as many other concept have been imported, for instance ‘impact’, ‘governance’, etc. However, concepts like ‘sustainability’ or ‘the precautionary principle’ have clear Norwegian words (‘Bærekraft’ and ‘Føre-var-prinsippet’), perhaps signalling deeper roots in Norwegian culture. ‘Public engagement’ is also a term which does not have a clear Norwegian equivalent and where one often refers to the English term.

When the English term RRI has currency in Norway, it is due to influences from the EC and the UK. The Division of Innovation has a framework of RRI, which is a result of a learning process with e.g. equivalent organizations in UK and the Netherlands, such as the EPSRC. Many research conducting institutions in Norway that deal with the programmes in the Division of Innovation will understand RRI in RCN terms. However, there is strong competition from the EC, where the RRI keys in particularly have had visibility.

Also the RCN relates to the EC RRI keys as they are to facilitate the participation of Norwegian research communities in the European framework programmes. However, the developers of RCN’s own RRI framework do not support this approach to RRI, so there is a tension within the RCN with regard to the correct understanding of RRI. This might lead to a change in terminology over time in order to ensure that Norwegian research communities do not confuse what is seen as the basic meaning of responsibility in research and innovation with historically contingent policy areas in the EC.

This ambiguity may amount to a barrier in the uptake of RRI in Norwegian research conducting organisations.

Oslo Met has not traditionally had a strong community of researchers that relate to the Division for Innovation, with the exception of the ICT department. This is currently changing, though, as OsloMet recently engaged in a joint venture with Simula Research about a new Centre for Digital Engineering, with a strong track record on research on ICT in general, including artificial intelligence. Emerging technologies are therefore of increasing importance in the new University. However, the RCN and the EC are both seen as important funders, and there is no basis in OsloMet for choosing one RRI approach over another. In fact, as has been documented in chapter 6, the RCN framework (the RRI process dimensions) is seen as slightly more abstract and hard to relate to than the RRI keys.

However, the RCN and OsloMet seem to share a focus on learning. We have seen in the RCN chapter that learning has a central position. This is also a core value of OsloMet. However, it is not highlighted in policy documents at the national level. This is perhaps not strange as learning (in this meaning) is more related to the organisational or management discourse of ‘learning organisations’ (see for instance Peter Senge184), and not to overall science policy. In Norway, the perspective of the ‘learning organisation’ and ‘organisational learning’ has been widely used and signals adaptive capacity, especially in organisations with highly skilled staff that expect to be heard, operating in quickly changing environments. Learning is therefore related to the AIRR dimension of responsiveness.

The focus on learning and adaptation is therefore probably not a result of policy signals from above (the Ministry of Education and Research), but rather a result of horizontal policy learning and imitation between organisations.

8.2 Ethics

Both in Norwegian policy, RCN practice and OsloMet practice, ethics has a strong position. It has a formal side, like avoidance of research misconduct and respect for privacy and data protection, animal experimentation regulations, etc. The checklist and guidelines also encourage broader ethical reflection. The main challenge seems to be the organisational awareness of ethical guidelines, which might be a problem if it is a symptom of a lack of interest in ethics among leaders, administrations and research staff. There is here a need for a stronger focus on ethics in practice, which also is required by the new Research Ethics Act of 2017.

8.3 Societal engagement

Societal engagement as a term is not much found in policy documents, but similar terms are often used, like user involvement and science communication. Participatory or action research has a long history in Norway, and is strongly support by the social partners as it increases the relevance of research for public and private organisations. Societal engagement is inherently part of RCN’s strategies as stakeholders and users are represented at different levels in the organisation. Societal engagement has also been part of ELSA and RRI perspectives, and is included in the RCN RRI framework as ‘inclusive deliberation’. However, experiments in involvement of groups of publics in research are as such not directly promoted in overarching science policy framework.

This is perhaps the reason why there is no systematic approach to societal engagement at OsloMet. Participatory action research and user involvement continue to take place, - as it has for a long time - but not related to the concept of societal engagement. However, when framing this established practice in terms of societal engagement, Norwegian research communities have a good platform for taking the lead in societal engagement projects internationally.

The Norwegian technology assessment (TA) tradition is also an important platform for societal engagement, but (as previously noted) this has traditionally been outsourced to the Norwegian Board of Technology.

8.4 Gender equality and diversity strategies

Attention to gender issues has been strong in Norway, in all societal sectors. Thus there has been a focus on gender equality in both the RCN and at OsloMet. There is currently a view that gender issues have to be mainstreamed and treated as a separate field of action. OsloMet is a best practice example on gender equality. Although this is a result of a long history of gender equality work, it is also influenced by the fact that the rector is himself personally a high-profiled champion of gender equality in academia. Generally in Norway, there is a movement from considering only gender equality to developing diversity policies in general, including focus on ethnicity, age, religion, sexual orientation, etc. However, work in the broader diversity field is not as established as gender equality efforts. This holds both at the national and organisational levels.

8.5 Open access and open science strategies

Open access has also been a topic for Norwegian policy for more than a decade. However, in 2015 only 16 % of publication were open access. In comparison, at OsloMet 80 % of articles published in 2016 are placed in a repository to become accessible; of these, 50 % are openly available in the digital knowledge archive ODA; and 23 % of published articles in 2016 are published directly in online Open Access
journals. An important reason for this strong performance has been an open access champion at OsloMet, who has succeeded in building both structures and cultural change in the organisation.

Important barriers to open access and open science have to do with science as an institution and must therefore be addressed at this level. Key actions are to reform the science assessment and incentive system, in order to incentivise open access publication (and sharing of data) and such reform has now been signalled. OsloMet practiced such an adapted incentive system for some years; however, for lasting effect, such measures must be at the level of the international science system.

8.6 The inclusion of science education into research

Encouraging young people to study science is a matter primarily of national policy, and is to a certain extent supported by the RCN as a national actor. Science conducting organisations, like OsloMet, are not coordinated to take a national responsibility here, but can contribute by adapting science communication to the broader public. Moreover, organisations, like OsloMet, that supply vocational teacher training can contribute by training and motivating teacher students. Apart from this, systematic science education activities were not found at OsloMet. Moreover, the science education agenda is not highly profiled in Norwegian research policy.

When it comes to RRI teaching, this is not at all found in national policy documents, but RCN takes a responsibility for such teaching in the summer schools funded in the Division for Innovation. OsloMet sees a responsibility of increasing the awareness of its staff and graduate students and have also started activities to make education and training resources available and disseminated through relevant channels. Both in the case of the RCN and OsloMet, this is a result of more local engagement.

8.7 Incorporation of AIRR dimensions

AIRR dimensions are not as an integrated concept (under the label of RRI) promoted in Norwegian research policy. As has been pointed out in earlier chapters, elements of these dimensions are found in both national and organisational policy and practice, for instance diversity and openness. Value reflexivity can also been seen as a characteristic of research ethics. Science for sustainability and innovation, and science for solving grand challenges, are established framings of science policy which to a certain extent capture the philosophy behind AIRR, namely that the science system must open up to societal needs and values and leave behind elitist scientists in ivory towers without touch of the real world and real people’s concerns. However, the excellence agenda is equally strong as the agenda for impact and societal challenges - and indeed came back with a vengeance in the follow-up of the Productivity Commission in 2017. In Norway, as also abroad, there is a tendency to unduly polarise the distinction between excellent and socially oriented research.

When it comes to the individual AIRR dimensions, it can be observed that the RCN has repeatedly been praised for its inclusion of the RRI framework in the Division for Innovation in general, but more specifically in the BIOTEK 2020 programme and the Centre for Digital Life. However, it has also repeatedly been criticised for the way funded projects actually treat the RRI process dimensions. As scientific excellence will also trump the quality of the RRI design of the project, a number of funded projects treat the dimensions in a very superficial way. Currently, the RCN funded a dedicated RRI project to assist the Digital Life projects in the RRI work. However, the situation is still that few of the funded projects show signs of transformative change in the way they conduct research. Assumedly, this is because they fail to see the need for such radical change in the science system. Such an argument has yet to be established in the mainstream scientific culture in Norway, including at the policy level.

185 https://www.digitallifenorway.org/prosjekter/res-publica
This also explains the lack of systematic AIRR work at OsloMet. Even if several of the AIRR dimensions relate to established values at OsloMet, it does not exist as an integrated concept. From the national RRI workshop organised in February 2017 with national stakeholders in the research and innovation system, it appears that this is the situation in most research and innovation conducting organisations in Norway. However, all organisations express positive attitudes to RRI and AIRR, so there is the potential to further develop this line of thinking, - even if one may doubt whether many of the stakeholders perceive the current organisation of the science system as being in crisis and in need of radical change. The AIRR dimensions do not need to be interpreted in such a radical way in order to improve the social responsibility of research and innovation in an incremental way.

8.8 The integrated or fragmented nature of different responsibility related aspects

We find that the observations from chapter 5 on the fragmented nature of the different responsibility related aspects also hold at the organisational level and do not have additional observations other than point out that this – unsurprisingly - is consistent across levels.

9. Conclusions

9.1 Discussion

In this report we have given an account of how RRI and the keys are understood and developed in practice both in the national discourse and in two organisations specifically.

It should be noted that we have been actively involved in both organisations as action researchers and one of the organisations is indeed our own employer. In this sense, we may not have a fully objective perspective on the organisations. It should be born in mind when reading the report that there might be critical perspectives we have failed to acknowledge because we have been too intimately involved. In our view, this is acceptable, as it is clear that we have not conducted a neutral evaluation; we have conducted a review with the intention of identifying areas of improvement and to motivate the organisations to actually carry out such improvements. This is both the strength and the weakness of this report.

Even if we have been intimately involved with the organisations we have studied, we still believe that it is quite accurate to state that the organisations represent several best practices. Indeed, in the work with the RCN we have collaborated with an organisation that is among the world leaders in promoting RRI. As such, our contribution has been modest. With regard to OsloMet, our contribution has been more substantial when it comes to the concept of RRI, but also OsloMet has been implementing best practices on several of the RRI keys long before the RRI-Practice project.

We have two final observations that might be of interest. One is to note the different ways organisational change processes have impacted on the project’s review and outlook work. In OsloMet this change process has created a window of opportunity for an RRI profiling of the new University. In the RCN, the organisational change process has yielded uncertainty as to the further deployment of RRI in RCN.

The other is to note an important lacuna in the analyses in this report, - reflecting a significant challenge to RRI. As we saw in chapter 4, a significant share of Norwegian research is conducted in private enterprise and in the public health enterprises. These are not as readily exposed to the RRI agenda through the EU or the RCN. As there are few national policy signals that RRI is important, it is less clear how the RRI agenda can reach these important actors. This is not to say that these actors don’t take ethics (or gender, etc.) seriously, but they seem to have a more peripheral position in the RRI discourse.
More focus on RRI in such research and innovation system actors should thus be given. In addition, there are other important actors in the research and innovation system that have not been addressed here, such as Technology Transfer Offices (TTOs), standards agencies, regulatory agencies, advisory committees, etc. It has been outside the scope of the RRI-Practice project to address questions regarding RRI in such actors, but if you take a more comprehensive systematic approach, this should be done.

The project has had an immediate impact on OsloMet, as University management has adopted an RRI policy and we have been asked to provide resources for education and training. With regard to the RCN, the impact is perhaps more ambiguous and more intertwined with actions they would have conducted in any case. However, we hope that we also in the RCN have contributed with interesting analyses and spurred new reflections.

The work has in itself yielded important insight into the implementation of a policy concept into an organisation. Based on this, we will now outline some recommendations to target groups.

9.2 Policy recommendations to national policy makers

Including RRI in national research and innovation policy

This report shows that several aspects of RRI are reasonably well implemented in national policy and organisation policy and practice in the RCN and OsloMet, more specifically, research ethics, open access and gender equality. In these areas there is regulation or explicit policy signals. Inferring from this; if there are concerns about potential diminished trust in science in the Norwegian population, national policy makers should consider strengthening a national program for science education and emphasising stronger the importance of societal engagement in science policy.

There is no basis in the current report for concluding that connecting different science policy agendas, like gender equality, ethics and open access, into one umbrella concept contributes to strengthening the outcomes of these agendas. We therefore refrain from making such a recommendation with regard to RRI as a bundle of five (or six) keys.

Arguments have been made, for instance by the Transformative Innovation Policy Consortium, that the current science system is unable to address societal grand challenges. Schot and Steinmueller (2016) argue that the challenges we face globally require a breaking down of ivory towers, increasing the interaction between universities, private companies, NGOs and the public in collaborative and co-creation networks that draw on different kinds of skills and competences and provide immediate impact from public investments into research. If this diagnosis is shared, national policy makers can strengthen the support for RRI as a framework of inclusive, anticipatory, reflective and responsive research and innovation in national science policy work. Such policy signals will be picked up by organisations in the national policy systems, and can also function as best practice for other countries. Norway already has a position as a best practice country in RRI because of RCN’s RRI framework, our Gene Technology Act, our Patent Ethics Advisory Board, etc., and national policy makers can choose to consolidate this position.

Consider RRI friendly research assessment models and incentives

A common barrier to RRI seems to be that excellence and publication points are monitored and rewarded more than RRI activities. If national policy makers would like to promote Open access and Open science, societal engagement and broader transdisciplinary processes for societal problem-solving,

a reconsideration of assessment models and incentives is in order. The Result-based Redistribution (RBO) funding for the higher education sector can be adjusted to reward RRI-related activities. This again will influence the incentive systems within the institutions. Such a revised incentive system may also have direct positive effects on research integrity specifically, as there is an assumed link between publication pressures and research misconduct.

9.3 Policy recommendations to European policy makers

The RRI concept should not be too explicitly defined in terms of keys

Norway is best practice in some key areas (research ethics, open access and gender equality). As such, the level of ambition of the EC is too low. In the Norwegian context, it is reasonable that the ambition for the ethics key relates to a much more sophisticated concept of ethics than research integrity and a minimal research ethics. Moreover, in Norway, the challenge now is to implement diversity policies, not isolated gender policies. Finally, in Norway, the Open access agenda is superseded by the broader Open science agenda; it thus does not make sense to request implementation of Open access policies specifically. However, Norway can probably learn from the EC with regard to addressing societal engagement and science education. The implications of this is that when the European Commission wants to implement RRI, it should take into account the cultural and development contexts. This means that the EC probably should be cautious about specifying too explicitly what RRI is to contain. In addition to the keys, the EC advocates an overall RRI philosophy: ‘RRI is an approach that anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation’\(^\text{187}\). This concept is more likely to function as an RRI framing that is relevant in all countries. Of course, most countries can agree that the RRI keys are important, but calling them RRI as a bundle is not likely to be effective.

Time must be given for RRI implementation processes to mature

If we disregard the RCN, which has already had an RRI policy for a period, and focus on OsloMet, which is new to RRI at the policy and practice level, we can see that even if the organisation is very positive to the concept of RRI, it takes time to implement this. If the organisation had expressed more resistance, even longer time would have been required for implementation.

The EC must take this into account and not discontinue the RRI agenda when it has finally started to gain momentum. With dedicated funding from the SWAFS programme, many organisations across Europe, and even globally, have started to invest time and resources into RRI. If RRI in FP9 is replaced with Open science, it will prove the sceptics right; that RRI was just a fad. Ultimately, such quick shifts will damage science policy in general; for instance, the Open science policy will itself be less credible. Open science has great potential to be emphasised as a part of RRI, not as an alternative.

9.4 Recommendations to research conducting and funding organisations

As RRI is not fully implemented yet in OsloMet, we cannot conclude on how successful it will be and whether this strategy should be followed by other research conducting organisations. Still, from the review of how OsloMet has succeeded in implementing RRI aspects there are several learning points. Moreover, the RCN has for at least five years had an explicit RRI perspective in the Division for Innovation and this implementation process can also inspire recommendations.

- **Find the right time to implement the RRI agenda.** In OsloMet RRI was introduced in a time of transformation, where organisational changes have led to a search for a new identity and possibilities for building a new culture. This has given a room for RRI. Organisational change

processes are not necessarily the right time for strengthening RRI, though, as they may make the organisational context more uncertain and complex, at least for a while.

- **The importance of champions.** The OsloMet study has revealed champions for both gender, ethics and open access and the RRI-Practice team has also functioned as champions for RRI, volunteering to help out in developing education and training material, etc. Likewise, the RCN study has shown the importance of champions for RRI as an integrated concept focused on learning. Building on or creating such champions is important for implementing RRI policy and practice.

- **Build alliances around strategic goals.** As described above, the RCN has adapted to a political governance context that emphasises societal challenges, sustainability and public awareness related to emerging technologies. While adapting to this context, it also had to face various program boards consisting of researchers and stakeholders from the different fields. These researchers and stakeholders have not always shared the government’s views on research or on the role of the RCN. When the RCN has been able to implement such an experimental program as the Digital Life Initiative, it is because of a broad involvement process where stakeholders, including the RCN itself, have been made accountable to each other. This has been necessary, not only to create buy-in to the concepts of RCN as a learning organisation, the RRI framework or Digital Life as an experiment, but also to effect cultural change in the communities of researchers surrounding the RCN. The RCN have picked allies and collaborators that have legitimacy and influence, not only in policy circles, but also in the research communities.

- **Be open and transparent about differences and conflicting understandings of the relation between science and society.** RRI is not a political program that everybody has to agree upon.

- **Develop RRI as a learning process.** This could be a process where the organization both reaches out to the surrounding institutions and reaches “in” to different parts of the organization where it could be constructive and useful to engage with RRI.

- **Develop arenas where staff – and in the case of funding organisations, applicants – can train on reflection, anticipation and responsibility pertaining to the relation between science and society.** This may prevent RRI and the keys being reduced to check-box activities.

### 9.5 Best practices scalable to European or national level

Earlier in the report, we have outlined a number of good practices, and we give a comprehensive summary of organisational best practices in annexes A and B below. Here, we will only emphasise some best practices worth particular attention.

**Based on the study of the national policy context for RRI in Norway we find especially these elements to be of interest in terms of best practice:**

- **Dedicated institutions.** Whereas many countries have national research ethics committee for medicine, a special case in Norway has been the establishment of national committees for social and humanistic sciences (NESH) and for natural science and technology (NENT), in addition to the one for medicine (NEM). The national committees were traditionally expert based, but NENT experimented early with methods for involving a broader range of societal groups.

- **An Act for Research Ethics.** Norway is also special as it has an Act for Research Ethics. The first Act was published in 2007: ‘Act no 56 About the treatment of ethics and integrity in research’. The purpose of this act was to contribute to the goal that public and private research is conducted in alignment with acknowledged ethical norms. The Act made it clear that it is the research organisations that have the primary responsibility for preventing and handling allegations concerning research misconduct, but also established the National Commission for the Investigation of Research Misconduct. Institutions may redirect an investigation to the Commission if, for example, a case is deemed particularly complicated, has received
considerable public attention or due to possible conflicts of interest. The Commission may also
decide to investigate a case under authority of the law on misconduct at its own initiative. The
Act was updated in 2017. The revision strengthens the responsibility of the research conducting
organisations with regard to education and training of research staff as well as for establishing
ethical guidelines and procedures for handling cases of alleged misconduct. All Norwegian
research conducting organisations are therefore in the process of strengthening these kinds of
procedures.

Based on our study of RCN we find that the following best practices are scalable to research funding
organizations at both European and national levels:

- **Dedicated, integrated programs with learning platforms.** The establishment and development of
  the programs IKTPLUSS, SAMANSVAR, BIOTEK2021 and NANO2021 support RRI not only in RCN
  but also in the research and innovation sector in Norway. The programs all put RRI and the
  societal challenges well on the research agenda, and place demands on the researchers involved
  in the program activities in terms of reflection, co-production and inclusion. The programs also
  function as important platforms of knowledge sharing and learning - a key dimension of RRI in
  RCN.
- **“IDÉLAB”,** a platform for ideas, anticipation and reflection where researchers from different
disciplines get together and start cooperating around specific challenges in order to come up
with concrete proposals for research funding.
- The establishment of the Center for Digital Life Norway (DLN). DLN is a national center for
  biotechnology education, research, and innovation. It is run as a collaborative project by the
University of Oslo, University of Bergen, and the Norwegian University of Science and
  Technology, supported by the RCN’s program on Biotechnology for Innovation (BIOTEK2021).
The activities at the center are organized in a governance and networking project, which
  includes a research school, and several research projects. The center facilitates transdisciplinary
  cooperation across institutions and fields of research, and between projects, with a specific
  emphasis on RRI.
- **A dedicated program on Gender Balance in Senior Positions and Research Management**
  (BALANSE).

Based on our study of OsloMet we find that the following best practices are scalable to research
conducting organizations at both European and national levels:

- **Science Ombud.** OsloMet has a Science Ombud under the Faculty of Health Sciences. The
  Faculty's Science Ombud advises and guides employees in research ethical issues. The goal is to
  have a good research culture and to prevent and resolve conflicts at the lowest possible level.
- **A dedicated course for students on Technology and Society with an RRI component.** As an effort
to intensify science-and-society components, OsloMet is developing a 10-credit English-speaking
  course on Technology and Society. The course will give students a general understanding of the
use of technologies in their professions as well as an awareness of the limitations and potential
  negative consequences technologies may have at work and for society.
- **Building up organizational culture with diversity as a value.** The diversity efforts are rooted in
OsloMet’s main strategy, Strategy 2024, and the Diversity action plan. According to these
documents OsloMet’s organizational culture, structures and processes should be organized in
  such a way that OsloMet as organisation benefits from diversity. In fact, Strategy 2024 highlights
“diverse” as one of three core values that guide organizational development. In 2016, the
OsloMet’s Board decided for the first time to grant an earmarked strategic fund to the
organizational diversity work. This strengthened the basis for diversity work. The fund is to
  follow up and monitor the results in OsloMet’s diversity projects. Integrated in this effort is
diversity management training for management and other employees. This is a free offer of
competence and career development initiatives to all employees at OsloMet.
• Incentives for OA. In the first years of OA-practice, OsloMet (then HiO) used a reverse incentive scheme to promote green OA. If researchers had not self-archived their publications, their institutes would receive less money for this publication. In this way, OsloMet’s central administration delegated responsibility for improvement of the practice to the level of institutes. The economic interest made institutes’ management more proactive in follow-up of self-archiving. In this way it was no longer enough that academics published in journals and books for institutes and faculties to increase the “academic publishing”-dimension in their budgets. They had to secure that publications were made open by assisting employees in self-archiving. This type of incentive was marked as best practice at the national level and is suggested as a national measure to promote OA-practice in Norwegian higher education sector.
Best practices of ethics:

*Ethical Guidelines for research*

OsloMet has Ethical Guidelines for Research. In addition, there are Ethical Guidelines for Supervision and Ethical Guidelines for International Cooperation Agreements.

Ethical Guidelines for Research[^1] are dated 2014. They are based on the Norwegian legal documents for research ethics. They introduce OsloMet’s approach to some aspects of research integrity by listing values defining “good scientific practice” at OsloMet, specifying responsibility for research ethics in different parts of the organisation, taking up OsloMet’s standpoint on scientific misconduct, co-authorship, protection of research subjects and contract research. They also briefly address some ethical aspects concerning science and society such as global responsibility, protection of the environment and protection of animals. This extended view on research ethics accentuating science-society relations is rather vague and could to a larger degree benefit from and build upon OsloMet’s values, its role as a societal actor as well as its ambitions in technology, research and innovation.

*Research Ethical Committee*

Since 2011, OsloMet has had a Research Ethics Committee which is an independent advisory panel in individual cases relating to scientific misconduct. These are cases which are either submitted by the management or individuals or arise from conflicts or complaints relating to suspicion of breaches of scientific integrity and good scientific practice at OsloMet[^2]. In 2017, the committee got an extended mandate and shall now also assure that OsloMets’ practice in research ethics is in line with governmental policies and guidelines, advise on research ethics in case of on-going research projects, promote training in research ethics at all levels of OsloMet and propose measures that raise awareness of research ethical questions among OsloMet’s employees and students. The committee is led by an external member and has both external and internal members.

*Science Ombud*

OsloMet has a Science Ombud under the Faculty of Health Sciences. The Faculty's Science Ombud advises and guides employees in research ethical issues. The goal is to have a good research culture and to prevent and resolve conflicts at the lowest possible level[^3]. A science ombud position is proposed at the level of central research administration.

*Formal procedures for dealing with individual cases related to scientific misconduct*

[^1]: Ethical guidelines for research at Oslo and Akerhus University College of Applied Sciences, issued by rector on 09.10.2014: [https://tilsatt.hioa.no/documents/585743/53632647/Ethical+Guidelines+for+Research/ead56ba5-f2d2-4941-9bdc-c183ea77ec4d](https://tilsatt.hioa.no/documents/585743/53632647/Ethical+Guidelines+for+Research/ead56ba5-f2d2-4941-9bdc-c183ea77ec4d), Accessed 13.01.18

[^2]: HIOA’s intranet-page on research ethics: [https://tilsatt.OsloMet.no/en/research-ethics](https://tilsatt.OsloMet.no/en/research-ethics) Accessed 12.01.18

[^3]: R & D support for employees at the Faculty of Health Sciences, intranet-page for OsloMets employees: [https://tilsatt.hioa.no/en/software-remote-assistance?p_p_id=101&p_p_lifecycle=0&p_p_state=maximized&p_p_mode=view&_101_struts_action=%2Fasset_publisher%2Fview_content&_101_assetEntryId=54060538&_101_type=content&_101_urlTitle=fou-st-te-for-tilsatte-ved-hf&inheri...false](https://tilsatt.hioa.no/en/software-remote-assistance?p_p_id=101&p_p_lifecycle=0&p_p_state=maximized&p_p_mode=view&_101_struts_action=%2Fasset_publisher%2Fview_content&_101_assetEntryId=54060538&_101_type=content&_101_urlTitle=fou-st-te-for-tilsatte-ved-hf&inheri...false)
OsloMet has developed formal guidelines for dealing with individual cases related to scientific misconduct. The guidelines are developed and revised according to The Norwegian Act on ethics and integrity in research. Before cases are presented for the committee, there is a requirement that they are processed and maybe solved at the faculty level. Very few cases has been presented to the Research Ethics Committee in recent years.

A 10-credit course in Science and Technology for all students

As an effort to intensify science-and-society components, the Faculty of Technology, Arts and Design is developing a 10-credit English-speaking course Technology and Society. The course will give students a general understanding of the use of technologies in their professions as well as an awareness of the limitations and potential negative consequences technologies may have at work and for society. It will first be offered at OsloMets’ International Summer school 2018. The idea is however to make it available as an elective course for all bachelor students at the university no matter field of study.

Best practices of societal engagement:

*Establishing meeting places with the private sector (ex. Start Up Village)*

OsloMet is engaged in long-term cooperation with the private sector to develop further its innovation profile. One example is a new cooperation agreement with the Tøyen Startup Village (TSV). TSV is an office community that aims to promote innovation-based entrepreneurship in the local community. OsloMet has partnered with TSV to offer innovative workplaces and networks as well as an inspiring environment to employees and students. For OsloMet this practice is a way to facilitate innovation as a process of transforming the new knowledge being created at OsloMet into new products and services that are on demand in the local community and beyond.

*Engaging NGO representatives in research*

A research group at the Department of computer science at the Faculty of technology, art and design, has developed a practice of engaging NGOs in research. They organize “network seminars” where they invite representatives of different NGO organisations which represent different aspects of diversity (disabilities, elderly people, etc.). Such seminars have are several purposes: establish a good network, invite representatives of different user groups to tell about their challenges and then tell them what researcher can do so they can pair up solutions and challenges:

“It’s like a mutual benefit, we need them to participate in our research project, and we also report and solve real problems for them. So we see that this is important, because we are not solving imaginary problems, we are not only using them in our research, but we integrate them into our research. This is a mutually beneficial network. [...] If we develop things and the need come from them, we will use them in our iterations, to test the system and they give us feedback. And they

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194 Office at Tøyen Startup Village, internett-page for OsloMet students: [https://student.hioa.no/en/kontor-toyen-startup-village](https://student.hioa.no/en/kontor-toyen-startup-village), Accessed 17.01.18
also do acceptance tests for us. So they are entirely involved in our whole research process” (informant 18).

It takes time and dedicated research personnel to arrange such meeting as you have to make sure that the physical environment is accessible, and the information you send to them is readable, accessible and understandable. The research group also encourages students and researchers to volunteer in these organizations in order to gain better understanding of the users groups.

Establishing arenas for dialog between researchers, policy-makers and practitioners

OsloMet has a variety of regular seminars, conferences or other types of arenas where researchers meet practitioners and policy-makers.

Cultivating inclusiveness as a value in the organizational culture

To make research processes more inclusive in relation to external societal actors, some research environments work actively to cultivate inclusiveness as a value. This starts with engaging colleagues not directly involved in research projects in contributing with ideas and perspectives. Informants named a few practices that promote inclusiveness value in their environments:

- “Can you please read my research”? Contact academics you are not familiar with and ask for comments to publications’ drafts.
- Community-building lunches: informal arenas that take up different research related questions and invite to discussions on new perspectives, ideas, cooperation, and so on.
- Facilitation of co-writing of academic articles or anthologies with stakeholders, users or alternative experts.
- Engaging several research departments at OsloMet but also engaging other research organizations and stakeholders in development of research funding applications.

Action research at the Work Research Institute (AFI)

The Work Research Institute has a 50 years long tradition in conducting participatory action research, especially with industry, but also with the public sector. A number of inclusive methods are used at AFI, for instance dialogue conferences, search conferences, dialogue cafés, think tanks, etc.

Best practices of diversity:

Building up organizational culture with diversity as a value

The diversity efforts are rooted in OsloMet’s main strategy, Strategy 2024, and the Diversity action plan. According to these documents OsloMet’s organizational culture, structures and processes should be organized in such a way that OsloMet as organisation benefits from diversity. In fact, Strategy 2024 highlights “diverse” as one of three core values that guide organizational development. The strategy states:

Our location in the Oslo region gives us good opportunities to understand and benefit from the city’s diverse population. We will promote equality and understanding - in society in general and among our students and staff in particular.195

The Diversity action plan specifies the resource-perspective in OsloMet’s approach to the equality work:

Diversity is a central resource at OsloMet and we believe that our employees and students’ diversity in background and experience is a force in the development of research and education for a society and a region that is becoming increasingly diverse.\textsuperscript{196} Diversity as a core value is promoted through the educational offer to OsloMet-employees, OsloMet’s Cultural Council, Work Environment Council, and HR-network and is presented to new employees at Welcome day.\textsuperscript{197}

\textit{Diversity action plan}

OsloMet has established a practice of developing and following-up of the Diversity action plan. OsloMet’s second Diversity action plan for 2017-2019 was developed as an instrument to create an inclusive work environment by promoting diversity and preventing discrimination at the work place. The plan presents a description of the status when it comes to gender equality, ethnicity and disability, and lists a set of objectives and activities for a three-year period. The plan however is less specific about what problem there is to solve and how the activities are meant to be the answers.

One of the objectives in the current diversity action plan is to oblige faculties and centres to get more committed to the diversity work based on their particular challenges. This is an important step to promote diversity work and diversity further in the organization. Central HR prepares a common template and toolbox with research-based suggestions for diversity activities.

\textit{Dedicated personnel resources}

Since 2014, OsloMet has an adviser for culture, welfare and diversity employed in the central research administration. The adviser facilitates and follows up the organization’s efforts in diversity including development and follow-up of the Diversity action plan, leading a Diversity Committee, implementing diversity measures and engaging management in diversity related questions. The adviser is also engaged in OsloMet’s HR-network and promotes diversity related discussions in this forum.

The adviser position allocates only 30 % of the time to diversity related issues, which may be insufficient for such a big organization and efforts needed to monitor the problematic diversity issues and develop further practices in response to local challenges.

\textit{Diversity Committee}

In 2015, OsloMet launched its diversity committee, which is composed of representatives from all faculties and centres as well as students and administration. The committee serves as an advisory board for development of diversity related activities at OsloMet. The establishment of the committee is seen by the top management as “a right and important step towards establishing systematic diversity work at OsloMet”.\textsuperscript{198}

The committee’s mandate is to (1) prepare, implement and evaluate the two-year diversity action plan, (2) report on and analyse OsloMet’s work on equality, (3) contribute to strategic discussions and the

\textsuperscript{198} A diverse university, a blogg post by prorector for research Morten Irgens, date 30.10.15, https://blogg.OsloMet.no/mortenirgens/2015/10/30/a-diverse-university/?lang=en Accessed 12.01.18
work on defining goals at OsloMet, (4) be a driving force for an inclusive and non-discriminatory personnel policy, and (5) facilitate research dissemination and competence development in relation to diversity.\(^{199}\)

**Diversity management training for management and other employees**

To enhance diversity competence among employees and promote a culture of diversity and inclusion, OsloMet has developed several diversity-related courses for its employees within the “OsloMet academy”. This is a free offer of competence and career development initiatives to all employees at OsloMet. The example of courses are “Recruitment of diversity”, “Unconscious bias that prevents workplace diversity”, “Pink competence - How to act safely and inclusively in the workplace with regard to sexual orientation and gender identity?”, “Organizational culture and diversity”, and “Universal design of ICT”. In addition, OsloMet incorporates different aspects of “diversity management” into the program for developing further management competence for OsloMet’s managers at different levels.

**Own budget for diversity-related activities**

In 2016, the OsloMet’s Board decided for the first time to grant an earmarked strategic fund to the organizational diversity work. This strengthened the basis for diversity work. The fund is to follow up and monitor the results in OsloMet’s diversity projects.

**Diversity as topic in research and education**

Several research groups in different faculties and departments accentuate different diversity aspects in their research. Diversity is also integrated in different study subjects at the university.

**Hosting the national conference on gender equality at higher education institutions**

In 2017 OsloMet hosted the national conference on gender equality. The conference is a national tradition since 2005. It is meant for equality and diversity advisers, managers and HR at higher education and research institutions. The host institution sets up a theme and a program for the conference and thus promotes the most relevant and urgent discussions on the topic of gender equality. As a host for 2017 conference, OsloMet chose to challenge the participants with an idea of expanding institutional work from gender equality to diversity. The conference took up such topics as why expand gender equality; challenges in working with different grounds for discrimination as well as practices of diversity in organization and management.

**Best practices of open access:**

**Open digital archive at OSLOMET (ODA)**

Already in 2005, the Norwegian Association of Higher Education Institutions advised their members to create open digital publication archives. HiO\(^{200}\) developed its own OA-digital archive (ODA) in 2010, a few years behind other universities and higher education institutions in Norway (Holberg, 2013)\(^{201}\). Those years allowed the organization to contemplate on experiences with archives at other higher education institutions in Norway. In spite of the late set-up, OsloMet developed not only the archive

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\(^{199}\) A diverse university, a blogg post by prorector for research Morten Irgens, date 30.10.15, [https://blogg.OsloMet.no/mortenirgens/2015/10/30/a-diverse-university/?lang=en](https://blogg.OsloMet.no/mortenirgens/2015/10/30/a-diverse-university/?lang=en) Accessed 12.01.18

\(^{200}\) Those days, Oslo University College. It was before the merges.

itself but immediately secured routines and incentives for self-archiving which all together resulted in successful promotion and sustainable practice of green OA.

According to OsloMet’s OA-policy, staff and students should as a rule deposit their scholarly publications in Cristin (Current Research Information System in Norway). It is a national system for registering and reporting of research activities and results. From there, publications are transferred to ODA and then made accessible.

OsloMet’s internal policy on OA

OsloMet’s internal policy on OA was developed and decided on by the Board in 2011 and is to be updated in 2018. Following this policy document, OsloMet commits to promoting OA and making research results publicly available “to ensure free exchange of ideas in connection with the research at OsloMet”203. The policy introduces OsloMet’s technical infrastructure for OA and sets requirements for employees which primarily cover self-archiving in ODA. The document states:

The general rule at Oslo and Akershus University College is that students and researchers self-archive their publications in ODA. All peer-reviewed journal articles written by OsloMet staff members shall be made available in OsloMet’s Open Access digital archive “ODA” as soon as possible after being published, assuming that the publisher has agreed to the article being self-archived. Everyone must upload (deposit) their scientific articles in Cristin (OsloMet’s internal policy on OA, 2011).

According to the policy document, Green OA is mandatory. The policy to date does not explicitly set requirements concerning gold OA. However, the policy encourages scholars and students to choose publication channels with such OA:

HiOA shall facilitate so that students and researchers may choose the publication channels that provide the best access to the publication, either because the channel has a good policy for allowing self-archiving or because the publishing channel is an Open Access publication channel.

It also presents an opportunity to establish and run OA-journals based on OsloMet’s technical infrastructure and provides guidelines for it. Our interviews revealed that OsloMet employees are to different extents familiar with the policy. This may indicate that OsloMet is still in the situation where self-archiving is a well established and wide-spread practice, while OA in general and OsloMet’s range of OA-practices is less known and wide-spread among employees. An attitude-to-OA study among OsloMet-employees in 2013 made that same point (Holberg, 2013)204.

Technical infrastructure for OA-journals at OsloMet

OsloMet’s Learning Centre and Library offers a publishing solution for Open Access journals published by OsloMet. This includes the software (Open Journal Systems) and digital services that advise on how to start a journal, get access to the platform as well as help with setup, fixing issues, indexing, and support in other necessary ways. Digital services at OsloMet also provide import to the Directory of Open Access Journals, and provide Document Object Identification / Identifier (DOIs) from Crossref. Currently several Open Access journals are published originating from several academic environments at OsloMet,

202 https://wo.cristin.no/as/WebObjects/cristin.woa/wa/default?la=en, Accessed 04.01.18
for instance Nordic Journal of Social Research, InFormation and Research. The library’s publishing role is intended to complement the research communities that do not have an adequate open access journal option. The academic communities themselves must stand for all the editorial work (publishing related work) which might be very labour intensive. These journals are thus vulnerable to staff replacement.

**Dedicated OA-research administration resources**

OsloMet has developed an organizational structure that secures research administration resources to assist scholars in self-archiving their publications, in transferring those into OsloMet’s OA-digital archive and guidance on publishing in gold OA-journals. The structure includes a special adviser on OA in the central research administration and about 20 advisers in the research administrations at different faculties and research institutes that are Cristin-superusers. Cristin superusers’ focus is to provide guidance in how to register in Cristin. The research administration personnel also answer questions about where to publish and may help to find a suitable Open Access journal for a specific article if they need to.

Dedicated resources at each faculty and their coordination in a network for OA may be seen as one of the success criteria for OsloMet’s good results in the OA-area, compared for instance with placing OA-responsibility entirely with the library personnel. These advisers are close to the academics in their respective departments and institutes, academics are familiar with the advisers and their role, and the advisers can assist when required but also may remind and push for results when needed.

**OA-publication fund**

OsloMet has its own publication fund to promote and support publication of research results in full OA-journals, OA-books or open data repositories. The fund provides financial support to cover article processing charge, book processing charge or the storage of open research data. The fund is run by OsloMet’s central research administration which processes applications for funding on an on-going basis. It allocated approximately NOK 1 200 000 in 2017 and has been consequently growing since the year it had been set up (2013). The application form is very simple and mainly takes up requirements for financial support, required sum and the target journal/book.

**Focus on raising awareness**

To raise awareness of OA and the need for a transformative change to openness as well as to help academics to overcome insecurity and scepticism for a new practice, OsloMet had in earlier years of OA-practice put lots of efforts into spreading information about OA, answering questions and responding to concerns of employees.

Arguments for OA include impact, collaboration, quick publishing, keeping the copyright, promotion of democratic values, right to reuse and to generate new knowledge from existing research, faster access to new knowledge, access to materials that are not easily accessible (ex. Master’s theses, PhD theses), visibility of aggregated research in organizations, preservation and reputation.

This practice has been an important element in assuring a cultural change towards OA acceptance:

> *We found out that we need to use a lot of time to spread information first. So we made a tour to all faculties and departments and talked about OA, why to care about OA and how researchers can contribute to make their articles publicly available. We chose to do so because there was a lot*

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205 [https://journals.hioa.no](https://journals.hioa.no), Accessed 04.01.18
of criticism to OA among researchers to begin with. So we kept answering questions and kept explaining why OA was important. At the end, the resistance decreased (Informant 10).

Making clear why choose open access is one example of this type of practice. OsloMet promotes the importance of OA as follows:

*Why Choose Open Access? Because you through the removal of access barriers will enrich and accelerate research. Because researchers in poorer institutions and poorer countries should not be kept out. Because publishers should not be able to make huge profits from research, peer review and editing of work done free of charge by academics. Because we will not have to pay twice for publicly funded (and potentially crucial) research, first through our taxes and then through subscriptions and fees to commercial publishers of scientific journals*.

Other “-awareness-raising activities” included giving talks on OA at different faculties and institutes, finding “OA-ambassadors” at faculty/institute levels, and lobbying for OA at top management. In sum, it was a proactive and systematic effort to secure a culture shift over time.

An attitude-to-OA study at OsloMet in 2013 highlighted these efforts as success factors that led to raising awareness to OA and self-archiving as well as promoted a cultural shift in the organization towards acceptance of OA (Holberg, 2013). This can be inspiration for a transformation toward RRI in general as well.

**OsloMet’s internet pages on OA**

As an important step in the raising awareness campaign, OsloMet has developed internet-pages for OA which are both approachable through intranet and via OsloMet’s official internet-resource, both in Norwegian and English. These pages provide detailed information on what OA is, why choose OA-publishing, OsloMet’s internal policy on OA, OA’s policies of main national and international research funders, how to publish OA and how to get funding for publishing in OA as well as how to get in touch with OA-research administration resources at both central administration and faculties.

**Incentives**

In the first years of OA-practice, OsloMet used a reverse incentive scheme to promote green OA. If researchers had not self-archived their publications, their institutes would receive less money for this publication. Norwegian higher education institutions are driven based on result-based incentives from the government where results in academic publishing is one of the elements. By introducing an internal reverse incentive scheme to promote the practice of green OA, OsloMet’s central administration delegated responsibility for improvement of the practice to the level of institutes. The economic interest made institutes’ management more proactive in follow-up of self-archiving. In this way it was no longer enough that academics published in journals and books for institutes and faculties to increase the “academic publishing”-dimension in their budgets. They had to secure that publications were made open by assisting employees in self-archiving.

This type of incentive was marked as best practice at the national level and is suggested as a national measure to promote OA-practice in Norwegian higher education sector.

**Best practices of science education:**

*Program for outstanding research communication*

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Since 2014, OsloMet has a program to enhance researchers’ skills in media communication. The idea behind this practice is to provide necessary skills to enable more researchers to participate in the community debate and popularize their own research. The program goes over two semesters and has courses and skills training in presentation techniques, use of digital and social media, writing chronicles and practical media training.

**Participation in National Research Days**

Researchers from OsloMet participate yearly in the National research day organised by the Research Council of Norway (more information in chapter 7).

**Expertise centres based at OsloMet**

In cooperation with other societal actors, OsloMet serves as a base for several competence centres such as the Work Inclusion Expertise Centre, Expertise Centre for Profession Studies and National Centre for Multicultural Training. The role of different expertise centres is to strengthen knowledge development and knowledge dissemination in areas of importance for the particular topics of expertise. The centres work closely with private and public organizations to secure competence raising in the areas of their responsibility.

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208 Program for framgradende forskningsformidling 2016; https://tilsatt.hioa.no/documents/585743/54764075/PDF+-+program+for+fremragende+forskningsformidling/45bf8a06-1cd7-44f4-83ea-5adf01440390 Accessed 17.01.18
Annex B. Description of the best RRI practices at RCN

Best practices of responsibility and RRI

- The establishment and development of the programs IKTPLUSS, SAMANSVAR, BIOTEK2021 and NANO2021 for the consolidation of RRI not only in RCN but also in the research and innovation sector in Norway. The programs all put RRI and the societal challenges well on the research agenda, and demand a lot of the researchers involved in the program activities in terms of reflection, co-production and inclusion. The programs also function as important platforms of knowledge sharing and learning - a key dimension of RRI in RCN.

- The establishment and development of platforms and arenas for learning like internal processes of competence diffusion, through cooperation with external experts like Richard Owen, Arie Rip or Roger Strand, and Ph.D.- and summer schools that explicitly put RRI on the agenda.

- “IDÉLAB”, a platform for ideas, anticipation and reflection where researchers from different disciplines get together and start cooperating around specific challenges in order to come up with concrete proposals for research funding.

- The establishment of the Center for Digital Life Norway (DLN). DLN is a national center for biotechnology education, research, and innovation. It is run as a collaborative project by the University of Oslo, University of Bergen, and the Norwegian University of Science and Technology, supported by the RCN’s program on Biotechnology for Innovation (BIOTEK2021). The activities at the center are organized in a governance and networking project, which includes a research school, and several research projects. The center facilitates transdisciplinary cooperation across institutions and fields of research, and between projects. The host institutions of the research projects at the center constitute the hub- and node-structure of the network.

- The processes of writing a framework for RRI. The ambition in RCN is to develop processes characterized by the AIRR-dimension. The processes of writing a framework document about RRI has in itself involved both anticipation, inclusion, reflection and responsiveness in the organization. A new framework document is under way securing that the ongoing process of learning is not stifled.

Best practices pertaining to specific keys

Ethics

- Projects funded by RCN must systematically include considerations on ethics. This may have a constructive and pedagogical positive effect on the researchers and the institutions applying for research funding by the RCN.

- The ELSA 1 and 2 programs and the current SAMANSVAR program, as well as funding in other big technology programs, have contributed to Norway having a substantial community of researchers and practitioners in applied ethics, ELSA and RRI.

Social engagement

User involvement is described and highlighted in national whitepapers and policy documents. For example, in the HelseOmsorg21-strategy that is supposed to enhance the accuracy in the formulations and developments of different measures and actions in the health sector. User involvement in research implies a form of citizen science with involvement of users (citizens, patients, companies, schools, municipalities etc.) in both the research work and in the processes of formulating research needs and concrete research questions. The overall aim is to obtain relevant and useful research through participation of users and user groups in research processes that affect themselves.
The users can contribute to:

- Identify important problems in need of research
- Identify factors that enhance or hinders participation in research projects
- Bring about new perspectives in both the analyses and in the interpretations of findings
- Give feedback on e.g. communication and dissemination channels
- Disseminate results from research in their communities

RCN requires user involvement in an increasing degree of the research project that they fund.

**Science education**

- Nysgjerrigper is RCN’s program for children and young people in Norway, especially pupils and teachers within primary and secondary education institutions. The program aims at getting children and young people to know what scientific research is and to make them consider working as researchers.

**Gender equality and diversity**

- The Initiative on Gender Balance in Senior Positions and Research Management (BALANSE)

**Open Access**

- RCN has a close and systematic dialogue with the research performing institutions in the sector. Through these dialogues RCN can exchange ideas and get feedback on their work pertaining to OA. According to an interviewee this makes it easier to avoid «...introducing requirements that make it more difficult to be a researcher».
- An important principle for RCN is to make the institutions co-responsible for OA as it is practiced in both research and innovation.
- Self-evaluation and self-reflection is an important part of the OA advisers’ and special advisers’ practice in RCN.
- Open Access and Open Science is seen in connection, not as separate tasks. This makes the transformation from working with Open Access to working with Open Science smoother and more intelligible even if Open Science introduces the organization to many broad, profound and challenging questions.

**AIRR**

See descriptions of best practices of responsibility and RRI (above).
Table 1. Analysis of the ethics-key

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<tr>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
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<tr>
<td><strong>Current organizational practices</strong></td>
<td>Ethical Guidelines for research;</td>
<td>Governmental policies and the legal framework;</td>
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<td>Research Ethical Committee;</td>
<td>Guidelines developed by the Norwegian National Committees for Research Ethics.</td>
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<td>Science Ombud;</td>
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<td>formal guidelines for dealing with individual cases related to scientific</td>
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<td>dishonesty cases.</td>
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<td><strong>Potential drivers for the ethics-key</strong></td>
<td>New overall strategy (Strategy 2024) underlines development further of</td>
<td>The terms and conditions set out by external sources of funding, such as RCN</td>
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<td>research for solving the challenges of tomorrow and development of training</td>
<td>and EU’s Horizon 2020.</td>
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<td>programmes aimed at improving the competence of the staff.</td>
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<tr>
<td><strong>Potential barriers to the ethics-key</strong></td>
<td>OsloMet’s guidelines to research ethics reflect to a little extent on science</td>
<td>Ethics in RRI interpretation (science for society) is to a lesser degree reflected in</td>
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<td></td>
<td>and society aspect (ref. to RRI-definition of ethics);</td>
<td>National guidelines (except for NENT).</td>
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<td>scarce administrative resources devoted to ethics.</td>
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<td><strong>Most important potential organisational actions</strong></td>
<td>Revision of OsloMet’s Guidelines for research ethics to incorporate science and</td>
<td>Continue and expand participation in networks for interchange learning on ethics</td>
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<td>society aspect of research ethics;</td>
<td>(e.g. workshops and training provided by the European Universities Association)</td>
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<td>more personnel resources to advice on and develop practice in ethics at OsloMet;</td>
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<td>to the adviser on RRI.</td>
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<td><strong>Indicators for success</strong></td>
<td>Systematic training in research ethics; raising awareness among academic staff</td>
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<td>by means of available e-learning courses; develop a local internet/intranet</td>
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<td>resources; research ethics as a part of management competence development</td>
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<td><strong>Potential indicator for improved performance</strong></td>
<td>Updated Guidelines for research ethics that incorporates science and society</td>
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<td>aspect; more personnel resources devoted to promoting RRI.</td>
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<td>management competence development program.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of employees received training in research ethics;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>perception indicators measuring awareness of organizational work on research</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ethics and perceived ethical/unethical behaviour.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Analysis of the societal engagement-key
<table>
<thead>
<tr>
<th>Aspects of organisations</th>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication office; arenas to meet different types of stakeholders.</td>
<td>Cultivating inclusiveness as a value in the organizational culture (however still fragmented)</td>
<td>Different stakeholders involved in research processes (the practice is fragmented and not monitored)</td>
<td></td>
</tr>
</tbody>
</table>

**Potential drivers for the societal engagement-key**

OsloMet’s Communication policy which appeals for participation in public debate and dialogue with different stakeholders.

Individual researchers and research environments practicing public engagement and inclusiveness can provide both inspiration and tools for promoting more diverse and inclusive research at OsloMet.

EU requirements and particular RCN calls for research funding that promote RRI in general and public engagement in research in particular.

**Potential barriers to the societal engagement-key**

Lack of normative and administrative structures that promote societal engagement; Lack of incentives.

Insufficient and fragmented competence in societal engagement among academic and administrative staff.

Societal engagement in research processes (beyond science communication) is not highlighted aspect of responsibility in research in any of national policy documents.

**Most important potential organisational actions**

Establishing a devoted office and staff to facilitate practice of SE in research; Highlight PE in research in both R&D-policy and communication policy. Develop indicators and tools to monitor practice of SE.

Provide training on SE in research for academic and administrative staff; relate SE to responsibility in research; rewarding the researchers’ involvement.

Search for advice and inspiration on SE practices at other universities and other organizations such as NFR, science museums, NGOs etc.

**Indicators for success**

Societal engagement in research is explicitly articulated in policy documents

More researchers aware and practicing SE; increasing over time number of SE activities.

**Potential indicator for improved performance**

Established administrative structures for SE (policy documents, dedicated staff, tools to monitor practices, etc.);
Number of researchers involved in SE in relation to total number of researchers (changing of the ratio over time);
Number of researchers rewarded for SE.
Number of SE-activities (over time);
Number of OsloMet employees attending training initiatives on SE;
Number of people involved (by socio-demographic variables).

### Table 3. Analysis of the gender/diversity-key

<table>
<thead>
<tr>
<th>Aspects of organisations</th>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender balance measures are incorporated into a broader scope of diversity measures; the diversity action plan; 0,35 position in central administration devoted to diversity work; diversity committee; own budget for diversity-related activities.</td>
<td>Follows a mainstream-approach; builds up organizational culture with diversity as a value; diversity management training for management and other employees; mentor programme to secure position advancement for representatives of diversity; diversity as topic in research and education.</td>
<td>The Ministry of Education’s national indicators and early reporting routines on gender equality at HEIs. OsloMet’s diversity work is also inspired by recommendations from the Norwegian Committee for Gender Balance and Diversity in Research (KIF). OsloMet serves as a facilitator for promoting the extended equality concept in the Norwegian higher education and research sectors.</td>
<td></td>
</tr>
</tbody>
</table>

**Potential drivers for the gender/diversity-key**

Established structures; Rector with an interest in gender equality issues in academia

Established trainings for employees on diversity issues; OsloMet research on diversity issues; diversity as a subject in educational programmes.

The new Equality and Discrimination Act supporting OsloMets’ extended approach to diversity. The chosen mainstream-approach to the diversity work is
advised by LDO, the Norwegian ombudsman for gender equality and anti-discrimination. Funding organizations requirements to reflect on gender balance issues in applications.

| Potential barriers to the gender/diversity-key | Limited administrative resources; No ear-marked budgets for diversity work at the level of faculties and centres. | Little is known about competence in diversity management among managers at different levels at OsloMet as well as barriers for them to prioritize and practice diversity management on a day-to-day basis. Little statistics and no review of diversity challenges at the level of faculties and centres. Little knowledge among researchers about how the gender/diversity dimension can be addressed in applications to NFR and EU. |
| Most important potential organisational actions | Consider appointing diversity advisers at the faculty level. Increase budget allocations for diversity work at the level of the central administration and assure there are ear-marked budgets for diversity work at the level of faculties and centres. | More internal research to identify and better understand OsloMet’s challenges in diversity work. Develop tools to monitor different aspects of diversity related challenges and results of diversity work at OsloMet. Develop and implement measures to increase proportions of women in male-dominated fields of science and men in women-dominated fields of science. Provide training activities on the inclusion of gender/diversity dimensions in the context of research and teaching. Get insights from universities abroad to develop or adopt: - training activities on the inclusion of gender/diversity dimensions in the context of research and teaching - tools to monitor different aspects of diversity - measures to increase proportions of women in male-dominated fields of science and men in women-dominated fields of science. Provide recommendations for developing further national policies for diversity work in academia. |
| Indicators for success | Secured personnel and budget allocations for diversity work at faculties/centres. | Increased awareness of diversity and need for more inclusive research practice. |
| Potential indicator for improved performance | Perception indicators (to be measured annually through questionnaires), for instance: awareness of the impact of stereotypes and unconscious bias on diversity in science; barriers for inclusion; understanding of the diversity dimension in research, etc. | % of women/representatives of diversity in decision-making bodies, incl. advisory committees, expert groups, recruitment and promotion boards (annual evaluation); % of representatives of diversity (country of birth/migrant status, disability) in relation to different academic positions and fields of science (annual evaluation); % of men/women that are principal investigators on a project (annual evaluation); % of men/women that are first (corresponding) authors on research papers/publications (annual evaluation). % of research projects including gender/diversity analysis or considering gender/diversity dimensions (annual evaluation, out of total n. of projects). % of women in top academic positions, in general and at the faculty level (existing indicator); % of women of all employees (årswerk) (existing indicator); % of women in academic positions (existing indicator); % of women in technical and administrative positions (existing indicator); % of women in different positions (existing indicator); % of women and men among students, in general and at the faculty level (existing indicator); women/men salary rate in different positions (existing indicator). |

Table 4. Analysis of the open access-key
<table>
<thead>
<tr>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current organizational practices</td>
<td>Focus on raising awareness; openness as an organizational value.</td>
<td>Dissemination of OsloMet OA-practice both nationally and internationally</td>
</tr>
<tr>
<td>Internal policy on OA; dedicated OA administrative resource; OA-publication fund;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OsloMet’s internet pages on OA; technical infrastructure for OA-journals; incentives (used in the earlier phase of practice).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential drivers for the open access-key</td>
<td>Developed culture for self-archiving of the publications.</td>
<td>Newly published National goals and guidelines for open access to research articles and the National strategy for access and sharing of research data.</td>
</tr>
<tr>
<td>Developed robust and well-functioning structure for advising on OA and archiving as well as technical infrastructure and funding for publishing in OA sources.</td>
<td></td>
<td>International movement for open access, EUs policy in this area and the impact it has on both national and international research-funding organisations.</td>
</tr>
<tr>
<td>Potential barriers to the open access-key</td>
<td>Researchers’ careers are still assessed based on high impact rather than OA publishing, also for internal promotion.</td>
<td>Academic publishing industry; the way evaluation panels (e.g. in research-funding organizations) rate applications based on where a scholar has previously published.</td>
</tr>
<tr>
<td>Awareness of gold OA-publishing is not equally high in different disciplines and research environments; some environments are more conservative in regards to OA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most important potential organisational actions</td>
<td>Keep raising awareness about open science among OsloMet’s employees by informing/reminding of existing policy, activities, etc. and taking the topic up in research groups; by strengthening Cristin-super users competence in OA and later on open data</td>
<td>Contribute to developing national guidelines for OA and open science</td>
</tr>
<tr>
<td>Develop internal OA/Open science long-term/short-term strategy with targets, activities and indicators. Revise internal OA/Open science policy to also include guidelines for gold OA. Develop a set of internal indicators that help to reflect on the status and needs in OA field.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicators for success</td>
<td>Open science policy is developed</td>
<td></td>
</tr>
<tr>
<td>Potential indicator for improved performance</td>
<td>XX % increase in reported awareness of OA policies &amp; required practices in organisational surveys; by 20XX, XX% of researchers will comply with OA requirements. XX% increase in total annual allocation of funds to OA-publishing.</td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Analysis of the science education-key

<table>
<thead>
<tr>
<th>Aspects of organisations</th>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science education</td>
<td>Science education is neither a prioritized, nor visible activity. no formal structures for science education, no overview of the ongoing science education activities, but there exist established structures for science communication which can serve as a base for</td>
<td>Dissemination of research results and enabling “a greater number of academic staff to improve their capabilities as disseminators of knowledge” is one of the prioritized activities for the coming years according to the strategy. A general rule that research “results must be published in both academic and popularised form.</td>
<td>Participation in National Research Days; competence centers based at OsloMet; researchers contribute to the Science Center for school kids.</td>
</tr>
</tbody>
</table>
developing further science education activities.  
Science education activities are also a part of a few research projects. Engagement in science communication varies greatly at individual level and between disciplines. Program for outstanding research communication.

### Potential drivers for the science education-key

| OsloMet’s Communication policy which appeals for participation in public debate and dialogue with different stakeholders. | Individual researchers and research environments practicing SE can provide both inspiration and tools for promoting SE at OsloMet. Ambition to develop a PhD-course in RRI. RRI-research environments at OsloMet as a resource. | EU requirements and particular RCN calls for research funding that invite applications on or with components of SE, citizen science and science and society. The Norwegian Law on Universities and Higher education institutions that obliges universities “to contribute to disseminating results from research” and “facilitate the institution’s employees and students to participate in the community debate”. Governmental Communication Policy that accentuates “complicity” and «outreach» as main values in communication for employees of state-owned organizations. Market forces in contract research which press individual researchers and research environments to be seen and represented in public debate and by doing so market their competence for future contracts. |

### Potential barriers to the science education-key

| Lack of normative and administrative structures that promote SE; lack of incentives; Limited funding of science education activities; No formal pressures at the organizational level. | Insufficient competence in SE among academic and administrative staff. Lack of management focus on science education: Other more urgent issues and activities to prioritize. Cultural attitude among managers: science communication is personality-dependent, for those who have natural talent and engagement. | SE in research processes (beyond science communication) is not a highlighted aspect of responsibility in research in any of national policy documents. Competition for media attention. No formal pressures at the national level. |

### Most important potential organisational actions

| Establishing a devoted office and staff to facilitate practice of SE; Highlight SE in both R&D-policy and communication policy. Develop indicators and tools to monitor practice of SE. | Provide training on SE for academic and administrative staff Relate SE to responsibility in research. | Search for advice and inspiration on SE at other universities. |

### Indicators for success

| Established administrative structures for SE (policy documents, dedicated staff, tools to monitor practices, etc.) |  |

### Potential indicator for improved performance

| Number of researchers involved in SE in relation to total number of researchers (changing of the ratio over time); Number of researchers rewarded for SE. Number of SE-activities (over time); Number of OsloMet employees attending training initiatives on SE; |  |
Increase % of staff aware and practicing SE
Number of people involved (by socio-demographic variables);

Table 6. Analysis of the openness and transparency dimension

<table>
<thead>
<tr>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspects of organisations</td>
<td>The value is articulated in Ethical Guidelines for research, the main strategy, Communication policy, Open access policy; there are established structures and practice for OA; there are not structures and established organizational practices for open science.</td>
<td>Openness is rather well incorporated in the organizational culture at different levels. Open science and practice of openness is interpreted differently.</td>
</tr>
<tr>
<td>Potential drivers for the openness and transparency dimension</td>
<td>Openness is mandatory in OsloMet policy documents.</td>
<td>Openness as a cultural value of the Norwegian society.</td>
</tr>
<tr>
<td>Potential barriers to the openness and transparency dimension</td>
<td>Potentially conflicting values (integrity, impartiality and independence) are introduced in the OsloMets Ethical Guidelines for research.</td>
<td>Existence of some more conservative academic environments and more closed academic cultures.</td>
</tr>
<tr>
<td>Most important potential organisational actions</td>
<td>Transition in focus from OA to open science.</td>
<td></td>
</tr>
<tr>
<td>Indicators for success</td>
<td>Open science is introduced and formalised (see also table for open access key)</td>
<td></td>
</tr>
</tbody>
</table>

Table 7. Analysis of the diverse and inclusive dimension

<table>
<thead>
<tr>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspects of organisations</td>
<td>“Diverse” is articulated as the main organizational value in the strategy. However, it does not relate to research processes. No formal structures to pursue being diverse and inclusive as research process dimensions.</td>
<td>Diverse in terms of perspectives and inclusive in terms of involving different stakeholders is rather new.</td>
</tr>
<tr>
<td>Potential drivers for the openness and transparency dimension</td>
<td>Established structures for gender equality/diversity work in the organization.</td>
<td>“Diverse” as a defined organizational value (even if it does not reflect RRI thinking).</td>
</tr>
<tr>
<td>Potential barriers to the openness and transparency dimension</td>
<td>No formal pressures for change.</td>
<td></td>
</tr>
</tbody>
</table>
**Most important potential organisational actions**

| Articulation of diverse and inclusive along with other process dimensions in the policy documents, particularly an action plan for research. Ex. By extending meaning of learning and innovative values to reflect RRI-dimensions | Learning activities to design inclusive research projects for own scientific staff. | Seeking or initiating arenas for peer learning |

**Indicators for success**

| Inclusiveness is articulated value. | Competence raising activities implemented. | Peer-learning activities implemented. |

**Potential indicator for improved performance**

| XX number of employees reporting engaging in inclusive research. | XX % increase of reported awareness of this issue in our annual employee survey. | XX number of activities to collaborate or learn from other universities regarding inclusiveness. |

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**Table 8. Analysis of the responsive and adaptive to change dimension**

<table>
<thead>
<tr>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspects of organisations</td>
<td>No formal structures to pursue the dimension. Other values are articulated in the policy documents.</td>
<td>Articulated organizational values (“learning” and “innovative”) reflect to a large degree, but not intuitively, the meaning of the responsive and adaptive to change dimension.</td>
</tr>
<tr>
<td>Potential drivers for the responsive and adaptive to change dimension</td>
<td>“Being relevant for society” articulated in the strategy.</td>
<td>Research environments with traditionally strong ties to the market have a culture for responsiveness</td>
</tr>
<tr>
<td>Potential barriers to the responsive and adaptive to change dimension</td>
<td>No clear organizational approach for the practice</td>
<td>Researcher autonomy may limit will to adapt to external expectations. Incentives and academic career development may limit will to respond to societal input.</td>
</tr>
<tr>
<td>Most important potential organisational actions</td>
<td>Articulation of the responsive and adaptive to change dimension along with other process dimensions in the policy documents, particularly an action plan for research. Developing tools to monitor activities related to the dimension.</td>
<td>Building a culture for increased focus on societal values and expectations.</td>
</tr>
<tr>
<td>Indicators for success</td>
<td>Responsive and adaptive to change dimension is articulated in the policy documents.</td>
<td></td>
</tr>
<tr>
<td>Potential indicator for improved performance</td>
<td>% raised awareness of staff documented in staff surveys.</td>
<td></td>
</tr>
</tbody>
</table>

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**Table 9. Analysis of the anticipation and reflexivity dimension**

<table>
<thead>
<tr>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspects of organisations</td>
<td>No formal structures. No incentives.</td>
<td>No culture for practicing anticipation and reflexivity. No competence in methods and tools. No champions. Only sporadic anticipatory events.</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Potential drivers for the anticipation and reflexivity dimension</td>
<td>OsloMet policy addressing importance of research to solve societal challenges.</td>
<td>The role understanding of researchers includes research ethics reflexivity.</td>
</tr>
<tr>
<td>Potential barriers to the anticipation and reflexivity dimension</td>
<td>No formalised pressures to engage in anticipation/reflection</td>
<td>Informal incentive systems reward economic output/excellence/etc. effectively marginalising anticipation/reflection. Lack of competence to put anticipation/reflection into practice</td>
</tr>
<tr>
<td>Most important potential organisational actions</td>
<td>Articulation of anticipation and reflexivity along with other process dimensions in the policy documents, particularly an action plan for research. Appointing responsibilities to promote articulation of anticipation and reflexivity to an adviser in the research administration (such as the research ethics staff). Developing tools to monitor activities related to the dimension.</td>
<td>Learning activities to design good anticipation/reflection programs for own scientific staff.</td>
</tr>
<tr>
<td>Outcomes</td>
<td>There is dedicated resources to promote the dimension.</td>
<td>Competence raising activities implemented.</td>
</tr>
<tr>
<td>Potential indicator for improved performance</td>
<td>XX number of employees reporting engaging in anticipation/reflection. XX % increase of reported awareness of this issue in annual employee survey. XX number of activities to collaborate or learn from other universities regarding anticipation/reflection. XX % increase in projects that include specific (documented) anticipation/reflection activities.</td>
<td></td>
</tr>
</tbody>
</table>

Annex D. The matrices from The Research Council of Norway (RCN)

Table 1: Analysis of the ethics-key in RCN

<table>
<thead>
<tr>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current organizational practices</td>
<td>Ethics in RCN is to some degree about standards, principles and concrete guidelines for the research being funded over RCNs programs. This concerns vital aspects of research ethics that might be violated (consciously or unconsciously) by researchers during the research process. Important aspects here are</td>
<td>Research ethics and science integrity has been on RCNs agenda from the start.</td>
</tr>
</tbody>
</table>
transparency, impartiality and integrity that might be violated by misconduct related to cheating, fraud, plagiarism, fabrication and manipulation of data material and so on.

Potential drivers for the ethics-key

<table>
<thead>
<tr>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current organizational practices</td>
<td>The Research Council requires all scientific articles resulting from research wholly or partially funded by the Research Council to be openly accessible. All articles with such funding must be self-archived.</td>
<td>Dialogue with the institutions in the higher education and research sector.</td>
</tr>
</tbody>
</table>
In the period 2014–2019 the Research Council will implement a funding scheme to cover fees incurred by Norwegian research institutions for publication in open access journals. After 2019, the Research Council expects that costs related to publishing fees will be incorporated into the institutions’ indirect costs for R&D projects.

| Potential drivers for the open access key | RCNs mandate, KD (the ministry) and EU policy. | Openness and transparency is regarded as necessary elements in research projects being funded by public money. The (idea of the) taxpayers is a driving agent for OA. | Newly published National goals and guidelines for open access to research articles and the National strategy for access and sharing of research data. International movement for open access, EUs policy in this area and the impact it had on both national and international research-funding organisations. |
| Potential barriers to the open access key | Complexity is the most important barrier, caused by Open Access developing into Open Science | Even if OA is valued as an important dimension of publicly funded research activities it requires a lot of bureaucratic work. | The institutions are not forced to implement OA and take care of the implementation at individual researcher level. |
| Most important potential organisational actions | To collaborate substantially with the communication department in developing OA into Open Science. A group has been established across the divisions in RCN in order to develop a new Open science policy for RCN. | Open science is challenging, but at the same time a challenge integrating many of the goals and strategies of RCN. How to do Open science is a learning process that may strengthen the way RCN can be a responsible social actor. | The dialogue with the institutions. |
| Indicators for success | Committed institutions in the Norwegian science system. | Committed institutions in the Norwegian science system. | |
| Potential indicator for improved performance of the dimension in the research activities/progrannmes | A new Open science policy in RCN. | | |

Table 3: Analysis of the gender/diversity key in RCN

<table>
<thead>
<tr>
<th>Aspects of organisations</th>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCN has national responsibility for research policy-related activities to analyse and develop gender research, gender perspectives as well as gender equality in research. The Council is also responsible for initiating, implementing</td>
<td>Gender equality is a cultural core value in Norway.</td>
<td>The Ministry’s of Education national indicators and early reporting routines on gender equality. EU and OECD.</td>
<td></td>
</tr>
</tbody>
</table>
and monitoring research activities within this field. RCN tries to develop a framework for increasing the recruitment of women to subjects with a low percentage of women and develop initiatives to boost the proportion of women in tenured academic positions.

<table>
<thead>
<tr>
<th>Potential drivers for the gender/diversity-key</th>
<th>Gender equality is a core value in the organization but diversity is not yet fully developed. This may lead to innovation and learning in RCN.</th>
<th>National and international policies and reporting systems.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly competent advisers, and the fact that all researchers applying for research funding have to develop a gender perspective (in terms of substance and/or organization of the project) in their proposals in order to get funding. Gender equality is considered to be a core value of the Norwegian society and RCN can not signal a scaling down of its ambitions and activities pertaining to gender balance.</td>
<td>Gender equality as an RRI-key and gender equality as a historical political goal is not necessarily compatible. While gender equality as a historical political project is conflict oriented, RRI is harmony oriented. The understanding of gender equality in RCN reflects a conflict orientation. A gender- and diversity blind concept of excellence.</td>
<td>Gender equality issues are not really addressed as a matter of responsibility, but as a matter of political justice. This is not a barrier to gender equalit, but to gender equality in terms of RRI.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential barriers to the gender/diversity-key</th>
<th>Gender equality issues are not really addressed as a matter of responsibility, but as a matter of political justice. This is not a barrier to gender equalit, but to gender equality in terms of RRI.</th>
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<tr>
<td>Gender equality as an RRI-key and gender equality as a historical political goal is not necessarily compatible. While gender equality as a historical political project is conflict oriented, RRI is harmony oriented. The understanding of gender equality in RCN reflects a conflict orientation. A gender- and diversity blind concept of excellence.</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Most important potential organisational actions</th>
<th>A new programme, dedicated to gender and diversity.</th>
<th>A rethinking of the concept of excellence involving gender balance and diversity.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A new programme, dedicated to gender and diversity.</td>
<td>A rethinking of the concept of excellence involving gender balance and diversity.</td>
<td>The institutions address and work for gender equality and diversity on their own initiative.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators for success</th>
<th>More female project managers getting funding, more female professors.</th>
<th>More female project managers getting funding, more female professors.</th>
</tr>
</thead>
<tbody>
<tr>
<td>More female project managers getting funding, more female professors.</td>
<td>More female project managers getting funding, more female professors.</td>
<td>More institutions applying for BALANSE-funding.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential indicator for improved performance</th>
<th>More institutions applying for BALANSE-funding.</th>
<th>More institutions applying for BALANSE-funding.</th>
</tr>
</thead>
<tbody>
<tr>
<td>More institutions applying for BALANSE-funding.</td>
<td>More institutions applying for BALANSE-funding.</td>
<td>More institutions applying for BALANSE-funding.</td>
</tr>
</tbody>
</table>

Table 4: Analysis of the societal engagement key in RCN

<table>
<thead>
<tr>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspects of organisations</td>
<td>An increasing number of the research projects funded by RCN has user involvement as a mandatory element.</td>
<td>RCN’s mandate urges a development of engagement of the citizens (the tax payers) and science education of future generations.</td>
</tr>
<tr>
<td>Potential drivers for the public engagement key</td>
<td>RCN’s mandate, competent and dedicated individuals in the organization. An increasing number of the research projects funded by RCN has user involvement as a mandatory element. The development of a new Open science policy in RCN.</td>
<td>Relevance orientation of research projects. Open science.</td>
</tr>
<tr>
<td>Potential barriers to the public engagement key</td>
<td>The discussions about engagement and Open Science get reduced to a check box activity where researchers – in order to obtain funding – involve stakeholders on paper, but not in reality/practice.</td>
<td>Awareness, political mandate, competence</td>
</tr>
<tr>
<td>Most important potential organisational actions</td>
<td>A group has been established across the divisions in RCN in order to develop a new Open science policy for RCN. The Research campaign</td>
<td>Intensified dialogue about Open science and the consequences of it in and for RCN. Intensified dialogue on how public engagement can become part of the concept of excellence in research.</td>
</tr>
<tr>
<td>Indicators for success</td>
<td>RCN receives proposals from researchers applying for funding where public engagement are actual elements of their proposals, not just as a box to be ticked off in the application form.</td>
<td></td>
</tr>
<tr>
<td>Potential indicator for improved performance</td>
<td>A new Open science policy in RCN.</td>
<td>Public engagement becomes part of the concept of excellence in research.</td>
</tr>
</tbody>
</table>
Table 5: Analysis of the science education key in RCN

<table>
<thead>
<tr>
<th>Aspects of organisations</th>
<th>Structural issues</th>
<th>Cultural issues</th>
<th>Interchange related</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There is a department dedicated to communication and science education in RCN. There are resources, people and programmes dedicated to develop projects that communicate and educate on issues of science and research.</td>
<td>RCNs mandate urges a development of engagement of the citizens and science education of future generations.</td>
<td>Different stakeholders show interest in science education ranging from KD (the ministry), media like the national, public broadcaster NRK, to schools and museums. Science education is perceived as democratization of science and as an element in the development of a sustainable society. National and international policies pertaining to Open science.</td>
</tr>
<tr>
<td>Potential drivers for the science education key</td>
<td>RCNs mandate, competent and dedicated individuals in the organization. The internal work for a new Open science policy in RCN.</td>
<td>RCNs mandate and the transformation of OA into Open Science.</td>
<td>Politicians and educational institutions worrying that not enough young people will choose to become natural scientists or engineers.</td>
</tr>
<tr>
<td>Potential barriers to the science education-key</td>
<td>The discussions pertaining to science education and Open Science get too complicated and get reduced to communication about how important and exciting science is.</td>
<td>Science education gets confused with overload of information about the importance of science and great scientists. Citizens become scientists, but scientists still don’t see themselves as citizens.</td>
<td>Kids and schools get involved, but are mostly pushed in the direction of natural sciences. Institutions confuse engagement with bragging communication about their own scientific results.</td>
</tr>
<tr>
<td>Most important potential organisational actions</td>
<td>More collaboration between the advisers responsible for communication and the ones responsible for developing RCNs Open Science policy.</td>
<td>Intensified dialogue about Open science.</td>
<td></td>
</tr>
<tr>
<td>Indicators for success</td>
<td>RCN receives more proposals for funding were science education is an element.</td>
<td>More public debate concerning Open science and the role of the scientist.</td>
<td></td>
</tr>
<tr>
<td>Potential indicator for improved performance</td>
<td>More collaboration between the advisers responsible for communication and the ones responsible for developing RCNs Open Science policy.</td>
<td>More public debate concerning Open science and the role of the scientist.</td>
<td>More collaboration between schools and RCN.</td>
</tr>
</tbody>
</table>

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Annex E. Simplified organisational chart for the departments and divisions at OsloMet (dated 2016)

OsloMet

Center for Welfare and Labour Research (ca 200 staff)

Faculty for Health Sciences (ca 600 staff)

Faculty for teacher education and international studies (ca 450 staff)

Faculty for Social Sciences (ca 275 staff)

Faculty for Technology, Art and Design (ca 270 staff)
Annex F. Overview policy influences and early precursors to the current RRI strategy for RCN/BIOTEK2021

Introduction
This is a brief sketch of the trajectory what could be called a ‘policy shift’ that occurred in Norwegian research policy strategy and RCN research policy in the last 15 years. This shift implies a ‘societal turn’, based on a reading of white papers from various Norwegian ministries, and a subsequent document analysis of policy documents, strategy documents and program plans from the Division for Innovation at the Research Council of Norway.

This was done to better understand the trajectory that research policy in and around emerging technologies, and biotechnology in particular, has had on the way RRI has been implemented; both a policy ‘tool’ and an implementation strategy for responsible research and innovation at the RCN.

The purpose of this analysis was to establish a background for and also highlight the awareness and readiness that already was in place prior to the incubation of RRI-informed strategies in the strategic programmes BIOTEK2021 and NANO2021. The analysis builds on a reading of the platform that congealed around the concept of “robust technology development” established around 2008 in the strategic work in the ELSA, NANOMAT and FUGE programmes in the Division for Innovation. The overview emphasizes main objectives, focus areas, and tracks how ethics, societal responsibility and the introduction of ELSA-informed research evolved throughout the 2000s.

The overview is divided into two parts, tracking policy developments and priorities with particular focus on societal responsibility and ethical issues, culminating in the introduction of RRI-policies on the

1. Macro level (ministries white papers and national strategies for biotechnology and nanotechnology)
2. Meso level (Division for innovation, including NANOMAT, NANO2021, FUGE and BIOTEK2021).

Macro level/Bird’s Eye view: Policy influences; White papers and national strategies
This level provides an overview of the general policy influences and policy shifts that have impacted Norwegian research policy during the last 15 years, but also particularly policy shifts from a classical linear model towards a more “Mode-2”-informed approach, represented by the distinct shift in the 2008 “Climate for research” white paper, and culminating in the two national strategies for bio- and nanotechnology in 2012 and onward. The overview provides both a brief depiction of goals, objectives, measures and priorities, which inform the role of ‘responsibility’ in the RCN. Further it contextualizes RCN as a policy-actor, and the perceived role of societal responsibility for the research and innovation areas in various RCN programmes, and ultimately how the relationship between science and society is described. The general policy shift may be tracked as moving from a focus on expertise and excellence towards a more stakeholder-oriented and challenge driven orientation in policy. This analysis also point to a shift in how societal and ethical implications of science and technology is perceived symptomatic with the coining of the term “societally robust technology development” that emerged 2 years prior to the advent of RRI, and also how the term originated in the ministry strategies and white papers and not merely in the RCN.
Report no. 20 to the Storting; Commitment to research (2004-2005)\(^{209}\)

Main focus: research quality

Goal for the science and innovation system

“ensure that Norway occupies a leading position internationally in terms of new technology, skills and knowledge (Government inaugural address 2001). Clear priority towards quality and excellence and boost basic research. Strategy informed by emphasis on

Main objective: Success of research through external funding processes (EU framework programmes)

- Quantitative approach to quality; increase in publications
- Focus on researcher recruitment
- Focus on R&D in business and industry
- Focus on knowledge transfer from basic science to industry
- Signs of a deficit model: focus on knowledge dissemination to the public and increase in the legitimacy of research and science

Priorities research policy:

Structurally there is as an emphasis on stimulating Internationalization of research, fundamental research and research-based innovation.

Thematically, the emphasis is energy and environment, ocean, food, health.

Technology areas that are prioritized;

- ICT
- New materials nanotechnology
- Biotechnology

Role of Ethics and responsibility (p. 7-8)

Science is seen as value neutral, though seen as potentially subject to misuse

The paper emphasizes a need for ethical awareness in research and innovation. There is a clear focus on building ethical expertise through “professional ethics” and as a tool to enhance research safety and quality (emphasis on National ethics committees (RCN as evaluator).

The paper also suggests the establishment of a “comprehensive research ethics system”. Further, the Research Council will contribute to the “public research debate and will integrate the “precautionary principle in the work on research programs”. This is seen as addressed through ethics training and awareness of research institutions that are made responsible for addressing research dishonesty and ethics training for researchers and students.

RCN standard contracts will include a “checklists that emphasizes ethical issues.

Relationship between science-society

- A tendency towards a linear model of dissemination from Science to society (raising awareness and interest)
- Strengthen dissemination through university funding, RCN outreach towards science journalists, Science centers etc.

The concept of responsibility

There is a focus on research institutions’ responsibility towards research ethics and scientific conduct. RCN ‘responsibility’ is conceived as being “responsible for the entire spectrum – from fundamental research to innovation” (p. 10)

Report no. 30 to the Storting Climate for Research (2008-2009)

Main focus; Strategic research policy towards societal needs

It is observed that research and innovation unfolds in a complex interaction between different actors in the R&D and innovation system: “The linear development from basic research via applied research to the development of products and services in industry is rejected as a universal model. Modern research policy must relate to more floating borders between different sectors and different kinds of research.” (p. 66 of the Norwegian document, our translation).

Goals: Research policy will contribute to

- Meeting global challenges
- Better health and health services
- Addressing social challenges and provide research based practice in the relevant professions
- Knowledge based industry in all regions
- Increased industrial research in strategic areas (food, marine, maritime tourism, energy, environment, biotechnology, ICT and new materials/nanotechnology
- High research quality
- Well-functioning research system
- Increased internationalization of research
- Efficient use of research funding and results

Priorities (continuation from Report 20)

New direction and policy shift: Stronger emphasis on challenges in public sector and global perspectives (p.1)

- Annual budget focus on support of nine policy goals
- Focus on global challenges
  - Climate, derived from climate policy paper
  - renewable energy and carbon capture and storage, derived from the 2010 national budget, polar research, poverty and environmental issues.
  - Better health and health services
  - Addressing social challenges (welfare policy)
  - Focus on knowledge-based industry (Derived from White Paper on innovation (Report no 7 (2008-2009)- An innovative and sustainable Norway.

Industry oriented research in strategic areas

- Marine sector
- Tourism

210 https://www.regjeringen.no/globalassets/upload/kd/vedlegg/forskning/climate_for_research_final.pdf
• Maritime sector
• Energy and the environment
• Food, ICT biotech and new materials/nano

The “challenge-driven” orientation changed priorities in strategic programmes:

This change in priority changed initiated distinct shifts in how large strategic programmes in the Division for Innovation defined their strategy for proposals, focusing initially on renewable energy and environmental technology in NANOMAT, FUGE and the ICT programme:

“The Research Council’s large scale research programmes are an important instrument in many of these areas and will be continued. The already initiated escalation of research on renewable energy and carbon capture and storage plays an important role both in reducing future greenhouse gas emissions and in creating more environmentally friendly industries. In concordance with its White Paper on innovation the Government continues its work to increase funding of environmental technology.” (p. 3)

Evaluation and feedback as a policy-tool: Focus on a well-functioning research system.

• Focus on evaluating RCN, and its key role in the research system.
• High quality research
• Focus on excellence.
• Focus on internationalization
• Efficient use of research funding and results
• Focus on relevance and societal benefit for research, public availability, open access of publicly funded research.

Focus on responsibility or ethics

Law on research integrity and conduct implemented in 2007 lays groundwork for emphasis on responsible research, but still focusing on ‘classical’ research ethics

ELSA and societal responsibility or dialogue is not explicitly mentioned. However, the white paper engages issues of global challenges particularly, directly impacting new and emerging science and technology research and how such research became “challenge driven”. The origin of this shift came from the direct impact that the Climate agreement (2008) had on this white paper, where global challenges were reorienting science priorities towards renewable energy and climate technologies.

The Climate agreement also built on the 2008 agreement on climate policy, that was signed in connection with the consideration of Report no. 24 (2006-2007) to the Storting on Norwegian climate policy from 2007. This also informed the overall emphasis on sustainability in industry and marine industry in particular.

Goals:
Continue objectives from previous white paper on research (Climate for Research)

Policy targeted on 5 strategic objectives to meet global challenges
- Environment
- Climate change
- Oceans,
- Food safety
- Energy

The above are means to achieve “health” and “welfare” objectives
Health: Good health, reduced social inequalities in health, high quality health and care services.
Research based welfare policy:
Promote a knowledge-based industrial sector, encourage industrial development, particularly in sectors:
- Food
- Marine sector
- Maritime sector
- Tourism
- Energy
- Environment
- Biotech
- ICT and New materials/Nanotech

RCN’s role in meeting objectives
To succeed in reaching these policy objectives the RCN is used as a tool to foster:
- Well-functioning research system
- Research of high quality
- High degree of internationalization in research
- Effective utilization of research resources and results

Long term perspective for Norwegian R&D
Increase in research allocation and R&D investment for industry
- Long term focus and predictability and transparency in relation to national investment in R&D and higher education
- Promote active and public debate on investment in higher education and research and results
- Stakeholder-focus

211 https://www.regjeringen.no/contentassets/9f8d4da472c04edf8cabee3fed441b3d/engpdfs.pdf
Societal challenges focus beyond narrow sectoral boundaries

Central aspects of transition to a societal challenge-oriented focus

Climate change is emphasized as primary example of a ‘global challenge’ that informs research policy in Norway. To address societal challenges, research disciplines, institutions and authorities must move away from ‘silo-thinking’ and find solutions across traditional patterns of cooperation.

New focus on transparency and stakeholder involvement

Activities to draw up a long-term national plan for research and higher education will serve as an arena for open discussion on prioritization of resources; stakeholders are:

- Research sector/education sector
- Trade and industry
- Users of research

Transparency is understood as leading to greater predictability within sectors and ministry will focus on dissemination of priorities for all stakeholders.

RCN is said to have a central role in this initiative.

Transition from linear model to reciprocal flow of knowledge

- Between stakeholders (industry, society, research system)
- Educational communities, employee-driven innovation in contrast to hierarchical systems
- Importance of research ethics (p. 9)
- Enhance cooperation between research ethics communities and research and educational institutions, and focus on this internationally also
- Access to research results (Open access), publicly funded research to be publicly available

Role of the RCN

RCN must continue to refine its funding instruments and work methods to enhance quality. Work methods, instruments and procedures to be user-group adapted, strengthen knowledge base for advisory activities, increase strategic effort to promote independent research institute sector, university profiling and international cooperation.

Internationalization of Norwegian research.

Norwegian research to generate solutions to global problems in ‘strong’ areas

- Climate research
- Energy
- Food
- Natural resource management
- Social science

Ethics and the role of responsibility

Focus on responsibility not emphasized. Ethics as such mentioned in relation to research ethics.

Focus on increased H2020 participation
Thematic priorities: Seas and oceans that will boost research on

- Value creating for industries near coast
- Better management of ecosystems and resources
- Clean seas and healthy, safe seafood


This white paper shows clear shifts towards prioritization of interdisciplinary and cross-cutting research strategies, and illustrates a transition towards using the RCN in a proactive way to utilize resources and learning between disciplinary sectors in a more active way. Additionally, this white paper highlights ELSA- and social-science aspects of enabling technologies where understanding of co-production may be more prevalent.

Rising political interest in research investment

Increase in R&D of 1% of GDP /achieved 2019/2020 by scaling up 6 long-term priority areas:

- the oceans;
- climate change, the environment and environment-friendly energy;
- public sector renewal and higher quality, more efficient welfare, health and care services;
- enabling technologies;
- an innovative, adaptable private sector;
- world-class research groups.

3 overarching objectives for long-term plan

- To strengthen competitiveness and innovation capacity.
- To solve major challenges to society.
- To develop high-quality research groups.
  All objectives are interconnected

Focus on the value of interdisciplinarity

- RCN Idélab is mentioned (inspired by the EPSRC)
- UiO expert advisory group emphasized interdisciplinarity
- ‘convergence’ as a term for enabling technologies is explained

Climate, environment and clean energy

- Focus on adaptation to low emission society by 2050
- Focus on eco-friendly technology is highlighted through
  1. developing Norwegian tech to address global climate
  2. environment and energy challenges,
  3. change-over to low-emission society,
  4. better understanding of climate changes and good adaptation

5. Social development adapted to environmental considerations

Emphasis on multidisciplinarity and integration

Addressing climate change and environmental challenges by integration of commitment by both technical social sciences, technology and humanities in order to understand and handle effects of these changes and address them.

Prioritization of enabling technologies

Commitment to enabling (bio, nano, ict) tech through focus on Biotech exploitation in a responsible manner (p. 33)

- To secure value creation and health and safeguard the environment
- By cross-sectoral research, competence development and cooperation
- Bio- and nano-strategies form the technical groundwork for organization

Focus on ‘fundamental’ ELSA

The perception of the relevance of ELSA is directly connected to enabling technologies and articulates the need for ‘fundamental’ ELSA research:

“We need to integrate research on ethical, legal, environmental and social aspects of this commitment. Ensuring broad-based and critical research on the application of these technologies will require fundamental humanistic, social and legal research” (p. 33)

ICT strategy focus on addressing major social challenges, particularly information security in public sector, infrastructure and health care

Focus on “ethics” and responsibility; “responsible technology development

A distinct phrasing of ‘responsible technology development’ marks the precursor in the Norwegian policy context to what later has been labelled under RRI. This phrase emerged prior to RRI-informed prioritization and is characterized by

- Emphasis on ocean/marine research, enabling tech as informed by considerations to “responsible technology development”
- Focus on multidisciplinarity and “integration”; “convergence” and integration, policy as cross-disciplinary.

National Strategy for biotechnology (2011-2020)213

This strategy is marked by both technology optimism and focus on industry and value growth in combination with a clear intra-/cross disciplinary focus

Here the term “Robust technology development” is used as a further evolution of the term ‘responsible technology development’.

This is marked by issues such as:

- Research ethics, privacy, consent, confidentiality, reservation-registers

• ELSA focus more central
• BIOTEK2021 as a strategic programme
• The programme is seen as embodying an all-in-one focus, combining strategic calls on cross-cutting research covering ELSA, industry, competence-building, infrastructure.
• Cross-ministerial involvement in the strategy (6 ministries involved)
• Industry focus dominating the strategy

The strategy commits institutions to articulate ELSA-component in biotech research

This is viewed as unconventional and surprising by commentators and viewed as controversial by the various research communities (Etikkom.no)

Main priorities; Biotechnology will foster:

• New environmentally friendly industrial processes,
• Reduced pollution,
• Safer and more secure food
• More innovative health services
• Increased competitiveness for industry

The strategy has an overarching focus on mitigating risks

This is to be addressed by integrating Responsible innovation and cross-cutting areas.

Responsible research and innovation focus on:

• Ethics and regulatory measures
• Precautionary principle
• Societal dialogue

Strategy influences

The strategy was developed in dialogue with

• National institutions and advisory bodies
• BIOTEK2021/RCN
• Evaluation of FUGE

Considerations of ELSA is central and must be integrated ‘clearly’ into projects, programmes and initiatives and ‘not peripheral’ to technological development, but ‘central’. (p. 8)

The strategy identifies four thematic areas to address social challenges and competitive advantages:

• Aquaculture/Seafood/management marine environment
• Land-based food and biomass production
• Environment-friendly industrial processes and products
• Health, health services and health-related industries

Strategy vision:

The vision of the strategy evolves around cultivating cross-sectoral research, in a ‘responsible manner’ in order to strengthen value creation, improve health and safeguard environment.
The strategy articulates 8 focus areas where this vision is implemented:

These eight areas inform the strategy for the next decade and are divided into four thematic and four cross-cutting focus areas:

- Health, health services and health-related industries (best developed)
- Aquaculture, seafood and management of the marine environment (strong)
- Agriculture-based food and biomass-production (strong)
- Industrial biotech; Environment-friendly industrial processes and products (underdeveloped)

In these areas, there is a considerable ‘uncertainty focus’; precautionary principle informs responsible action from government, organizations, individuals, in open dialogue with stakeholders

Four cross-cutting (designed to ensure expertise used in responsible manner)

- Biotechnology and society
- Industrial cooperation
- Industrial development
- Competence and infrastructure

Interaction between cross- and thematic focus form cross-sectorial basis for industry, supporting interdisciplinary, and cross-sectoral projects. Competence building, optimizing innovation conditions, internationalization and ELSA is considered paramount for success in focus areas. Biotech is seen as enabling (in conjunction with nano- and ICT).

Focus on risk and unacknowledged dangers urges regulatory scrutiny

Ethical and societal issues is seen as potentially in conflict with other interests, such as value growth and competitiveness. These potential conflicts are to be mitigated through

- Risk and environmental research
- ELSA independent research
- Public debate
- Health technology informed by coordinated research on ELSA

“Biotechnology and society”:

The strategy has a focus on societal debate and uncertainties, unintended consequences, conflicting values between research, industry, society and environmental concerns

Particular activities under “biotech and society” that are to address these concerns are:

- Integration of research on ELSA
- Basic research in humanities, social sciences and law on biotech
- Independent research on risk biosafety and uncertainty
- Social dialogue and user participation

Commitment to “biotechnology and society” imply a focus on integration/interdisciplinary/cross-sectoral research and stakeholder cooperation.
The government’s strategy R&D strategy for nanotechnology 2012-2021

Influences and development process

Advisory expert group consisting mainly of research institutions and industry but also Roger Strand (ELSA expert), and representatives from the Directorate for Climate and Pollution. The NANOMAT evaluator report (Veien Videre (2011)) was used as a knowledge platform for the group. The strategy was derived from a series of dialogues with central institutions and actors in the industry alongside a conference with 150 attendees from institutions, organizations and public administration, where 14 written opinions were collected. Dialogue with the Norwegian Technology Board and RCN was also conducted.

Three main priorities:

- Develop basic knowledge
- Innovation and commercialization
- Responsible development

The aim of the strategy was to develop basic knowledge through international cooperation, including H2020 and promote safe development of nanotech by making the EU code of conduct for Responsible Nanoscience’s and Nanotechnologies research norm for national R&D. Further focus on involvement by Norwegian companies in H2020

Nanotech should contribute to increased competitiveness of Norwegian industry and better handling of societal challenges without unwanted effects on health, environment or society. National priorities are maintained through the NANO2021 programme.

Responsible technological development

This focus area will be promoted through

- Facilitation of an increase of publicly funded R&D efforts in HSE and ELSA research to a level which is among the leading internationally.
- Facilitate the integration of HSE and ELSA into technology development projects involving nanotechnology.
- Make the EU “Code” the norm for national R&D efforts.
- Cooperate with the Norwegian Board of Technology to increase the social dialogue and involvement of society in technological development within this field.

Timeframe of 10 years

Assessment will be ongoing, and budgetary adjustments will be undertaken annually.

Framing of ‘Responsible technology development’

Acknowledgement of the need for increased knowledge related to unwanted effects on health, environment and society. This includes frameworks for a safe, sustainable and ‘meaningful’ technology development on the nano-area. This includes increased focus on knowledge building on HES issues, including mapping of the industry, and products, networks for HES, and regulatory adjustment for working conditions, products and medical appliances. ELSA, including research ethics. EU COC is emphasized, but also stakeholder deliberation. Objectives are to build a solid knowledge

https://www.regjeringen.no/contentassets/5aa4911bcb474c0da4f21d1dcbc47ecb/63867_nanostrategi_web.pdf
platform, and suitable frameworks for responsible technology development. ELSA and HES research components in publicly funded research should be at a level among the leading countries internationally. This should be integrated in the technology development within academia, industry, health institutions etc., and as an integral component of technology projects.

Increased dialogue focus with society with Norwegian technology Board.

Code of Conduct is seen as providing guidance for R&D.

**Meso level: Trajectory of ELSA to RRI in FUGE/BIOTEK2021**

**Early influences innovation division**
For matters of brevity, the main focus related to influences and developments of RRI as a policy tool, we choose to focus on the sub-division currently named “Department for enabling technologies”, consisting of the strategic programmes IKT Pluss, BIOTEK2021 and NANO2021. The white paper “Blue Field” (2004-2005) established FUGE as the central policy tool for biotechnology research and innovation for a 10-year period (p. 69). Alongside other white papers, and particularly “Quality for Research” (2004) and “Climate for Research” (2008) establish the most distinct guideposts for strategy development in these technology areas.

**FUGE; background and evolution of strategy 2002-2010**

2001 FUGE – *Functional genomics in Norway - a national plan*

During the inception of the programme, there was an increased focus on functional genomics, in keeping with international developments. The programme was initiated with support from SAMGEN (cooperation between UiO, UMB, the Norwegian School of Veterinary Sciences). A meeting was hosted by RCN in December 2000, gathering researchers and institute directors, appointing a national committee. FUGE was broadly speaking a culmination of national committee work and received broad support from leading biotech research communities.

**Focus: Clear molecular genetic paradigm**

The primary focus was to recuperate Norwegian life-science-based industry disadvantage that was prevalent, and was initiated with broad institutional support.

**Objectives:**

Basic biological research (change research establishment/basic science), medical research and marine research.

**Means:**

- National distribution of responsibility
- Regional cooperation
- Industrial development
- Cooperation with top international researchers
• Address relevant research ethical issues

Organization:
FUGE distributed 300 mill NOK. This model was prior to the “strategic research programmes of RCN. There was an emphasis on building infrastructure, initiate researcher training and recruitment.

Role of ethics:
Ethical perspectives were marked by a focus on building bioethical expertise.

There was also a focus on ensuring research in conformity to principles underlying Norwegian culture, thus fostering ethical, legal, environmental and safety aspects of functional genomics.

• Awareness of negative impacts, risk and precaution
• “Considerable focus on ethical and legal aspects”
• Linear and ‘applied ethics’
• Facilitate development of national research expertise to ensure legitimacy and ethical acceptability

Conception of responsibility:
FUGE aimed at using functional genomics as a tool to facilitate responsible research not impacting the environment, on risk-mitigation, and avoiding negative impacts of biotechnology.

• Focus on environmental impacts
• Reduction of pollution
• Detect pollution
• Clean up pollution
• GMO conservative, safety focus

Action Plan 2007-2011
The Action Plan was based on the strategic plan (2001) where the main objectives were now reached, and the action plan now emphasized that the next phase called FUGE II focused on particular priority areas defined by the FUGE Board.

The action plan emphasized:

• Continuation (not preservation)
• High ambitions but limited budget
• Career building in functional genomics
• Research projects are to facilitate technology development
• Maintaining national perspective while gradually transferring platforms to host institutions
• The thematic priorities were still anchored in basic research

Ethics and societal perspectives

• 3-5% of the FUGE II budget would be earmarked to ELSA research
• Focus on strengthening societal dialogue
• Focus on “robust technological research and industry
• ERA-SAGE participation highlighted focusing on societal dialogue and ‘durable research strategies’.
Priorities for 2007 – 2011 emphasized that the 3-5% allocation to ethics/society be placed in separate calls

Funding platform concept in FUGE II:
More focus on technology platforms and move away from basic research and infrastructure. There was also a new focus in FUGE II on bioinformatics platform development.

Final report FUGE 2002-2011
In the Final Report, there was an introduction of the use of “societally robust technologies” (p. 10). FUGE’s strategy was summarized as developing strategic technology platforms to strengthen methodological competence and availability for the biotech-field, which gave the field a ‘lift’ in terms of increased competence, increased research activity and quality. It was seen that the strategic thematic areas (health, marine biotech and agri-biotech, with health as the largest funding allocation) proved a successful strategy. The ELSA-field had a significant emphasis, particularly in trans- and multidisciplinary research projects where complex issues related to technology and society-impacts were addressed. Societal communication was emphasized, including the public in general.

Collaboration with the ELSA programme:
The report confirmed that there had been a consistent 3% minimum allocation to ELSA projects in the portfolio, and FUGE was the first strategic programme to collaborate with the ELSA programme. The FUGE Board included members of the ELSA-research area, which has contributed to increased focus on the societal issues in FUGE projects. Research areas such as gene modification, synthetic biology, informed consent in biobanks, and ownership of natural resources were funded.

- Focus on fostering public debate
- 43 mill NOK in 15 ELSA-related projects funded
- The ELSA-area focused on multidisciplinary research on complex issues on the intersection of research, technology development and policy-institutions with the aim of developing “societally robust technology development”.
- Increased focus on deliberation and dissemination to authorities, society at-large and also RCN internally, alongside other policy institutions.

BIOTEK2021 work programme (2012-2021)
The BIOTEK2021 programme is a strategic, long-term initiative designed to further develop the Norwegian biotechnological research, representing a policy-shift from basic research to innovation-driven research, and conducive to the National Biotech Strategy (2011). There is a distinct ‘challenge’ –driven orientation which is markedly more oriented towards coordination of funding schemes in the RCN, and towards societal impacts, including societal responsibility, indicating a clearer self-understanding of RCN as a co-producer of research strategy implementation, including more focus on European collaboration. There is also a clear focus on societal challenges with emphasis on agricultural, marine, industrial and health sectors.

Four cross-cutting focus areas:
- Industrial development
- Biotech and society
- Industrial cooperation
Knowledge base and infrastructure

Emphasis on cooperation

“In-house” coordination and cooperation with other initiatives that encompass biotech such as:

- FRIPRO (independent research)
- National Financing initiative for Research Infrastructure (FORINFRA), User-driven research-based innovation (BIA) and the Eurostars programme, and other thematic programmes
- FUGE-initiated national cooperative and coordination-oriented initiatives continued and further elaborated
- Other funding and project-structures to be explored
- Cooperation with other strategic programmes
- Cooperation with ELSA/SAMANSVAR programme to create “coordinated, integrated initiative on ELSA-related issues

Primary objective:

“The BIOTEK2021 programme will generate biotechnology that contributes to value creation and innovation in order to solve societal challenges in a responsible manner.” (p.9)

Secondary objectives:

- Ensure responsible development of technology that addresses global societal challenges in the area of health and sustainable food and industrial application.
- Communication with specified target groups so to be in line with the needs of society.

Knowledge platform for future enterprises in Biotechnology (2010)

The Knowledge Platform-document represent a clear revision of priorities for the programme, and was produced prior to the establishment of the programme. It formed the RCN-anchored strategic platform that culminated in BIOTEK2021.

Deeply informed by “Climate for Research” (2008)

This white paper placed clear priorities that influenced priorities:

- Sustainable and economically viable solutions to address the grand global societal challenges.
- BIOTEK seen as a tool to meet the objective of sustainability, health and food.

The knowledge platform was also based on feedback in the closing of FUGE, labelled ‘BIOTEK2012’ in dialogue with research institutions, universities and industry and societal actors. It was produced in a time when Norway was still lagging behind the knowledge frontier. Here, ‘co-production’ is used as a term referring to potential of biotech, challenges and the needs of society. ELSA is explicitly described as committed to be integrated into research and innovation. Thus, a move away from traditional ELSA towards transdisciplinarity and integration. The focus of the document is marked by influences from the ELSA programme, the “Climate for research” white paper, and states that the knowledge platform is symptomatic with the ‘paradigm shift in research policy’ (p 11).

- Reference to the fall of the central dogma of molecular biology
- Enhanced understanding of complexity, and risks (p. 9)
• The revision of objectives referenced from the 2008 white paper also refers to the Lund commission
• The FUGE decade implied focus on national coordination and division of labor, while the next programme aims at a suspension of division of labor
• Societal challenges and solutions are deliberated in broad dialogue with society and cooperation between society and science

Societal challenges

The emphasis on societal challenges for the new programme was influenced by 60 opinions-papers that were received from research institutions, industry organizations, researchers and research-groups. The feedback had scope from health, food, climate and the environment, energy and sustainable industry.

• ‘Robust technology development’ is used as a concept, arguably lent from the National nanotechnology strategy.
• 30 interested parties from the above research areas met to discuss how biotech may be developed in a ‘robust’ fashion, balancing different societal needs. The meeting articulated a need for an adaptation of the paradigm shift in relationship between technology and society, new forms of science governance and challenges for Norwegian ELSA research.

The Road ahead:

Society is seen as a co-operator, including the necessity of dialogue and transparency. Competitiveness and innovation as marked by focus on ‘strong areas’, recruitment, national coordination, and infrastructure. The proclaimed ‘paradigm shift’ in research policy also affects ELSA research. The role of the RCN is understood as moving from administration to governance. Science and innovation are seen as a process instead of product.

The knowledge platform introduces a new conception of responsibility; co-production demands higher degree of responsibility of all parties, particularly the researchers, society, and policy-makers in particular.

ELSA still predominant; the co-production perspective is still labelled as relevant for ELSA-research. However, the new “ELSA2” perspective is informing a new emphasis on “integration” and presuppose that ELSA-perspectives must be integrated into the entire research-value chain. Further, and expanded ELSA perspective also includes policy perspectives and processes, including those of RCN and ministries, alongside strengthening conventional ELSA research.

A. Societally responsible innovation; An RRI-framework for BIOTEK2021, NANO2021, IKTPLUSS and SAMANVAR (v.1.0)

The framework document is dated December 2015.

The RRI-framework emphasizes more constructivist and social-science oriented approaches to research and innovation for RCN. Social responsibility and societal challenges are presented as deeply connected to RCN as a societal actor.

There is a direct link to RCN innovation strategy with emphasis on ‘challenges’: economical, environmental and societal, as well as co-production and governance challenges

Science in society – and society in science
Science and innovation are seen as not producing only ‘truth(s)’, but changes the ‘terrain’ in which science is conducted, including society. Research is seen as entangled with other societal and cultural factors.
Division of labor and distance to actors is ineffective
The complexity of such interwoven relationships argues for the relevance of RRI

Ambition

The framework articulates how RRI-informed research should be marked by:

- Experimentation, developmental work and learning
- Cross-sectoral and inter/transdisciplinary
- Inspired by EPSRC/ EU Rome declaration
- RRI-work in RCN

RRI’s role in the strategic programmes

IKTPLUSS, B IOTEK2021 & NANO2021, as strategic programmes should aim at being in line with the international RRI-policy frontier, and this view is inspired by paradigm shift in relationship between science and society

- From linear to co-production model
- Need for new forms of knowledge, competence and skills
- Inspired by CTA, EPSRC RRI-features and RTA

RRI-dimensions

The document elaborates how RRI dimensions should inform the research and innovation system:

By being anticipatory: Through diagnostic and prospective competence and capacity
By being reflexive: Through competence and capacity to deliberate on assumptions for research and innovation
By being inclusive: Through societal dialogue replacing monologue from research-side
By being dynamic and flexible (Responsive)

- The above dimensions should give continuous feedback and substance to an evolving governance of science and innovation
- Cooperation and involvement also from policy-actors (RCN, industry and NGOs and society)
- Development and monitoring of RCN RRI-work
- RRI seen as more a break than a continuation of current policy instruments and tools that have proven too limited, including ethics, risk assessment and regulatory mechanisms
- Focus on learning and cross-cutting cooperation
- The EC report Indicators for promoting and monitoring Responsible Research and Innovation as a ‘Norwegian’ contribution to RRI-informed policy work (Led by Roger Strand)
- The report illustrates many of the main indicators that RRI-work in the Division for Innovation will emphasize

The document seems to represent a move away from a focus on societal dialogue towards the cultivation of reflexivity and responsiveness in researchers and research institutions themselves, and
to foster new insights in the research and innovation processes. The framework emphasizes the cultivation of skills related to opening up R&D processes, acknowledge limits to knowledge and ignorance to the effects of innovation.