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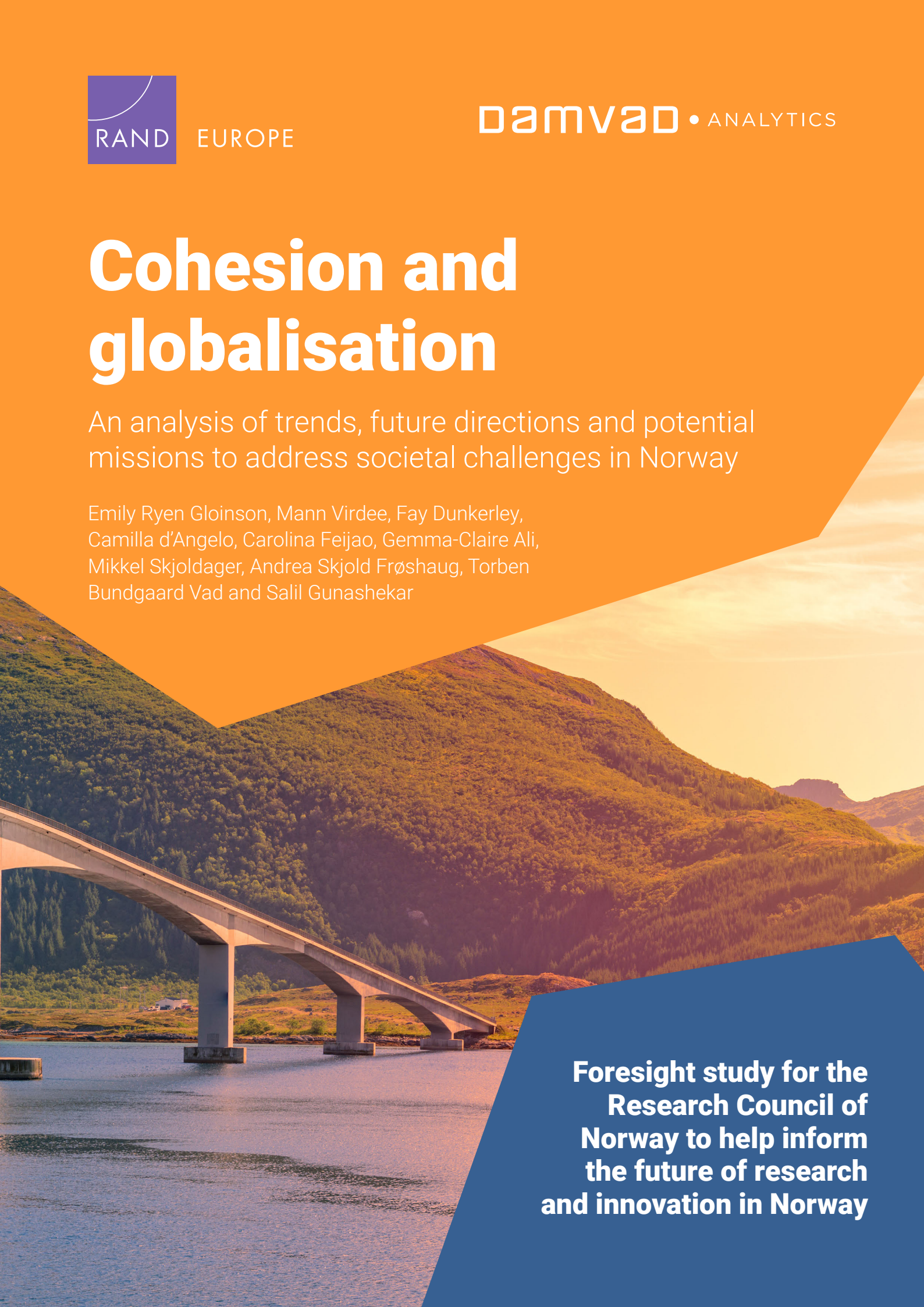
# Cohesion and globalisation

## An analysis of trends, future directions and potential missions to address societal challenges in Norway

Emily Ryen Gloinson, Mann Virdee, Fay Dunkerley, Camilla d'Angelo, Carolina Feijao, Gemma-Claire Ali, Mikkel Skjoldager, Andrea Skjold Frøshaug, Torben Bundgaard Vad and Salil Gunashekar



**Foresight study for the Research Council of Norway to help inform the future of research and innovation in Norway**

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# Preface

As part of its current strategy (2020–2024), the Research Council of Norway (RCN) has three primary objectives: ground-breaking research and radical innovation, sustainable development, and restructuring of the business and public sectors. Against this backdrop, the RCN commissioned RAND Europe and DAMVAD Analytics to carry out a foresight study to help inform the future of research and innovation (R&I) in Norway. The work will contribute to the development of a robust evidence base for the RCN's input to the revision of the Norwegian government's Long-Term Plan for Research and Higher Education 2019–2028 (hereafter, LTP). The study will also help inform the RCN's internal decision making, strategies and organisational activities.

The study focuses on the five strategic areas identified in the RCN's current strategy: (i) oceans; (ii) green transition; (iii) health and welfare; (iv) cohesion and globalisation; and (v) technology and digitalisation. The specific aims of the study were to:

- Identify a set of potential priority missions or targeted, challenge-based policy actions within and across (or outside) the five strategic areas that the RCN, together with other stakeholders, could consider implementing in the future to help address societal challenges; and
- Identify system-level structural measures to potentially facilitate the development of a resilient R&I environment in Norway.

We adopted a mixed-methods, participatory approach to the research, involving a variety of methodologies, such as trend analyses, literature reviews, stakeholder interviews, focus groups, an online survey of the public, crowdsourcing ideas and information from experts, future scenario analyses and workshops. All of these methods are covered in this report.

We envisage that the research will be of interest to funders and academia, national and local government policymakers, innovators and practitioners, and industry, and, more broadly, to anyone – including the public – interested in R&I and wider societal challenges.

This report on cohesion and globalisation is one in a series of nine reports presenting the findings of the study. The other reports are as follows:

- Health and welfare: An analysis of trends, future directions and potential missions to address societal challenges in Norway
- Technology and digitalisation: An analysis of trends, future directions and potential missions to address societal challenges in Norway
- Oceans: An analysis of trends, future directions and potential missions to address societal challenges in Norway
- Green transition: An analysis of trends, future directions and potential missions to address societal challenges in Norway
- Structural measures to develop a resilient research and innovation environment in Norway
- A summary of potential cross-cutting missions to address future societal challenges in Norway

- Addressing future societal challenges in Norway: Detailed methodology report
- Addressing future societal challenges in Norway: Key trends, future scenarios, missions and structural measures

We have been able to conduct this study because of the contributions of many individuals. We would like to thank the project team at the Research Council of Norway for their excellent guidance, support and advice over the course of the study. In particular, we would like to thank Stig Slipersæter and Philip Lorentzen. We are also grateful to the executive board of the RCN for constructively engaging with us at various points in the study. We would like to thank Andrew Curry (School of International Futures) for helping organise and run the stakeholder foresight workshops. We are grateful for the valuable inputs from the members of our advisory panel of experts, namely, Dr Sonja Marjanovic (RAND Europe, health and welfare expert), Stijn Hoorens (RAND Europe, cohesion and globalisation expert), Prof. Paula Kankaanpää (Marine Research Centre, the Finnish Environment Institute (Suomen ympäristökeskus, SYKE), oceans expert), Prof. Eeva Primmer (SYKE, green transition expert), Dr Jonathan Cave (University of Warwick, technology and digitalisation expert), Prof. Hakan Sicakkan (University of Bergen, cohesion and globalisation expert), and Mona Skaret (Bouvet ASA, research and innovation expert). We are also very grateful to the many stakeholders – across academia, industry, government, the third sector and the public – who kindly agreed to engage with the study at various stages. Finally, we would like to thank our quality assurance reviewers, Dr Susan Guthrie (RAND Europe) and Asbjørn Boye Knudsen (DAMVAD Analytics), for their valuable advice and critical review of the research.

RAND Europe is a not-for-profit research organisation that aims to improve policy and decision making in the public interest, through research and analysis. RAND Europe's clients include European governments, institutions, non-governmental organisations and firms with a need for rigorous, independent, multidisciplinary analysis. DAMVAD Analytics is a Nordic, research-based consultancy with offices in Copenhagen and Stockholm. DAMVAD's consultants have strong analytical and evaluation skills and specialised knowledge regarding research and innovation policy throughout the Nordic region, including Norway.

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# Abbreviations

| | |
|---|---|
| ASEAN | Association of Southeast Asian Nations |
| EEA | European Economic Area |
| EFTA | European Free Trade Area |
| EU | European Union |
| GDP | Gross domestic product |
| GHG | Greenhouse gas |
| GNP | Gross national product |
| IMF | International Monetary Fund |
| LTP | The Long-Term Plan for Research and Higher Education 2019–2028 – Meld. St. 4 (2018–2019) Report to the Storting (white paper) |
| NATO | North Atlantic Treaty Organization |
| NEETs | Not in education, employment, or training |
| NIM | Norges Institusjon for Menneskerettigheter [Norwegian National Human Rights Institution] |
| NRM | Nordic Resistance Movement |
| OECD | Organisation for Economic Co-operation and Development |
| PESTLE | Political, economic, societal, technological, legal and environmental |
| R&I | Research and innovation |
| RCN | Research Council of Norway |
| SDGs | [United Nations] Sustainable development goals |
| SIAN | Stop the Islamisation of Norway |
| UK | United Kingdom |
| UN | United Nations |
| UNDP | United Nations Development Programme |
| USA | United States of America |
| WHO | World Health Organization |
| WTO | World Trade Organization |

# 1. Introduction

The research and innovation (R&I) landscape in Norway is underpinned by Norway's overarching ambition for research and higher education, namely to help facilitate growth in overall value creation, to create new and profitable jobs, to restructure the Norwegian economy and to help implement a transition towards a greener society (Ministry of Education and Research 2019). The development of a strong knowledge base through research is necessary to fulfil these ambitions but also to train the Norwegian workforce (Ministry of Education and Research 2019). The Long-Term Plan for Research and Higher Education[1] (hereafter LTP) details the Norwegian government's ambitions and policy for research and higher education in Norway. The LTP establishes ten-year objectives and priorities and concrete goals for efforts in the upcoming four-year period. It sets the course for policy development and investments in research and higher education in Norway.

The Research Council of Norway (RCN) plays a critical role in the Norwegian and international research and innovation landscape, as the national funding agency for R&I. In its current strategy (2020–2024), the RCN details priorities and goals to help realise the objectives of the LTP (Research Council of Norway 2020a). As part of its current strategy, the RCN has articulated the following three primary objectives, with the overarching view of achieving a 'well-functioning research and innovation system' (Research Council of Norway 2020a):

- Sustainable development;
- Ground-breaking research and radical innovation; and
- Restructuring of the business and public sectors.

Within this framework, the RCN has also identified five core 'strategic areas' (as shown in Figure 1) within which to focus its priorities and portfolio plans and within which deliver high-impact research and innovation (Research Council of Norway 2020a).

**Figure 1. The five strategic areas identified by the RCN in its current strategy (2020–2024)**


[1] The Long-Term Plan for Research and Higher education 2019-2028 – Meld. St. 4 (2018-2019) Report to the Storting (white paper).

## 1.1. Objectives of the study

Against this backdrop, the RCN commissioned RAND Europe and DAMVAD Analytics to carry out a foresight study to contribute to the development of a robust evidence base for the RCN's input to the 2022 revision of the Long-Term Plan for Research and Higher Education 2019–2028 (Ministry of Education and Research 2019). The study will also help inform the RCN's internal decision making, strategies and organisational activities. The study focuses on the five main strategic areas identified in the RCN's current strategy for the next ten years (Research Council of Norway 2020a) and is intended to help frame thinking about the future of R&I in relation to these strategic areas in Norway. As noted above, the five strategic areas covered by this study are: (i) oceans; (ii) green transition; (iii) health and welfare; (iv) technology and digitalisation; and (v) globalisation and cohesion. In particular, the study aims to:

- Identify a set of potential priority missions or targeted, challenge-based policy actions within, across or outside the five strategic areas for the next ten years that the RCN, together with other stakeholders, could consider implementing in the future to help address societal challenges; and
- Identify a series of system-level structural measures to facilitate the development of a resilient R&I environment in Norway.

For this study, we regard missions as targeted, timebound, concrete priority actions to help solve one or more societal challenges that the RCN and other stakeholders could consider developing and implementing in the future. In the long term, the missions will help the RCN achieve its overarching objectives (over a roughly ten-year time frame) and eventually contribute to enriching lives locally, nationally and internationally.[2] Structural measures can be considered to be foundational, system-level instruments, policies, or tools in the R&I landscape that contribute to the translation of R&I into wider societal benefits. In the context of this study, they are intended to be a range of measures (with varying levels of specificity and generally cutting across multiple strategic areas) that help develop a resilient R&I environment in Norway and also address the wider performance of the R&I system in terms of the RCN's three overarching objectives.

This report, one in a series of nine reports, presents an analysis of trends, future directions and potential missions for the cohesion and globalisation strategic area.[3]

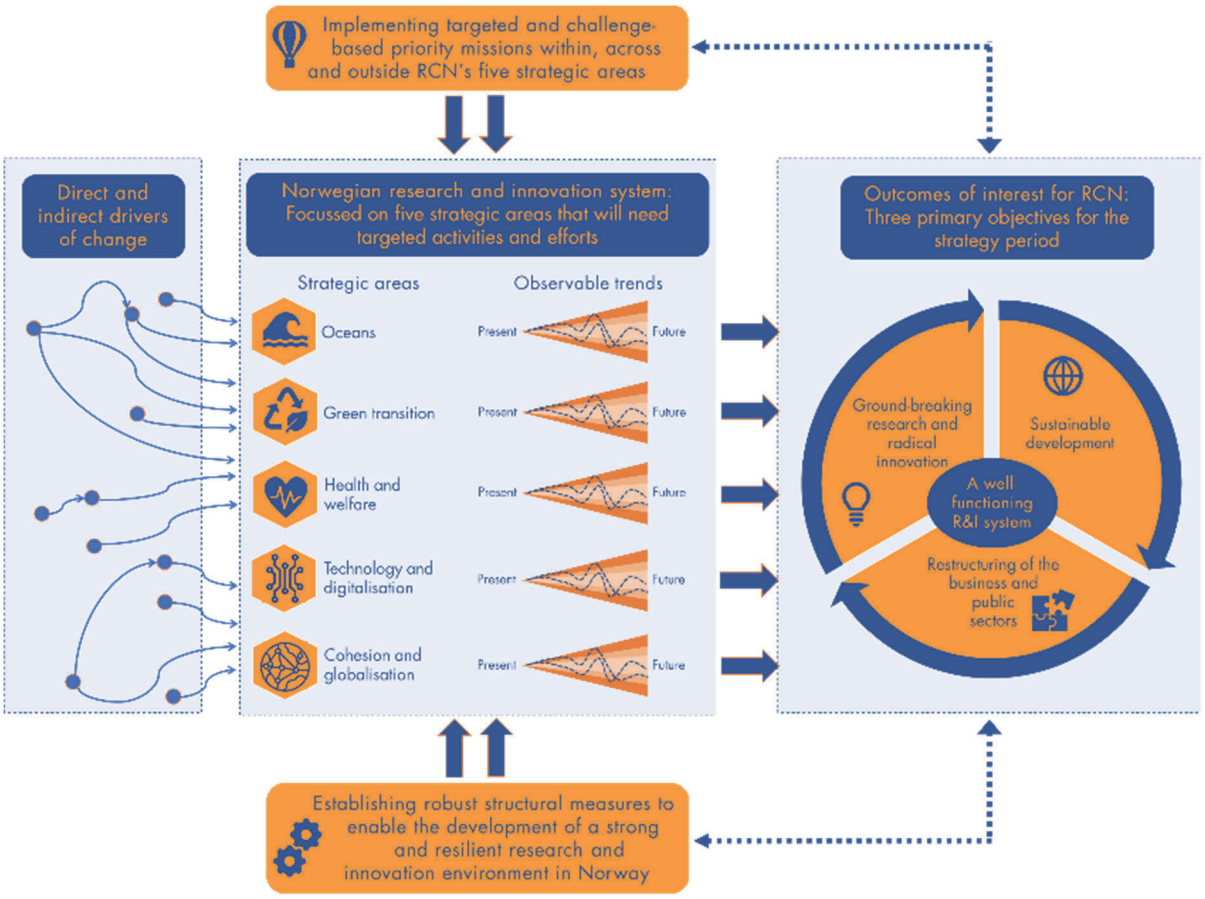
[2] More broadly, missions are systemic policies that operate both as a means of steering economic growth in a particular direction (by, for example, steering investments towards particular societal challenges) and as a tool that can be used to get there (by, for example, setting clear, problem-focused objectives) (Mazzucato 2018). Further details are provided in Chapter 6 of this report.

[3] This report on cohesion and globalisation is one in a series of nine reports presenting the findings of the study. The other reports are as follows: Health and welfare: An analysis of trends, future directions and potential missions to address societal challenges in Norway (Gloinson et al. 2021); Oceans: An analysis of trends, future directions and potential missions to address societal challenges in Norway (Skjoldager et al. 2021b); Green transition: An analysis of trends, future directions and potential missions to address societal challenges in Norway (Skjoldager et al. 2021a); Technology and digitalisation: An analysis of trends, future directions and potential missions to address societal challenges in Norway (d'Angelo et al. 2021); A summary of potential cross-cutting missions to address future societal challenges in Norway (Gunashekar et al. 2021a); Structural measures to develop a resilient research and innovation environment in Norway (Skjoldager et al. 2021c); Addressing societal challenges in Norway: Key trends, future scenarios, missions and structural measures (Gunashekar et al. 2021b); and Addressing future societal challenges in Norway: Detailed methodology report (Gunashekar et al. 2021c).

## 1.2. Conceptual framework for the study

Our overall conceptual framework (Figure 2) was targeted at providing a key analytical tool to enable us to carry out a rigorous, detailed and comprehensive futures analysis for the RCN. It is based on a participatory approach involving a range of diverse stakeholders, detailed trend analyses and rigorous scenario planning that contributed to the conceptualisation and achievement of the overarching aims of the study, i.e. to identify a set of potential priority missions related to the RCN's five strategic areas and underlying structural measures to enable the development of a robust, resilient and socially responsible research and innovation environment in Norway.

**Figure 2. Conceptual framework for the study**




Source: Study team analysis

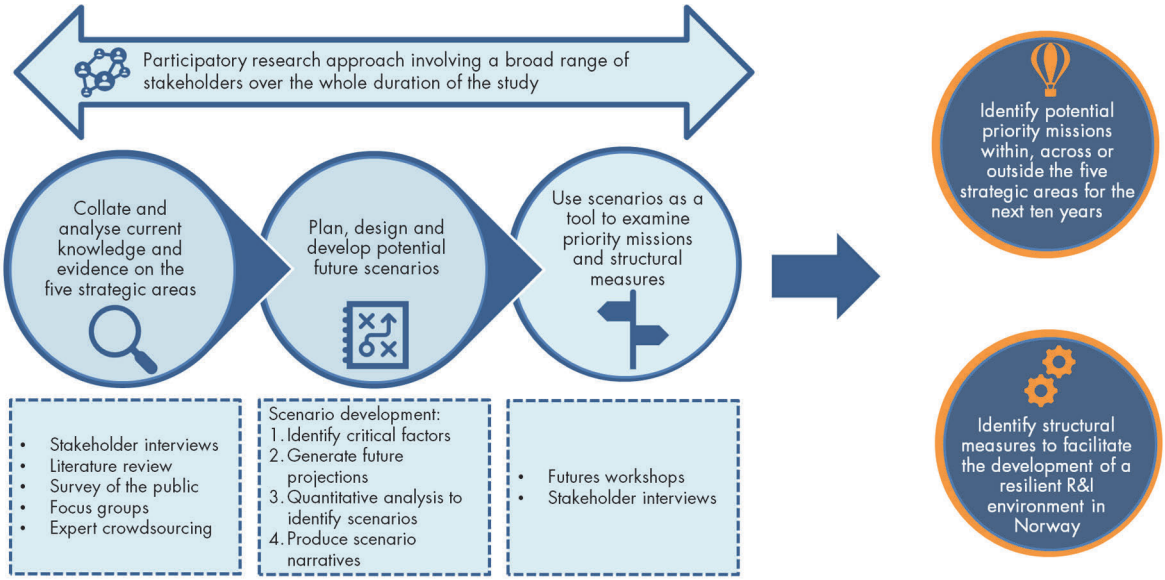
The conceptual framework for the study shown in Figure 2 provides a systems-level view of the various high-level interconnected components of the R&I ecosystem. A series of potentially interconnected drivers (as shown on the left of the figure) can either directly or indirectly influence or cause change in the wider Norwegian R&I system. The system itself is characterised by a series of observable trends or discernible patterns of change relating to the five strategic areas, as illustrated in the middle of the figure. An evidence-based foresight approach to explore a range of plausible futures can help the RCN arrive at decisions 'today' that will potentially mitigate future risks and enable future opportunities to be better anticipated. The conceptual framework therefore illustrates the importance not only of realising benefits for the Norwegian R&I system, but also of managing and mitigating against risks. As shown on the right of the figure, the

system is also composed of the main outcomes of interest to the RCN, which are their primary objectives over the current strategy period (2020–2024) (i.e. sustainable development, ground-breaking research and radical innovation, and restructuring of the business and public sectors). If these outcomes are achieved, this could help realise the RCN's overarching desired outcome of a 'well-functioning research and innovation system'. To accomplish these high-level goals, it is necessary to have a set of policy levers or actions that can help steer the system towards the outcomes of interest. Therefore, identifying and implementing a set of targeted, timebound and challenge-based actions – or priority missions – within and across (or even outside) the RCN's strategic areas could form the basis for recognising concrete focus areas for the future. Furthermore, implementing the missions successfully will require the establishment or improvement – in parallel – of key underpinning structural measures at a systemic level. Thus, a mix of appropriate structural measures, together with a set of carefully developed priority missions – and both involving diverse stakeholders – could help the RCN meet its current objectives and ultimately contribute to enriching lives locally, nationally and internationally.

## 1.3. Summary of the methodology

This section provides a summary of the research approach and methodology. A detailed description of the methodology is provided in the accompanying methodology report (Gunashekar et al. 2021c). We adopted a mixed-methods, participatory approach to the research to achieve the study objectives, as illustrated in Figure 3. The methods included literature reviews, stakeholder interviews, focus groups, a survey of the public, crowdsourcing ideas and information from experts, future scenario analyses and workshops. Over the course of the study, we engaged with a broad range of stakeholders across academia, government, industry, the not-for-profit sector, the RCN and the public.

**Figure 3. High-level overview of our approach to implementing the research**

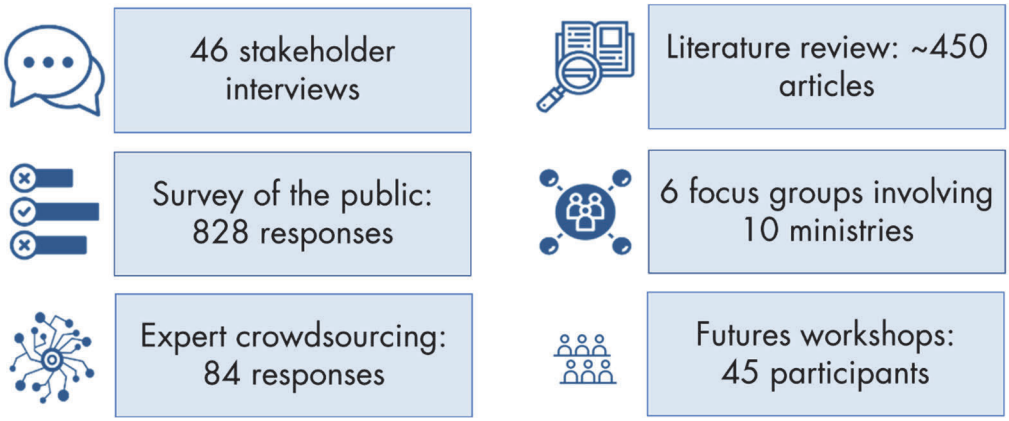



Source: Study team analysis

## Trend analyses

As noted in the previous section, each strategic area is characterised by several trends that are shaping developments and driving change within those areas. In the first phase of the study, we carried out a detailed trend analysis for each strategic area, by collecting and analysing wide-ranging evidence to help develop a robust knowledge and information base. The information collected in the trend analysis enabled us to develop a deep and rounded understanding of the status quo and direction of travel within (and outside) the R&I landscape for each strategic area (oceans, green transition, health and welfare, technology and digitalisation, and globalisation and cohesion). Specifically, we identified the main trends, enablers, barriers and uncertainties that will potentially shape the strategic area over the next ten years or so. The trend analyses also directly informed the indicative priority missions[4] and structural measures. The trend analysis synthesised evidence from the main data collection activities, as outlined in Figure 4.

**Figure 4. Main data collection activities undertaken in the research**




Source: Study team analysis

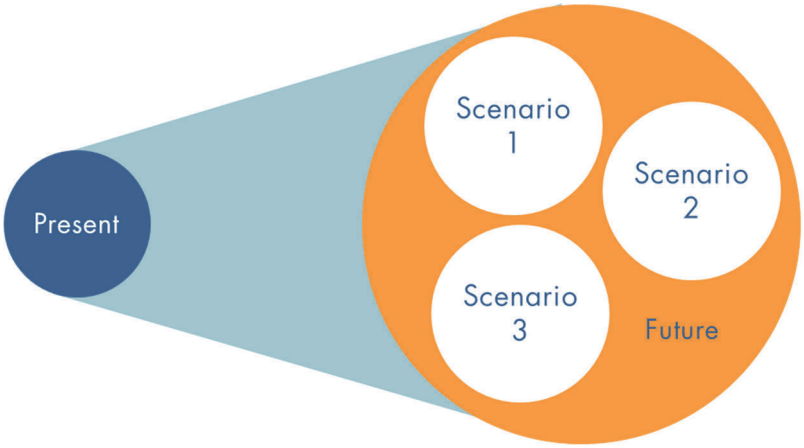
## Scenario methodology

In the second phase of the study, we designed and developed plausible future scenarios using the information collected in the trend analyses (Figure 5). Scenarios are stories or narratives that are used to describe the alternative and possible ways in which a situation or environment might develop in the future (Government Office for Science 2017). Within each scenario, there is a complex network of influence factors[5] that shape that future (Gausemeier et al. 1998).

[4] For clarity and ease of reference, we reiterate what we mean by missions in the context of this study. We regard missions as targeted, timebound, concrete priority actions to help solve one or more societal challenges that RCN, together with other stakeholders, could consider implementing in the future. The missions will help RCN achieve its overarching objectives (over a roughly ten-year time frame) and eventually contribute to enriching lives locally, nationally and internationally. Further information is provided in Chapter 6 of this report.

[5] In this study, the influence factors have been found based on the trends, barriers, enablers and uncertainties we identified in the trend analyses.

Figure 5. Plausible future scenarios, presenting a wide range of potential future states




To build scenarios of sufficient depth and distinctiveness, we used a rigorous and iterative process that involved the examination of the different factors, enablers, barriers and drivers of change that are shaping developments within, across and outside the five strategic areas. We generated two sets of scenarios by combining different aspects of the five strategic areas (in Figure 5, the orange area represents an exemplar set of three distinct future scenarios). Each scenario set comprised four distinct scenarios based on 15–20 prioritised political, economic, social, technological, legal and environmental (PESTLE) factors from the trend analyses that could influence the strategic areas (specifically, these factors were derived from the trends, enablers, barriers and uncertainties that were identified in the trend analyses). The two scenario sets were as follows:

- **Scenario set 1 (*Norway in a national context*):** The first scenario set broadly focuses on Norway in a national context, largely relating to the Norwegian domestic agenda. This scenario set encompasses health, welfare, education, work and skills, cohesion, and relevant aspects of technology and digitalisation, and it also covers some aspects related to green transition (for example, in relation to the circular economy).
- **Scenario set 2 (*Norway in a global context*):** The second scenario set focuses on Norway in an international or global context, primarily relating to Norway's outward-facing role. It broadly covers themes related to climate, oceans, energy, transport, food, biodiversity, globalisation and relevant aspects of technology and digitalisation.

## Examining potential missions and structural measures

The different scenarios facilitate the anticipation of what might happen in the next 20 years and help reflect changes in the R&I system as well as the wider, 'macro' environment. We used the scenario sets as the basis for discussions at two virtual foresight workshops, attended by a total of 45 stakeholders (across academia, industry, the third sector and the RCN). Using the scenarios to represent a range of distinct and plausible future states, workshop participants examined and validated a series of indicative priority missions and discussed potential structural measures. Following the workshops, a set of interviews were conducted with additional stakeholders and further desk research was carried out. The indicative missions and structural measures were further refined and updated based on feedback received at the workshops and on the additional desk research and interviews.

### 1.3.1. Caveats of the analysis

When reading and interpreting the analyses presented in this report, the reader needs to consider some caveats. This report analyses the trends, future directions and potential missions in the cohesion and globalisation strategic area of the RCN's current strategy. Cohesion and globalisation are wide-ranging, complex and rapidly evolving areas, not just in Norway, but also more broadly, in a global context. To accomplish the key objectives of the study while implementing the research within the timelines, we have had to keep the research focused on key topics of importance, not aiming for a systematic coverage of all topics. While the areas of focus might not be exhaustive, as outlined in the previous section, we adopted a participatory approach to the study – involving a diverse range of stakeholders – and incorporated a variety of different methods to triangulate the evidence. This has enabled us to cover a wide spectrum of important issues related to cohesion and globalisation in Norway.

Furthermore, the research presented in this report is part of a larger study that also includes four other broad strategic areas (oceans, green transition, technology and digitalisation, and health and welfare). Depending on the discussion in the literature and supported by interviewee inputs, where relevant in the analysis presented in this report, we have also considered cross-cutting implications of the strategic areas on each other. Notably, the technology and digitalisation and cohesion and globalisation strategic areas are predominantly cross-cutting in terms of their breadth of influence on the other strategic areas. Nevertheless, this report is intended to be stand-alone, and therefore the emphasis is on the trends and future socio-economic directions observed in relation to cohesion and globalisation.

Finally, the ideas for the priority missions that we have articulated are not intended to be definitive or exhaustive. Each mission is proposed as an indicative idea at this stage, based on the evidence collected during the research. The missions were examined and validated at stakeholder workshops and then further updated based on feedback received at the workshops and from the RCN. The collection of missions that we have presented for the cohesion and globalisation strategic area represent a broad spectrum of ideas for further consideration and exploration by the RCN – and other stakeholders that might be involved in the process to implement any potential missions in the future.

## 1.4. Outline of the report

The remainder of the report is structured as follows:

- In Chapter 2, we describe the trends shaping the cohesion and globalisation landscape in Norway.
- In Chapter 3, we provide an overview of the barriers and enablers to cohesion and globalisation research and innovation in Norway.
- In Chapter 4, we describe the key uncertainties and policy challenges that influence developments regarding cohesion and globalisation in Norway.
- In Chapter 5, we summarise the future scenarios we employed at the foresight workshops to examine the indicative missions and structural measures related to the cohesion and globalisation strategic area (as well as the other strategic areas).

- Finally, in Chapter 6, we provide a list of indicative priority missions for the cohesion and globalisation strategic area in Norway.
- In the Annexes, we present the comprehensive versions of the scenario narratives for both scenario sets and a high-level overview of all the indicative mission ideas that have been articulated within and across the RCN's five strategic areas.

# 2. Trends shaping developments related to the cohesion and globalisation strategic area

This chapter presents the key trends influencing the development of the cohesion and globalisation landscape in Norway. In the following discussion, we have drawn on the published literature (both peer-reviewed and grey literature) and additional information and insights provided by a range of stakeholders across academia, industry, government, the third sector and the RCN.[6]

**Box 1. Summary of key trends related to the cohesion and globalisation strategic area**

- **Trend 1:** An increased global awareness of climate change may lead to a reduction in fossil fuel demand and consumption.
- **Trend 2:** The nature of work is changing.
- **Trend 3:** Demographic changes present challenges for cohesion in Norwegian society.
- **Trend 4:** The multilateral system and international cooperation, which Norway benefits from, is facing increasing pressure from new and emerging powers.
- **Trend 5:** Social inequalities in Norway are increasing.
- **Trend 6:** Global interconnectedness and interdependence are increasing, with shifts in the prominence of actors in international politics.
- **Trend 7:** The challenges towards democracy and trust are increasing globally.

## 2.1. Context

In 2019, the government of Norway introduced a new priority area for its 'Long-term Plan for Research and Higher Education 2019–2028': societal security and social cohesion in a globalised world (Ministry of Education and Research 2019). Globalisation refers to the increasing interdependence and connectedness of the world's economies, cultures and populations, driven by cross-border trade in goods and services, technology, and flows of investment, people and information (Peterson Institute for International Economics (PIIE) 2018). At the same time, this interconnectedness has also brought with it a sense of anxiety regarding social cohesion, reflecting the uncertainties and perceived ill effects of globalisation. Jo Ritzen, former vice president of the World Bank, summarised it thus: 'one of the paradoxes of our age is that the more things come together, the more they fall apart' (Ritzen 2000). The Research Council of Norway's strategy from 2020–2024 states that while the forces of globalisation, internationalisation and digitalisation have opened up economies, enhanced trade and increased the exchange of culture, they have also given rise to new types of criminal activity, methods of espionage and efforts to interfere in democratic processes (Research Council of Norway 2020).

[6] Interviewee inputs are cited in the discussion throughout this report using anonymised, unique identifiers 'INT-CG-XX' where XX is a number between 01 and 12. We also conducted a small number of cross-cutting interviews that covered multiple strategic areas – these have been cited throughout the report using the anonymised, unique identifiers 'INT-CC-XX'.

Norway is a welfare state that has been characterised by relatively small social differences, a high level of trust in public administration and a strong civil society. However, the RCN notes that an ageing and more socially and culturally heterogeneous population, together with increased economic inequality, may weaken support for and funding of the welfare society, and challenge the legitimacy of democratic institutions (Research Council of Norway 2020). To this end, the RCN intends to invest in research and innovation in order to: promote insight into global change processes and Norway's influence on these, as well as to understand how Norway is impacted by these in order to mitigate potential adverse effects; promote a robust democracy that enjoys a high level of trust and legitimacy; promote an inclusive, diverse and equal society; and promote societal security based on effective preparedness and risk prevention (Research Council of Norway 2020).

This analysis focuses on trends in Norway around globalisation and social cohesion, as well as barriers, enablers, uncertainties and policy challenges.

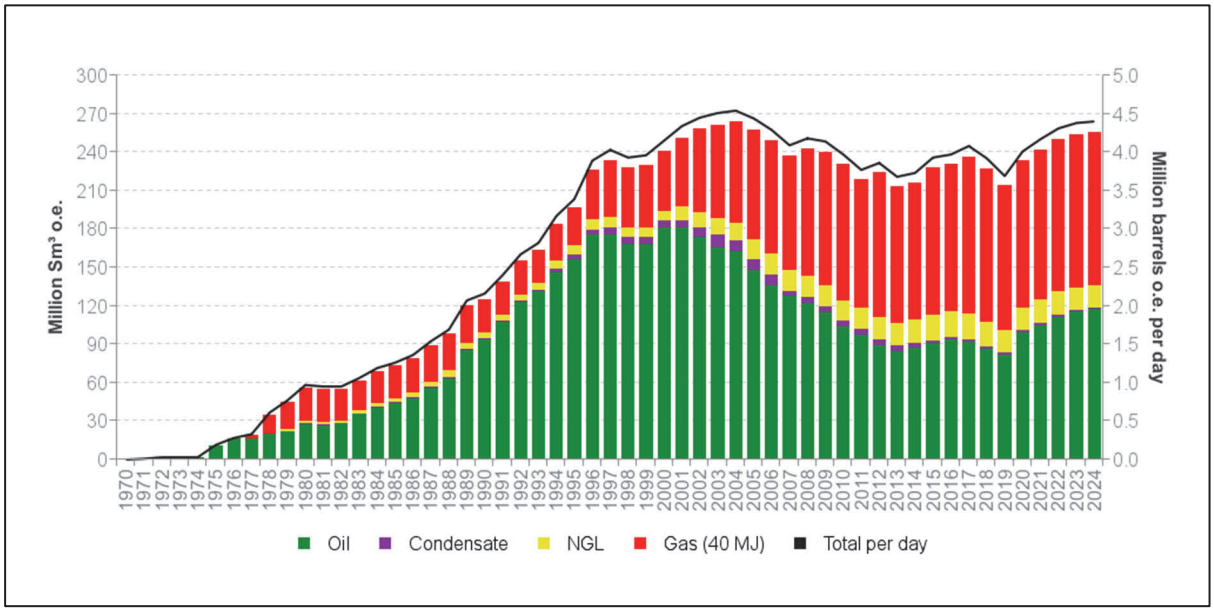
## 2.2. Key trends shaping the cohesion and globalisation strategic area

### Trend 1: An increased global awareness of climate change may lead to a reduction in fossil fuel demand and consumption

Climate change is often cited as the most important challenge facing the world. Despite efforts by many countries to reduce fossil fuel consumption, fossil fuel production is expected to increase (International Energy Agency 2016). Over the last decade, Norway's crude oil production has remained around 1500–1600 MBPD[7] but is projected to increase in the years ahead (Figure 6). The tension between concerns about climate change and economic considerations can also be seen through Norway's climate targets on one hand, and on the other the fact that the oil and gas industry accounts for around a fifth of Norway's gross domestic product (GDP) and two-thirds of its exports (European Commission 2020). Norway's oil fund ensures 'responsible and long-term management of revenue from Norway's oil and gas resources in the North Sea so that this wealth benefits both current and future generations' (Norges Bank Investment Management 2021). Indeed, Norway used a record $37bn from its oil fund to support itself during the COVID-19 pandemic (Holter 2020).

[7] MBPD refers to a thousand barrels of oil per day.

Figure 6. Historical and expected crude oil production in Norway, 1970–2024




Source: (Norwegian Petroleum 2020)

Interviewees noted that rise in global concern about climate change and commitments to tackling it through a 'Green Transition' will change global markets (INT-CG-10; INT-CG-6). Nearly all oil and gas produced on the Norwegian shelf is exported, and accounts for about half of the total value of Norwegian exports, making oil and gas the most important export commodities in the Norwegian economy (Norwegian Petroleum 2020). In addition, climate change may have an impact on other issues related to globalisation and cohesion. One interviewee said that with increasing global differences between the global north and south and with climate issues, migration will increase globally (INT-CG-3). At the same time, this wealth means that Norway is well placed to demonstrate global leadership in reducing dependence on fossil fuel. The significant savings built up through the oil fund puts Norway in a better position than many other countries to offer leadership on a Green Transition (Stockholm Environment Institute 2017). However, this would also depend in part on a more qualified and foreign labour force. One interviewee also noted that it would be necessary to move beyond a sectoral approach to have a coordinated response to the green transition (INT-CG-5).

## Trend 2: The nature of work is changing

In some parts of the economy, manufacturing jobs may be lost to automation (World Bank Group 2019). However, while the rising forces of automation, digitalisation and robotisation may render many jobs obsolete, they may simultaneously create new jobs, occupations and opportunities (Fölster n.d.; INT-CG-11). For instance, over the period 2009–2014, the Reform Institute estimated that around 7–9 per cent of jobs in Norway were lost to automation, representing somewhere between 166,000–200,000 jobs (Fölster 2020). If this trend continues, the share of jobs automated is expected to be about one-third over a twenty-year period (Fölster 2020). In contrast to the inevitability of job losses, the number of jobs created by these forces can be improved through policy response and preparedness. Cross-country comparison indicates that Norway could capitalise on the opportunity offered by digitalisation; many more jobs could have been created in this area but were instead crowded out by job growth in the natural resources sector – namely oil

and gas (Fölster 2020). Research by McKinsey suggests that by 2030, the job substitution effect will be 18 per cent, and the job creation from direct and spill over effects will be 17 per cent. The range for net employment effect by 2030 in Norway is -0.5 per cent to 0.5 per cent (McKinsey & Company 2017), suggesting that whether this is a threat or opportunity is dependent on Norway's response.

While e-retail trade may give rise to more delivery jobs in the short-medium term, for example, we can expect these jobs to be automated in the long term. In the future, Norway will likely need a more high-skilled labour force. This depends on ensuring strong foundation skills for all, reducing drop-outs in the secondary education system in Norway, helping to inform educational choices through better public data and professional career guidance services for young people and adults (OECD 2014; 2020a; INT-CG-5). Other priorities relevant to the Norwegian context include enhancing labour market participation for those who receive disability benefits; encouraging labour market attachment among low-skilled youth; ensuring that Norwegians remain active in working life for longer; engaging employers in ensuring a highly skilled workforce; promoting innovation and entrepreneurship; and enhancing the use of migrants' skills – which should be reflected in universities and the higher education sector (OECD 2014; 2020c).

The labour market in Norway is also changing following the COVID-19 pandemic, with higher unemployment numbers in Norway, increased labour market competition, and reduced demand for employment in the tertiary sector (Ministry of Labour and Social Affairs 2021). COVID-19 has also created new ways of working across many sectors in Norway. Digital competencies in the employment sector and the number of employees who work from home have increased (Ministry of Labour and Social Affairs 2021). It is also noted that the automation of work is happening quicker than before the pandemic (Ministry of Labour and Social Affairs 2021).

By 2040, there may be around 450,000 low-skilled and 150,000 high-skilled immigrants in the Norwegian labour force (Economics Norway 2019). The projection of an increased and surplus supply of low-skilled labour does not mean that there will not be demand for low-skilled labour, but instead that the competition for low-skilled jobs will increase. For workers whose highest educational attainment level is primary or lower secondary, the unemployment rate in 2040 may be around 25 per cent (Economics Norway 2019). This surplus of low-skilled labour may threaten the sustainability of Norway's model for wage formulation; low-wage competition may reduce unemployment whilst reducing the real wages among those already employed (Economics Norway 2019).

One way of closing the employability skills gap is to focus on 'soft' skills such as creativity, leadership and critical thinking as these capabilities are central to delivering business value and adapting hard skills as workforce needs change (Radin et al. 2020). One interviewee also felt that as the nature of work is changing, it will also be necessary to change education and to recognise that we will learn in different ways than we have previously (INT-CG-7). Another interviewee argued that it will be important to conduct research in political science and sociology to understand how to influence a Norwegian society and employment market that is increasingly influenced by digitalisations (INT-CG-10). The Organisation for Economic Co-operation and Development (OECD) recommends that Norway firstly, contributes to making informed choices for the individual and for society through creation and the provision of information on aspects such as skills forecasting and career guidance (OECD 2020c). Secondly, Norway should promote learning in the workplace and the effective use of skills, including through dual vocational and educational training,

increased co-ordination between the labour market and higher education institutions, reskilling with a focus on digital skills, and improved certification of skills that are required in the workplace (OECD 2020c). Finally, the OECD recommends to enhance skills among adults who have weak labour market attachment (OECD 2020c).

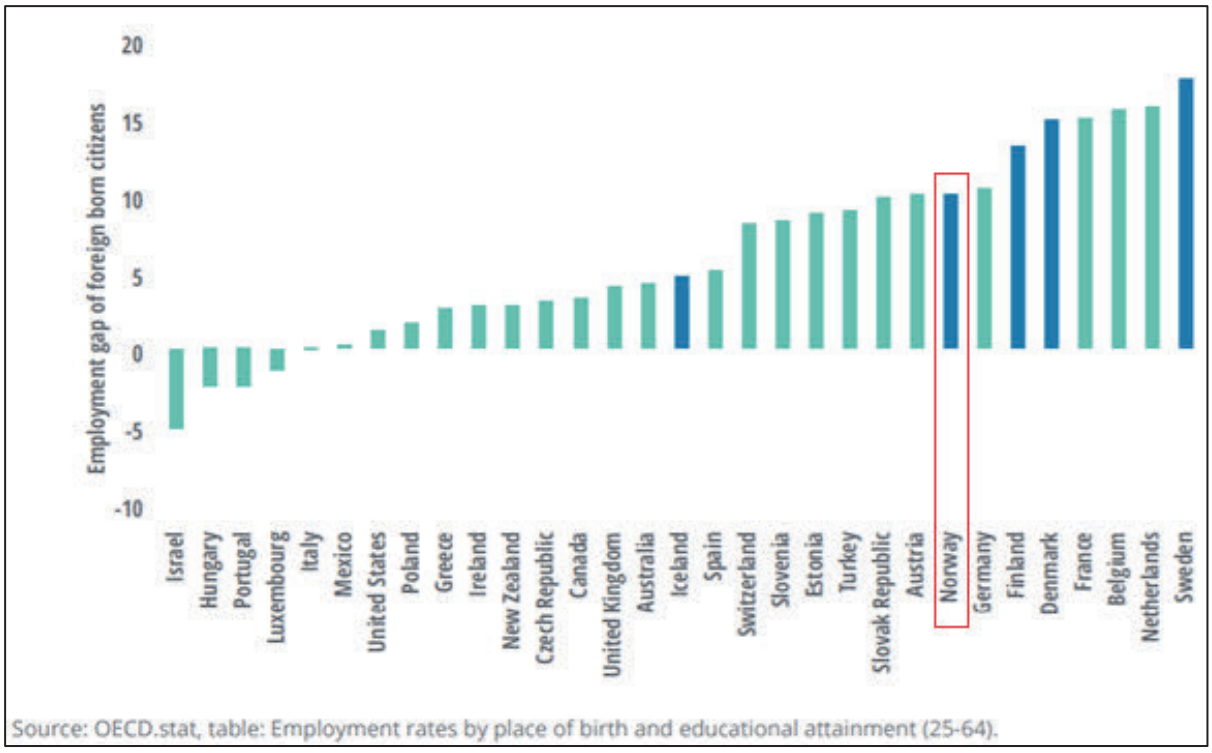
## Trend 3: Demographic changes present challenges for cohesion in Norwegian society

Norway faces several challenges from demographic changes such as an ageing population and an increase in migration. Such challenges could pose a threat to cohesion of Norwegian society.

Ageing population is a global phenomenon, and Norway will also be impacted by this – albeit to a lesser degree than some other European countries. By 2030, there will be more elderly people (aged 65+) than young people (aged 0–19) in Norway (Statistics Norway 2020). Other trends that will characterise Norwegian population development in decades to come include lower population growth and more elderly immigrants. The number of people who are very old (aged 90+) is expected to increase from 45,000 to 210,000 by 2060 (Statistics Norway 2020). This demographic shift presents several challenges. As a greater proportion of the population live into their old age and require retirement income, there will be a smaller proportion working and paying tax. Additionally, the ageing population will likely increase healthcare costs. Potential solutions to this problem – reducing pension pay-outs, increasing tax and increasing the retirement age – are likely to be unpopular, although the nature of the problem means that all three of these may be required simultaneously (Nikel 2020). One interviewee also noted that demographic changes in Africa will be important as there will be a shift with an increasingly young and dynamic population that will impact on Norway's work internationally (INT-CG-11).

Although migration is not a new phenomenon in Norway, it was relatively homogeneous in 2000 – with an immigrant population of 5 per cent, a third of whom lived in Oslo (Slettebak 2020). After the enlargement of the European Union (EU) in 2004, Norway experienced an unprecedented increase in immigration, despite Norway not being member of the EU (Cappelen et al. 2011). By 2016, the immigrant population had increased to 13.4 per cent, with Poles being the largest immigrant group (Slettebak 2020). Labour migrants settled in every municipality in Norway – meaning that many rural regions previously unfamiliar with migration have seen the arrival of migrants. This raised concerns about low-wage competition and the potential for increasing social inequality, and with it a perceived potential threat to the Norwegian work–life regime and welfare state (Slettebak 2020; INT-CG-4; INT-CG-6). They noted that there is a rise in symbolic politics, anti-immigrant discourse, and that there is a heavier emphasis on returns (INT-CG-4). OECD data shows that in 2015 there was about a 10 per cent employment gap between foreign-born and native-born individuals in Norway (see Figure 6). By 2040, almost 50 per cent of the low skilled immigrant population may be dependent on working family members or welfare benefits (Economics Norway 2019),

Figure 7. Employment gap between foreign-born and native-born individuals in percentage points, 2015 (Hein et al. 2020)




Linked to this is the fact that over the last 10 years, and particularly since 2015, asylum and immigration policies in Nordic countries have been tightened (INT-CG-3), with governments introducing policies to reduce family reunification, restrict access to refugees, and limit access to public assistance benefits for non-nationals (Widfeldt 2018). There has broadly been a recent rise in right-wing extremism in Norway (INT-CG-1, INT-CG-3, INT-CG-10), but there are also nuances to these developments – such as that the radical-right movement in Norway is very much on the fringe and may not necessarily be more active than in the 1990s (INT-CG-12). Indeed, there were some prominent extreme-right youth subcultures in several Western countries in the 1990s and early 2000s, such as the Boot Boys in Norway, as well as white power music bands and neo-Nazi organisations, such as Vigrid, that appealed to some marginalised youths. However, right-wing extremism appears to no longer be a youth problem (Bjørgo 2019). At the same time, although extreme right-wing activism moved from physical meetings and street activism onto the internet, it may have started returning to Norway's streets in recent years. For instance, the almost military order of the neo-Nazi group Norwegian Resistance Movement, with banners and uniforms, is a new development (Bjørgo 2019).

## Trend 4: The multilateral system and international cooperation, which Norway benefits from, is facing increasing pressure from new and emerging powers

The Ministry of Foreign Affairs states that a key goal for Norwegian foreign policy over the coming years is 'to support binding international cooperation and the multilateral system', which would enable Norway to strengthen its 'ability to address common challenges and safeguard national and global interests' (Ministry of Foreign Affairs 2019a). This White Paper notes that the liberal world order – which has been crucial to the development of the multilateral system, and which has served Norway so well – is now under increasing

pressure from new powers whose conception of international cooperation is not necessarily in line with the values on which the liberal world order is based. There are several major challenges to the international system according to the Ministry of Foreign Affairs (2019a). Firstly, as the economic centre of gravity moves east, the United States of America (USA) and European countries become relatively weaker in the global context. The US–China rivalry will have an impact on international cooperation and the multilateral system. Secondly, multilateral cooperation is challenged when powerful states look to solve problems bilaterally or unilaterally. This may lead to a fragmentation between states, and primarily benefits countries with the power and capacity to impose their worldview. Countries such as Norway will struggle to safeguard their interests in such a context. Thirdly, increased inequality within countries amplifies discontent and distrust in globalisation and the institutions that facilitate it, fuelling critics who see it as a threat to national sovereignty. Fourthly, the multilateral system is currently inadequate to tackle transnational threats, such as terrorism, digital attacks, climate change and pandemics (Ministry of Foreign Affairs 2019a).

This is particularly challenging for Norway because its prosperity and international influence is based on the multilateral system (INT-CG-11). Multilateral institutions such as the United Nations (UN) have played a key role in developing the rules-based international system between states, and smaller countries like Norway particularly rely on there being a set of rules that all nations must follow (Ministry of Foreign Affairs 2019a). Norwegian security is dependent on international cooperation that takes place within organisations such as the North Atlantic Treaty Organisation (NATO) and the UN. One interviewee noted that Norway's NATO membership is crucial to balancing its asymmetric relationship with Russia (INT-CG-1). Indeed, Norway may be described as 'NATO in the North' (Kunz 2018). Moreover, following Russia's annexation of Crimea in 2014, there was a shift in NATO's focus towards collective defence and deterrence within the NATO area rather than out-of-area crises management (Ministry of Foreign Affairs 2017b). Norway is also dependent on European and transatlantic cooperation that is based on shared values and interests (Ministry of Foreign Affairs 2017b). As an open and relatively small economy, Norway depends on open, free and well-functioning markets, meaning that the European Economic Area (EEA) agreement and Norway's membership in the World Trade Organization (WTO) are crucial (Ministry of Foreign Affairs 2019a). One interviewee felt that there is some left-wing opposition to NATO membership within Norway as a result of engagements in Afghanistan and Iraq, and scepticism towards US foreign policy; however, this opposition is largely symbolic (INT-CG-12). This was echoed by an interviewee who felt that neither the government nor the opposition has showed any strong resistance to NATO and that the strategy thus far has been to appease the administration in the USA (INT-CG-1). Another interviewee highlighted the importance of the World Health Organization (WHO) for Norway (INT-CG-11). They said that as the WHO's role has been weakened with the pandemic, Norway is seeking other multilateral arenas to promote global health issues and vaccine development (INT-CG-11)

### Trend 5: Social inequalities in Norway are increasing

Norway has a high level of union membership, which helps to moderate trends towards increased inequality, and has achieved high levels of prosperity while securing comparatively even distribution of income across high- and low-income groups. Nevertheless, there are several social cleavages that are increasing in Norway (INT-CG-1; INT-CG-3; INT-CG-5; INT-CG-6; INT-CG-11). One interviewee highlighted that that there are increasing wage disparities in Norway and rising income inequalities (INT-CG-3).

Globally, income inequality has increased in most developed countries and some middle-income countries since 1990 (United Nations 2020). Income and wealth are increasingly concentrated in the richest one per cent of the global population (United Nations 2020). There are substantial and systematic social inequalities in health in Norway, particularly between educational groups. The Norwegian Institute of Public Health finds that women and men with the highest level of formal education live on average about 5–6 years longer than those with the lowest level of formal education (Norwegian Institute of Public Health 2018). In addition, these health inequalities in Norway are larger than in many other European countries (Norwegian Institute of Public Health 2018). About 80 per cent of the geographic variation in mortality between Norwegian men can be explained by socioeconomic factors, and for women this is about 73 per cent (Kravdal et al. 2015).[8]

Poverty in Norway is increasing, with the share of people in low-income households growing from 9.6 per cent in 2011 to 11.2 per cent in 2017 (Omholt 2019). The proportion of households with persistent low income was stable around 8 per cent for many years, until the period 2010–2012. Since then, the share of households with persistent low income has increased annually (Omholt 2019). The OECD uses a ratio to measure the poverty rate – which is the ratio of the number of people whose income falls below the poverty line; defined as half the median household income of the total population. Using this poverty rate, OECD data shows that in 2004 this was 0.069 – which has risen to 0.084 in 2018 (OECD 2020b).

### Trend 6: Global interconnectedness and interdependence are increasing, with shifts in the prominence of actors in international politics

Globalisation may be defined as the increasing interdependence and connectedness of the world's economies, cultures and populations, driven by cross-border trade in goods and services, technology, and flows of investment, people and information (Peterson Institute for International Economics (PIIE) 2018). While this interconnectedness has brought unparalleled levels of prosperity to many parts of the world, it has also brought with it a sense of anxiety regarding social cohesion and uncertainties about the effects of globalisation (Peterson Institute for International Economics (PIIE) 2018). In recent decades, international events have exposed weaknesses in this global interconnectedness, such as the 2007–2009 Financial Crisis and the COVID-19 pandemic. At the same time, movements around the world have emerged, stemming from this unease with trends in globalisation – such as Britain's decision to withdraw from the European Union, and the 'America First' approach taken by the United States under President Trump (INT-CG-1; INT-CG-11).

The travel restrictions imposed in 2020 to prevent the spread of COVID-19 highlighted Norway's interconnectedness and interdependence. It demonstrated, for example, that Norwegian food production is significantly reliant on immigrants for seasonal low-skilled jobs. The Norwegian Agrarian Association estimates that 20,000–30,000 seasonal workers are needed in Norway (Östling 2020) – and in May 2020, the Norwegian government amended rules to allow seasonal agricultural workers from countries outside the EEA to enter Norway (Ministry of Foreign Affairs 2020).

[8] Worries resulting from inequalities have become particularly acute in a context in which Norway's evolving urban economy has contributed to increased prosperity concentrated at the upper end of the social hierarchy (Galster and Wessel 2018).

At the same time, profound changes are taking place in the global political landscape. Since China joined the World Trade Organization in 2001, its GDP grew at an average rate of 10.5 per cent in the first decade of the new millennium, and its share of world GDP doubled from around 7.5 per cent to 15 per cent between 2001 and 2012 (Wang 2017). In 2021, China's share of GDP adjusted for purchasing-power-parity is estimated to be close to 19 per cent (IMF 2021). The United States has seen the rapid rise of China as a threat to US hegemony (Kwan 2020). In 2018 the USA announced the imposition of sanctions against China, based on Section 301 of the USA Trade Act, which triggered an escalation of the trade dispute between the USA and China (Kwan 2020). China's increasingly important role in international trade regimes both nationally and regionally has an impact on major foreign investments carried out by both Norway and other European actors (Ministry of Foreign Affairs 2017b). The Norwegian government predicts that most economic growth will happen outside of Europe, particularly in parts of Africa and Latin America, which creates new opportunities for the Norwegian business sector (Ministry of Foreign Affairs 2017b).

### Trend 7: The challenges towards democracy and trust are increasing globally

Trust in government is declining across many OECD countries. This poses potential challenges to Norway as trust is necessary for the legitimacy of public institutions and to maintain social cohesion. In particular, during the COVID-19 pandemic, containment, mitigation and recovery have depended on trust in public institutions (OECD 2021). Democracy faces similar challenges globally. For instance, the 2020 Democracy Index[9] decreased from 5.44 in 2019 to 5.37 in 2020. This decline has been explained by the government-imposed restrictions on individual freedoms and civil liberties that resulted from the COVID-19 pandemic (Economist Intelligence Unit 2021). One interviewee also noted that there is more fragmentation globally, with the United Kingdom leaving the EU, Turkey's developments towards the East, Russia becoming more assertive, and with China becoming a growing power with global ambitions (INT-CG-12). As a result, they feel that alliances and coalitions were not as strong globally as they used to be (INT-CG-12). Another interviewee also highlighted that although trust is strong in Norway, Norway should prepare itself for what happens when trust disappears (INT-CG-10). Although these global trends can have an impact on distrust and antidemocracy movements in Norway in the future, levels of trust and democracy in Norway remains stable. Norway has the second highest levels of trust in government of all the OECD countries (OECD 2021). In addition, Norway also scores the highest on the democracy index out of 165 independent states and territories (Economist Intelligence Unit 2021).

[9] The Democracy Index is based on five categories: electoral process and pluralism, the functioning of government, political participation, political culture and civil liberties (Economist Intelligence Unit 2021).

# 3. Barriers to and enablers of cohesion and globalisation-related R&I in Norway

This chapter discusses the main enablers of and barriers to developing the cohesion and globalisation ecosystem in Norway. As with the previous chapter, we have collated evidence from the published literature and also drawn on the insights provided by stakeholders that we interviewed from across academia, industry, government, the third sector, and the RCN.

**Box 2. Summary of key barriers and enablers related to the cohesion and globalisation strategic area**

**Barriers**

- New types of actors contribute to increased international complexity.
- Technology and digitalisation drives changes and can challenge societal values.
- Political and social polarisation is increasing.
- Climate change has a detrimental impact on energy, financial, agricultural and economic security.
- Norway's productivity growth is low and labour force participation is declining, and educational gaps are increasing.
- Global geopolitical instability creates potential threats for Norway.
- Social and economic inequalities create barriers to cohesion.

**Enablers**

- Norway can promote its interests in multilateral institutions through a variety of political and economic means.
- Norway has a high level of union membership, which moderates trends towards inequality.
- Norway ranks highly as a place to do business.
- Norway has achieved a high level of prosperity and a relatively low level of income inequality.
- Norway consistently ranks highly (often first) in measures such as the Social Progress Index, the Human Development Index and the World Happiness Index.
- Trust in institutions is high in Norway.
- Norway has a high level of government spending on education and low youth unemployment.
- Norway is a leader in technology adoption.
- Norway has a strong renewable energy sector.
- Globalisation and internationalisation enhance trade and cultural exchange.

## 3.1. Key barriers

### New types of actors contribute to increased international complexity

New types of actors are becoming more important in international politics, including multinational companies, transnational criminal networks, global civil society networks and militant organisations (Research Council of Norway 2017). This creates increased complexity and offers both opportunities and

challenges for Norway. Norway can look to new partners in civil society or the private sector, but can also be threatened by criminal or militant organisations (Research Council of Norway 2017).[10] In particular, vulnerable states can accelerate these threats, because they increasingly host the threats and have in place political practice that increases support for these actors. Transnational networks and non-state groups can both challenge the world order, whilst cooperating with the actors that make up that world order, such as states (Research Council of Norway 2017).

## Technology and digitalisation drive changes and can challenge societal values

The development of technology and the increasing use of large datasets can create challenges for data protection. It creates a competitive challenge for established businesses, and challenges for regulatory authorities in influencing global net-based platforms (Norwegian Ministry of Local Government and Modernisation 2015; INT-CG-11). The increasing use of technology and digitalisation also creates new types of vulnerabilities that are exacerbated by the gaps between the supply and the demand of advanced ICT competence and skills. The increase in digital security challenges and vulnerabilities is marked by cybercrime and network operations that operate from both state and non-state parties that pose threats to Norway's security and economy (Ministry of Foreign Affairs 2017a). Norwegian society is also becoming increasingly vulnerable with more complex, global and integrated infrastructures and systems (Norwegian Ministries 2019). It is also difficult to forecast which threats might arise in the future due to the speed of the technological evolution, although the Norwegian government predicts that ransomware, industrial espionage, blackmail, identity theft, cyber bullying and sabotage will become more prominent (Norwegian Ministries 2019). For instance, one interviewee noted that technology has become 'so cheap, advanced, and available', for example, bringing along drone technology that was previously unimaginable (INT-CG-8). Another interviewee also felt that it was worrying that other and new state and non-state actors now have a competitive advantage with the development of technology for security (INT-CG-12). One interviewee also highlighted that technology facilitates the development of autonomous weapons systems (INT-CG-1). These threats to Norwegian cyber security have been exacerbated by COVID-19, with actors exploiting COVID-19 as a possibility for fraud and digital operations online (National Security Authority 2020).

## Political and social polarisation is increasing globally

Support for protest movements and protest parties is increasing in a number of countries. Many of these movements and parties are united by a distrust of government and the political system and present threats to international trade, cooperation in NATO and the EU, and can contribute to weakening Europe's ability to take collective action (Ministry of Foreign Affairs 2017b). Increasing polarisation can also make European countries vulnerable to negative external influences such as disinformation campaigns and destabilising activities (Ministry of Foreign Affairs 2017b).

[10] For instance, the Norwegian prime minister has cited terrorism as a potential threat to cohesion on Norway: 'to the south of Europe, vast areas are lawless and ungoverned. Instability has taken hold of a belt that stretches from the Sahel to Afghanistan. […] In the past, instability in areas such as these would have had little direct impact on Europe's security. Today, that is no longer the case. Indeed, terrorist and other criminal networks that thrive in countries affected by conflict and fragility can cause death and destruction far beyond their safe havens. The growing list of European cities that have been hit by terrorism is a sad testimony to the global reach of these groups' (Solberg 2018).

> *'For states, the challenge will, as always, be agreeing on common goals and accountability. Cohesion is more difficult when you cannot meet to share common experiences, build trust and common platforms. The focus should be on the fact that we have a common destiny with regard to climate and that we must work towards everyone living a good and meaningful life.'*
>
> Survey respondent

Although trust in politicians and political institutions is high in Norway,[11] there has been a slight decrease in political trust since 2011. The average trust in all types of political institutions and actors was lower in 2019 compared with 2007 (Haugsgjerd et al. 2019). The only exception is the trust in political parties, which is at the same level (5.0). The decline in trust is more significant on a national than a local level. National politicians, the national government and the political parties received the lowest trust scores in 2019 (5.0) compared with local government that received the highest score (5.8 and 5.7 respectively). The decline in political trust has been attributed to permanent abstainers in elections and increased political polarisation. Those who abstain from voting are often younger, more likely to be male, have a low income and socioeconomic status (Haugsgjerd et al. 2019). For instance, approximately 20 per cent of those who have not completed education beyond primary and lower secondary school abstained in all the last four elections (Haugsgjerd et al. 2019). The most represented group among abstainers are the votes who come from minority backgrounds, where approximately one in four do not vote (Haugsgjerd et al. 2019). The largest decline in trust since 2007 has also been more significant in groups with a lower socioeconomic status (Haugsgjerd & Bock Segaard 2020). Political polarisation comes to the fore in different ways; increasing ideological differences between voting groups, a bigger divide in perceptions of important singular issues and strong negative perceptions of other voting groups (affective polarisation) (Haugsgjerd et al. 2019). Political polarisation and the significant minority of voters who do not participate in elections creates social imbalances in the power and influence of different social groups (Haugsgjerd et al. 2019). Two interviewees also highlighted the role of social media as a structural determinant of political segmentation and destabilisation (INT-CG-1; INT-CG-4).

## Climate change has a detrimental impact on energy, financial, agricultural and economic security

Climate change is considered to be a threat multiplier for global peace and stability. For instance, half of the 20 countries in the world that are most vulnerable to global warming are also affected by armed conflict, particularly in the Horn of Africa, Sahel and the Middle East. Climate change can also not be considered in isolation, but is interlinked with inequality, human rights and gender (Ministry of Foreign Affairs 2021). There is also a relationship between climate change and migration as climate change will increase the likelihood and intensity of natural disasters, which impacts on the drivers of migration (European Parliament 2020). Environmental disasters also tend to disproportionately affect vulnerable populations (European Parliament 2020). There is growing pressure from the public and from politicians across most EU member states for more ambitious action on climate change. This particularly affects Norway as a supplier of energy to the EU, and as a member of the EEA obliged to adopt at least similar binding domestic carbon reduction legislation (Froggatt et al. 2020).

[11] Levels of trust was measured according to a 10-point scale.

For Norway, the increase in greenhouse gas emissions has accelerated climate change in the Artic region. Global warming of the Arctic endangers species and ecosystems that depend on ice and snow. Global warming poses threats to local communities and the way of life and culture of indigenous peoples (Ministry of Foreign Affairs et al. 2021; INT-CC-5). Climate change can also have an impact on security relationships in the High North as the northern coastlines of Russia, Canada and the USA are losing some of the protection that is created by year-round ice. This could result in changes in military and strategic thinking for Norway and their allies (Ministry of Foreign Affairs et al. 2021). Interviewees also felt that the keen interest in and focus on the Arctic is driven by climate change that allows for more activities in the Arctic (INT-CG-8; INT-CG-4). Climate change also creates opportunities for increased commercial activities. For instance, Russia and China have increasingly looked to the Northeast Passage for the transportation of goods (Ministry of Foreign Affairs et al. 2021). However, one interviewee felt that there needs to be a focus on indigenous knowledge as Norway concentrates on economic opportunities and the security relationships in the Arctic (INT-CC-5).

## Norway's productivity growth is low, labour force participation is declining and educational gaps are increasing

Although Norway's labour market is characterised by low unemployment, high incomes and good job quality, productivity growth in Norway is low and labour force participation has been declining. Indeed, Norway is no longer among the top-ranking countries for labour force participation. This demonstrates a weakening of its good record on economic inclusiveness and raises concerns for future growth as Norway's population ages (OECD 2019). Concerns have also been raised by the OECD related to high rates of sickness absence among workers and the high number of disability benefits in Norway (OECD 2019). There are also some important challenges for Norway related to the education system. These include performance gaps between boys and girls, with girls generally performing better, that have become more pronounced in recent years. OECD has also highlighted the low upper secondary completion rates, particularly related to vocational education and training programmes. There are also a relatively small number of low-skilled jobs in the Norwegian labour market, and it is difficult for immigrants with low skills and poor education to have good labour market outcomes (OECD 2020a).

## Global geopolitical instability creates potential threats for Norway

The security and economic stability of Norway is dependent on alliances and cooperation with other countries. With increased uncertainty and instability in the political and military priorities of allies, the EU and in Russia, potential threats for Norway increase (Ministry of Foreign Affairs 2021). For instance, Norway shares land and sea borders with Russia, and is concerned with the security situation and Moscow's activities in the North Atlantic (Kunz 2018; Solberg 2018). Moreover, instability to the south of Europe also has an impact on European and Norwegian security. Instability in these regions increases migratory pressure. Challenges are also exacerbated by climate change and its impact on unpredictability and instability (Ministry of Foreign Affairs 2021). Differing and competing interests between major powers also contributes to undermining collaboration to promote peace and stability. This is accelerated by the ability and willingness of states to pursue their goals through conventional military force, covert operations and cooperation with non-state actors (Ministry of Foreign Affairs 2021).

### Social and economic inequalities create barriers to cohesion

While Norway has a relatively strong record on human rights, the Norwegian National Human Rights Institution (NIM) has noted that there are concerning levels of discrimination against vulnerable groups in Norway, and that there is also a lack of research in this area (NIM 2019). NIM recommends that Norway increases the capacity of authorities to investigate and combat hate speech, especially on social media and other digital platforms (NIM 2019). The problem of violence and abuse is particularly acute in Indigenous Sámi communities, but research indicates that police and support services do not have sufficient expertise in Sámi language and culture to provide practical and effective protection (NIM 2019). In addition, according to the OECD, the integration of low-skilled immigrants into the labour-market requires attention. As there has been an increase in migrants with low education and poor skills – partly due to an increased share of refugees – this has deepened the challenges for labour-market integration policy, especially as demand for low-skill workers is limited in Norway (OECD 2019).

> *'The world will continue to get closer in new ways, although the ongoing pandemic has put everything on pause. The biggest challenges, as I see it, are the same as they have been for a long time; Globalisation affects people unevenly. (It is) all too often based on the exploitation of poor workers and the environment, and thus often reinforces inequalities. At the same time, the black-and-white image is being challenged in interesting ways by the rapid emergence of a new middle class in `southern´ countries. Increasingly, inequalities cut across countries rather than between countries, at least if we focus on middle-income countries.'*
>
> Survey respondent

## 3.2. Key enablers

### Norway can promote its interests in multilateral institutions through a variety of political and economic means

Norway has several levers at its disposal to promote Norwegian and common interests in the multilateral system.

> *'Norway must take global responsibility and focus aid on improving societal structures, research and innovation systems for increased welfare. We must dare to combine business development, research collaboration and aid.'*
>
> Survey respondent

These include international political and financial contributions, partnerships, police and military contributions, candidacies, board memberships and the recruitment of Norwegians to international organisations, such as the EU, NATO and the United Nations, as well as bilateral collaboration with Norway's key allies (Ministry of Foreign Affairs 2019a).

Norway has consistently made the 'Soft Power' 30 list[12] that highlights the strength of Norway's governmental institutions (Portland Communications & USC Center on Public Policy 2021). An example

[12] This is an annual index published by Portland Communications and the USC Center on Public Diplomacy (Portland Communications and USC Center on Public Policy 2021).

of Norway's soft power – and its commitment to and ability to engage successfully in 'international peace brokering' – can be found in the actions of the Norwegian foreign ministry in engaging in 'secret diplomacy' talks that successfully resulted in the Columbian government and the guerrilla movement known as FARC agreeing to 'sit down for peace talks' (NORAD 2018). In addition, on 17 June Norway was elected to the UN Security Council for 2021–2022 (Office of the Prime Minister & Ministry of Foreign Affairs 2020), which one interviewee felt would contribute to Norway's soft power internationally (INT-CG-1).

Norway is not just a member of multilateral organisations such as the UN, NATO, the International Monetary Fund (IMF), the World Bank and WTO, it played a role in establishing them. Thus, Norway has not passively observed the growth of the rules-based world order and multilateral institutions but has actively helped build it (Ministry of Foreign Affairs 2019a). Due in part to Norway's political system and increased defence spending, Norway has risen in NATO to have 'a leadership role within the broader transatlantic security community, and have an impact that is bigger than what one would expect from a country of only 5 million people' (Nordenman 2014). Norway's substantial overseas development assistance (ODA) budget may help explain the strength of its soft power (Nye Jr. 2004; Huq 2019), and Norway remains committed to spend 1 per cent of gross national income on official development assistance. Norway's vision and commitment to development assistance and cooperation are closely aligned to the SDGs and benefit from high-level bipartisan political support (Ministry of Foreign Affairs 2017b).

## Norway has a high level of union membership, which moderates trends towards inequality

Although union membership in Norway has declined since the early 1990s, the rate of unionisation is still high in the Norwegian labour force compared with most other OECD countries (Finseraas et al. 2020; INT-CG-1; INT-CG-6). One interviewee noted that the labour union is a powerful institution in Norway (INT-CG-6). Half of all private sector employees are members of a union, while mean union density[13] is 40 per cent in private sector workplaces. In 2016, of all blue and white-collar workers, membership of trade unions amounted to 52 per cent in Norway, in contrast with 20–30 per cent in most EU countries (Logue 2019). A study on the role of union density in Norway found that union density substantially increases firms' productivity (Barth et al. 2020). The International Labour Organization and the OECD also argues that trade unions are the most important voice for millions of workers worldwide. Together with governments, civil society, international organisations and business, trade unions provide platforms for sharing experiences and good practice related to social dialogue (OECD and International Labour Organization 2018).

## Norway ranks highly as a place to do business

Norway consistent ranks highly in the World Bank's Doing Business report,[14] having been ranked between sixth and eighth position for about 10 years (World Bank 2020). According to the 2020 report, Norway

[13] Mean union density refers to the ratio of wage and salary earners who are trade union members compared with the total number of wage and salary earners in an economy. It is used as a standard measure to 'compare the associational power of trade unions across countries' (Eurofund 2019).

[14] The World Bank Doing Business report aims to provide an objective measure of business regulations and their enforcement in 190 economies and cities globally (World Bank 2020).

demonstrates the best regulatory performance on measures such as the extent of corporate tax transparency and the recovery rate of resolving insolvency (92.9 cents to the dollar) (World Bank 2020). Common features for the economies that score the highest on this ranking also includes aspect such as the widespread use of electronic systems (such as online business incorporation processes, electronic tax filing platforms, and online procedures for property transfers), and strong business regulation that is transparent (World Bank 2020). Scandinavian economies such as Norway are notable for having demonstrated high work effort, small wage differentials, high productivity and a generous welfare state. One explanation for this is that wage compression fuels international investments, and in doing so, increases the average productivity and the average wage for a constant employment level (Barth et al. 2014; OECD 2019).

### Norway has achieved a high level of prosperity and a relatively low level of income inequality

The Nordic countries have been able to achieve a high level of prosperity, while simultaneously securing a more even distribution of income with less difference between high- and low-income groups. The level of income per capita places Nordic countries in the top ranks of OECD nations, along with the USA, Germany, Switzerland and Luxembourg. At the same time, the Nordic countries have a very low degree of income inequality, well below the OECD average (Hein et al. 2020). Low levels of income inequality are driven by a narrow wage distribution and high labour-force participation of women. In addition, as Norway has a system of coordinated annual wage negotiations, Norway is able to deliver wage awards that are consistent with the country's macroeconomic conditions (OECD 2019).

### Norway consistently ranks highly (often first) in measures such as the Social Progress Index, the Human Development Index and the World Happiness Index

Norway is consistently ranked near the top of the Social Progress Index, which measures the provision of basic human needs, foundations of wellbeing and opportunity. Indeed, since the index began in 2014, Norway has been ranked first on this index four times (2020, 2019, 2018 and 2015) (Social Progress Imperative 2020a). This index considers specific factors such as nutrition and basic medical care, water and sanitation, shelter, personal safety, access to basic knowledge, access to information and communication, health and wellbeing, environmental quality, personal rights, personal freedoms and choice, tolerance and inclusion, and access to advanced education (Social Progress Imperative 2020b). Norway was also ranked first in the United Nations Development Programme (UNDP) Human Development Index in 2019 and 2017, which is developed by combining measurements of life expectancy, education and per-capita income (UN Development Programme 2019). The inhabitants of Nordic countries are also some of the happiest in the world, according to the World Happiness Report, which is based on rankings of national happiness based on respondent ratings of their own lives (Helliwell et al. 2020). In the 2020 report, Norway ranked fifth (Helliwell et al. 2020).

### Trust in institutions is high in Norway

Despite many shifts in the global economy, basic trust in institutions has remained high in Nordic countries (Deloitte 2020). More than 60 per cent of respondents in the World Value Survey think that people can be trusted (Ortiz-Ospina & Roser 2016). Indeed, citizen trust in government in Norway has increased from an already high level during this COVID-19 pandemic (Medborgerpanelet 2020). Trust in government, in

the health authorities, in parliament and in national and local politicians has increased, as did trust in the prime minister (Medborgerpanelet 2020). Compared with January 2010, a survey conducted in March 2020 showed that citizen satisfaction with the government had increased from 23 to 49 per cent, with Norwegian politicians from 24 to 43 per cent and with parliament from 41 to 63 per cent (Christensen & Lægreid 2020). Citizen satisfaction with democracy had increased from 57 to 72 per cent, a very high rating internationally (Christensen & Lægreid 2020). Norway is also one of the countries in the Western world that has the highest voter turnout (Haugsgjerd et al. 2019). The high level of trust has been attributed to long democratic traditions, a strong economy, a generous welfare state and a flexible multiparty political system that can accommodate dissent amongst the electorate (Haugsgjerd et al. 2019).

## Norway has a high level of government spending on education, and low youth unemployment

Norwegian government spending on education is amongst the highest as a percentage of GDP globally (OECD 2020a). Norway also has an above-average proportion of the population between 25–64 who have tertiary education (48.2 per cent compared with 44.3 per cent as the OECD average) (OECD 2020a). OECD explains this by the proportion of adults in Norway who have a short-cycle tertiary qualification and that there are a wide range of opportunities for students to enter tertiary education. Norway also has amongst the lowest percentage of NEETs (young people who are neither in employment nor in education or training) (OECD 2020a). In addition, their employment prospects are also higher than those of other OECD countries. However, Norway also faces challenges with gender gaps in earnings (OECD 2020d).

## Norway has strong foundations for technology adoption

Norway is in a strong position with digital transformation, as indicated by the European eGovernment Benchmark and the UN E-Government Survey (OECD & International Labour Organization 2018). Norway has strong foundations for widespread technology adoption in the public sector.[15] For instance, The Digital Agenda of Norway reflects the willingness on the part of the Norwegian government to use technology strategically to streamline inter-agency and sectoral organisational processes, to improve the delivery of public services, accelerate business innovation, and to increase digital inclusion (OECD and International Labour Organization 2018). Interviewees also noted that technology adoption will have an impact on diverse sectors, such as education, leadership and the military (INT-CG-10, INT-CG-7, INT-CG-8). Thanks to its high smartphone penetration rates (76.1 per cent), Norway is a mobile commerce forerunner, in line with its Nordic neighbours (JP Morgan 2019). The Norwegian mobile commerce market is worth €4.26 billion (JP Morgan 2019) . Norway has one of the highest internet penetration rates in Europe, at 99.2 per cent(JP Morgan 2019). Norway was identified as one of nine Northern European countries that are amongst the world's most advanced digital economies (JP Morgan 2019). These countries, so-called 'digital front-runners', score highly on digital integration and have launched numerous public initiatives to boost the digital economy (McKinsey & Company 2017). However, it has been argued that for Norway's position to be sustainable in the long term, it is necessary to create a sense of urgency in the country to maintain a drive for advancement of the digital transformation of the public sector (OECD

[15] Input from the survey of the public.

2017). This could also strengthen Norway's role in regional collaboration mechanisms, including the European Economic Area and the Nordic Council (OECD 2017). Technological development can create new opportunities for political engagement, coordination and communication (Ministry of Local Government and Modernisation 2015).

### Norway has a strong renewable energy sector

Norway has one of the most decarbonised power sectors in Europe. Its renewable resources –primarily hydropower – are an important part of the Nordic power market, helping to balance supply and demand for domestic industry and across the region (Froggatt et al. 2020). However, Norway exports much of its fossil fuel reserves, as oil and gas make up two-thirds of Norway's exports (European Commission 2020). One interviewee felt that the focus on GHG emissions is too strong and that the international community should recognise that Norway is extracting and selling oil and gas products (INT-CG-1).

### Globalisation and internationalisation enhance trade and cultural exchange

The international trading system is of particular importance to Norway, with the agreements with the World Trade Organization (WTO), the EEA and the European Free Trade Area (EFTA) being cornerstones of Norway's policy (Ministry of Foreign Affairs 2015). Indeed, the Norwegian government argued that trade agreements are a means through which Norway can contribute to determining the shape of globalisation through international cooperation (Ministry of Foreign Affairs 2015). This is particularly important for Norway as a small and open economy, where relations to other countries have become ever more important for Norway through labour migration, capital flows and trade (Ministry of Foreign Affairs 2015). Although Norway benefits from strong trade relations with their closest trading partners through the EEA, Norway does not have free trade agreements with many of the 10 largest economies in the world. (Ministry of Foreign Affairs 2015) As there will be shifts in the global economy, it is necessary for the business sector in Norway to access markets in new emerging markets where trade regulations and rules are less developed. Norway's trade policy interests are also increasingly focused on trade in services rather than goods (Ministry of Foreign Affairs 2015).

# 4. Uncertainties and policy challenges associated with transforming cohesion and globalisation in Norway

In this chapter, we discuss the various uncertainties and policy challenges associated with potentially transforming cohesion and globalisation in Norway. Where relevant, and drawing on the evidence from the literature and expert insights, we also present ideas for potential solutions to some of these challenges. As noted previously, to achieve its overarching objectives and strategic-area related vision, the RCN will need to adopt a multi-stakeholder approach of collaborating and engaging with diverse stakeholders in the wider R&I ecosystem in Norway and develop targeted priority missions while also establishing new (or updating existing) underpinning structural measures.

**Box 3. Summary of uncertainties and policy challenges**

**Uncertainties**

- The stability or otherwise of agreements on open international trade.
- The speed of the energy transition from fossil-based fuels to renewable energy.
- The persistence and prominence of far-right political groups.
- The extent of Norway's influence in international change processes.

**Policy challenges and potential solutions**

- COVID-19 and potential challenges to globalisation and cohesion.
- The economic recession following COVID-19.
- Climate change and the green transition in Norway.

## 4.1. Uncertainties

### The stability or otherwise of agreements on open international trade

Norway is a trading nation and support for and dependence on open international trade are key features of Norway's international profile (Ministry of Foreign Affairs 2015a). While the international community is becoming more closely integrated, there is a growing risk that Norway will have reduced influence on the development of the future framework for international trade. There has been a marked increase in regional initiatives and negotiations in recent years, partly in response to a lack of progress in the WTO (Ministry of Foreign Affairs 2015a). As such, Norway is particularly susceptible to global risks to trade.

### The speed of the energy transition from fossil-based fuels to renewable energy

Another uncertainty for Norway involves reducing its dependence on the petroleum sector and planning for the impacts of significantly (and potentially permanently) lower oil and gas prices. This will also involve ensuring the Norwegian oil fund is well managed. Norway's economy and policymaking will suffer if global oil prices remain low for long (SGI 2020). The resource curse hypothesis argues that an 'abundance of natural resources stimulates dysfunctional economic policy choices and rent-seeking' and creates conflicts over the distribution of wealth (Listhaug 2005). Norway has so far managed to use state institutions to effectively manage natural resources and bring them under political control – such as through active

government involvement in oil production, a tax system that ensures the state is well supported by this oil production, and the establishment of the oil fund. However, Listhaug (2005) argues that the state's active involvement in the oil sector increases citizens' expectations of benefits they should receive, and that this has the potential to lead to oil wealth dissatisfaction – which could bring with it a decline in political trust in Norway. In 2019, the OECD argued that Norway's macroeconomic policy faces uncertainty around oil prices, as well as from other external influences from global geopolitical and economic developments – such as Brexit. Oil prices are often highly reactive to economic and political influences, making for a high degree of uncertainty (OECD 2019).

### The persistence and prominence of far-right political groups

It has been noted that whereas before 2011 far right groups moved from the streets to the Internet, far right movements are now moving back to the streets – such as demonstrations from the Stop Islamisation of Norway (SIAN) or the neo-Nazi Nordic Resistance Movement (NRM) (Kvittingen & Nuse 2020). Nationalist groups range from right-wing radicals working within democracy to right-wing extremists who reject democracy and, in some cases, condone the use of violence.

### The extent of Norway's influence in international change processes

Norway's current security situation is more challenging as the world has become more unpredictable (Ministry of Foreign Affairs 2017b). Security and economic stability in Norway depend on alliances and cooperation with other countries. As there are changes in the political and military priorities of allies that are close to Norway, the EU and Russia, as well as the framework for international trade, there is uncertainty around what Norway's influence will be in the changing security landscape. For example, it is uncertain what Norway's influence will be in the Asia-Pacific region. More than half the world's population lives in Asia, and the continent accounts for 25 per cent of the world's GDP and 28 per cent of world trade (Ministry of Foreign Affairs 2019b). Norwegian economic interests in Asia are complex and affect many sectors. More than 600 Norwegian companies have a presence in Asia, which trade within the Asian markets and trade across borders with the Asian markets (Ministry of Foreign Affairs 2019b). The value of Norwegian goods to Asia was NOK 72 billion in 2018 (Ministry of Foreign Affairs 2019b). Norway also entered into a sector dialogue partnership with the Association of Southeast Asian Nations (ASEAN) in 2015, which has given Norway access to an important arena to ensure regional integration and development in Southeast Asia (Ministry of Foreign Affairs 2019a). One interviewee felt that it will be important for Norway to do more research on Asia in the future (INT-CG-9).

## 4.2. Key policy challenges associated with transforming the cohesion and globalisation area

### COVID-19 and potential challenges related to globalisation and cohesion

Some authors argue that the COVID-19 pandemic has led to an acceleration of the defiance of globalisation (Delios, Perchthold, and Capri 2021). For instance, the number of aggressions against people who seem Asian in Europe has increased following the pandemic. This has accelerated common prejudices against immigrants and ethnocentrism. In Norway, voters are also increasingly concerned about immigration and

integration (Stiftung 2020). In addition, already existing tensions and challenges to globalisation have been accelerated by more aggressive rhetoric internationally, the emergence of models for government cooperation and business in major global economies (Delios, Perchthold & Capri 2021). However, they also find that people and organisations can work to achieve cohesion and limit the extent to which globalisation is challenged (Delios, Perchthold & Capri 2021).

> *'The pandemic teaches us that we are a global community. This is a challenge, but also an opportunity for interaction across and beyond "borders". We – humanity – need more initiatives that emphasise the importance of cohesion, this requires other keys for distribution of wealth and abundance.'*
>
> Survey respondent

## The economic recession following COVID-19

The COVID-19 pandemic has created a major challenge for the world's economic activities (World Bank Group 2021; United Nations Conference of Trade and Development 2020). It has led to an unemployment crisis, has widened inequalities and increased the number of people in poverty by 131 million (World Bank Group 2021). In 2020, world output decreased by 4.3 per cent, which was three times higher than during the financial crises of 2009. Developed economies were hit the hardest due to the lockdown measures that were imposed in many countries in Europe (World Bank Group 2021). In Norway, gross national product (GNP) was 4.7 per cent lower than what was predicted before the pandemic hit (Holden 2021). Lockdown also had a severe impact on employment worldwide, with unemployment levels remaining above crisis levels in most countries (World Bank Group 2021). For instance, in Norway, there has been a reduction in employment in all counties (Statistics Norway 2021; Ministry of Finance 2021). Digitalisation, automation and robotisation are predicted to potentially accelerate some of these trends (World Bank Group 2021).

## Climate change and the green transition in Norway

The global community is facing an enormous challenge with reducing greenhouse gas (GHG) emissions (Ministry of Finance 2021). The green transition will induce costs for Norway in the short term, particularly for the oil and gas industry. There is a transition away from fossil fuels towards renewable energy globally. This has significant implications for Norway (Froggatt et al. 2020). Norway is one of the largest exporters of energy. As there will be reduced volumes and lower prices with an accelerated energy transition, oil exporters like Norway now compete in a shrinking market (Froggatt et al. 2020). In addition, the public and political pressure in EU Member States for action on climate change that is ambitious is growing. This has an impact on Norway as a supplier of energy to the EU and as a member of the EEA that has to adopt similar carbon reduction legislation (Froggatt et al. 2020). Moreover, over time, as Norway's income from the oil and gas sector will decrease in the long term, there is increased uncertainty related to the value of the State Pension Fund. This is amplified by lower growth in tax income and increased costs for pensions, health and care, which decreases the flexibility of national budgets in Norway (Ministry of Finance 2021). However, Norway has a relatively strong position as it is one of the most decarbonised sectors in Europe (Froggatt et al. 2020). Norway's renewable sources (hydropower) play an important role in the Nordic energy market (Froggatt et al. 2020). Norway is also likely to expand its role as a supplier of low-carbon electricity in Europe with the building of new power lines to Germany and the United Kingdom (UK) (Froggatt et al. 2020).

# 5. Future scenarios to examine potential missions and structural measures

This chapter presents the scenarios (to 2040) that were developed to examine the future of the different strategic areas and the wider R&I system in Norway. It is important to highlight that the scenarios are not intended to be predictions or forecasts of the future. Instead, they represent a range of plausible future states that have been generated using a combination of factors and future projections of the factors that could reasonably occur together. The scenarios represent a wide spectrum of possible futures that are sufficiently differentiated from each other. A summary of the approach to developing and using the scenarios is provided in Section 1.2 and further elaborated upon in the following sections. A detailed description of the methodology used to develop the scenarios is provided in the accompanying methodology report (Gunashekar et al. 2021c).

## 5.1. Future scenarios to 2040

As noted in Section 1.2, to build scenarios of sufficient depth and distinctiveness, we constructed two scenario sets, by combining various elements associated with the five strategic areas (oceans; green transition; technology and digitalisation; technology and digitalisation; and cohesion and globalisation). Each scenario set comprised four future scenarios based on 15–20 prioritised political, economic, social, technological, legal and environmental (PESTLE) factors from the trend analyses[16] that could influence the strategic areas (specifically, these factors were derived from the trends, enablers, barriers and uncertainties that were identified in the trend analyses).

By having two sets of scenarios, each with a relatively large number of PESTLE factors, we were able to maintain the detail and richness required in the scenarios to support the examination of meaningful missions and policy actions for each of the strategic areas, while at the same time allowing the missions to be set against a broader landscape. Furthermore, with the two sets of scenarios, we were able to effectively deal with the relatively wide-ranging strategic areas of cohesion and globalisation and technology and digitalisation (as well as green transition, to a degree).[17] Below we recap the two scenario sets:

- **Scenario set 1 (*Norway in a national context*):** The first scenario set broadly focuses on Norway in a national context, largely relating to the Norwegian domestic agenda. This scenario set encompasses such themes as health, welfare, education, work and skills, cohesion, and relevant aspects of technology and digitalisation, and it also covers some aspects related to green transition (for example, in relation to the circular economy).

[16] In the first phase of the study, we carried out a detailed trend analysis for each strategic area, by collecting and analysing wide-ranging evidence to help develop a robust knowledge and information base. Specifically, we identified the main trends, enablers, barriers, and uncertainties that will potentially shape the strategic area over the next ten years or so.

[17] These two strategic areas are very interconnected with different sectors, cut across the other strategic areas, and are inter-related with each other as well.

- **Scenario set 2 (*Norway in a global context*):** The second scenario set focuses on Norway in an international or global context, primarily relating to Norway's outward-facing role. It broadly covers themes related to climate, oceans, energy, transport, food, biodiversity and globalisation, as well as relevant aspects of technology and digitalisation.

As noted above, we developed four distinct future scenarios to 2040 for each scenario set. Because of their cross-cutting and wide-ranging nature, the cohesion and globalisation strategic and the technology and digitalisation strategic areas (and to some extent green transition as well), and the corresponding indicative missions were discussed in relation to both scenario sets. The scenarios were used as methodological tools during two foresight workshops to examine a series of indicative priority missions and discuss ideas for potential structural measures.[18] The workshops were attended by a range of diverse stakeholders from across academia, industry, the third sector, and the RCN.

In the sections below, for both scenario sets, we provide the high-level summaries of the corresponding scenarios followed by a table containing the key characteristics and underpinning factors of the four scenarios. In Annex A, we present more detailed one-page narratives of the scenarios that have been developed.[19]

[18] The two workshops covering the two scenario sets – Norway in a national context and Norway in a global context – were organised on 23 and 24 March 2021, respectively.

[19] The scenario narratives were shared with the workshop participants in advance of the workshops and were discussed in detail during the workshops.

## 5.2. Summaries of the scenarios corresponding to future scenario set 1: *Norway in a national context*

*As noted previously, different aspects of the cohesion and globalisation strategic area were covered in both scenario sets and were discussed at both workshops (see Annex A for the full scenario narratives).*

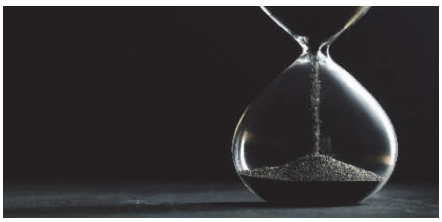
### Scenario 1: Protectionist decline

**Key storyline:** Against a backdrop of global protectionist trends, technology adoption and innovation in Norway's healthcare sector has stalled. Greater national spending on health and welfare has led to some advances in care but has so far failed to deliver a joined-up system. Despite increased growth in some sectors, such as domestic food production, overall productivity growth and labour force participation are low and trust in public institutions is declining.

### Scenario 2: Going green together

**Key storyline:** Sustainability, an inclusive society and local delivery of services are now at the core of Norway's approach. Healthcare has been decentralised, and, in common with other sectors, targeted use of technology is seen as a way to improve efficiency and reduce waste. There has also been a focus on education and digital competence to reduce social inequalities. Open science has been key to the success of green initiatives at the national and local level, from green builds and urban farms, as city living remains popular.

### Scenario 3: Slowly changing society



**Key storyline:** Norway has experienced only gradual change over the past several years. There has been some success in the healthcare sector in responding to more complex needs of a changing population, compounded by the effects of climate change. But limited interdisciplinary collaboration and cooperation with industry, as well as a lack of vision on green initiatives, give rise to concerns that Norway will not have the necessary skills to adapt to future changes in the national and global landscape.

### Scenario 4: Technological trajectory

**Key storyline:** Norway has focused on technological advances to promote economic growth and support its sustainability goals. Digital solutions have been extensively integrated into healthcare. Most Norwegians have internet access, but digital literacy and a willingness to share data are prerequisites for participation in many activities. The technological transformation of employment has also meant many Norwegians have been able to move out of cities to escape effects of climate change.

**Figure 8. Key characteristics and underpinning factors of the four scenarios associated with scenario set 1 *(Norway in a national context)***

| | | Protectionist decline | Going green together | Slowly changing society | Technological trajectory |
|---|---|---|---|---|---|
| Health and welfare | Demand and access to health and welfare services | ↔ | ↑ | ↔ | ↔ |
| | Collaboration and interdisciplinarity | ↓ | ↑ | ↔ | ↑ |
| | Development and adoption of telemedicine and telecare | ↔ | ↑ | ↔ | ↑ |
| Economy and society | Discrimination and hate speech | ↑ | ↓ | ↔ | ↔ |
| | Use of social media to spread disinformation | Increasingly used, with impact on the spread of misinformation | Increasingly used, but little impact on misinformation | Increasingly used, with impact on the spread of misinformation | Increasingly used, with impact on the spread of misinformation |
| | Trust in public administration | ↓ | ↑ | ↔ | ↔ |
| | Net immigration | ↔ | ↓ | ↔ | ↔ |
| | Natural resource wealth | Slow growth or stagnation | Steady growth, with greater share from sustainable sources | Steady growth, but no change in share from sustainable sources | Steady growth, but no change in share from sustainable sources |
| Location of jobs and housing and greening initiatives | Skilled labour availability to match employment demand | ↓ | ↑ | ↔ | ↑ |
| | Location of jobs and housing | More dispersion with mixed transport links | Continued trend for jobs to be located in large cities and transport-friendly locations | Continued trend for jobs to be located in large cities and transport-friendly locations | More dispersion with mixed transport links |
| | Ability of Norway to adapt to environmental change | ↔ | ↑ | ↔ | ↑ |
| | Circular infrastructure for energy, water and waste supply | Focussed on current approaches | Develop rapidly and are implemented at national, regional and local levels | Rapid development, but implementation is localised | Rapid development, but implementation is localised |
| Technology, digital skills and digital threats | Digital skills | Digital divide increases | Digital skills increase, digital divide decreases | Digital skills and digital divide remains as now | Digital divide increases |
| | Digital security and cyber security protection | Norway is unable to respond, digital and cyber security threats demand increase protection | Norway is better able to respond, decreasing digital and cyber security threats | Norway is unable to respond, digital and cyber security threats demand increase protection | Norway is better able to respond, decreasing digital and cyber security threats |
| | Data sharing | ↓ | ↑ | ↑ | ↑ |
| | Technology convergence and use of enabling technologies | ↓ | ↑ | ↔ | ↑ |
| Research and innovation | Globalisation of research and innovation and data sharing | Decrease in international data sharing and collaboration | Increasing international data sharing and collaboration (open and distributed) | Increasing international collaboration and data sharing (closed) | Increasing international data sharing and collaboration (open and distributed) |
| | Funding for research and innovation | Decreases | Sufficient and continuous for different actors | Fragmentation | Sufficient and continuous for different actors |

Source: Study team analysis

## 5.3. Summaries of the four scenarios corresponding to future scenario set 2: *Norway in a global context*

*As noted previously, different aspects of the cohesion and globalisation strategic area were covered in both scenario sets and were discussed at both workshops (see Annex A for the full scenario narratives).*

### Scenario 1: Protectionist decline

**Key storyline:** Political instability has led to a poorly performing global economy and protectionist attitudes towards trade and research and innovation. Even within Norway, there has been little progress so far on initiatives to green the economy, which continues to focus on developing the oceans.

### Scenario 2: Global greening

**Key storyline:** Products and services that have a low impact on the environment and climate are now central to the global economy. Change is being achieved through government-, industry- and consumer-led initiatives, with Norway at the forefront of all of these. There has been a focus on ensuring openness and transparency of research, seen as key to a green future.

### Scenario 3: Slowly shifting power

**Key storyline:** A lack of clear international vision has resulted in slow progress by 2040 on both climate change goals and transformational change from technology convergence, as research remains fragmented. Global trading pattern relationships reflect the steady drift of economic power away from the west, while melting ice in the High North has created commercial opportunities and tensions for Norway.

### Technological trajectory

**Key storyline:** By 2040, technology is all-pervasive: a key driver of economic growth, changing the nature of employment for many and impacting on daily life. Technological advances have not delivered on climate change goals and continue to be resource intensive. Norway is increasingly looking to new international partners for trade and research collaboration.

**Figure 9. Key characteristics and underpinning factors of the four scenarios associated with scenario set 2 *(Norway in a global context)***

| | | Protectionist decline | Global greening | Slowly shifting power | Technological trajectory |
|---|---|---|---|---|---|
| Green transition | Demand and support for circular products | ↓ | ↑ | ↓ | ↔ |
| | Circular infrastructure for energy, water and waste supply | Circular economy remain focussed on current approaches to water/energy/waste | Circular initiatives develop rapidly and implemented at national, regional and local levels | Circular economy remain focussed on current approaches to water/energy/waste | There is rapid development in circular initiatives, but implementation remains localised |
| | Investments/innovations to reduce emissions from oil | ↓ | ↑ | ↔ | ↔ |
| | Ability of Norway to adapt to climate change | ↓ | ↑ | ↓ | ↓ |
| | Food security and supply | Norway maintains security of food supply with higher share of domestic production | Norway maintains security of food supply with higher share of domestic production | Norway maintains security of food supply with same share of productions as now | Norway maintains security of food supply with same share of productions as now |
| | Low-carbon business models (international) | No change in emergence | Rapid emergence | No change in emergence | Emergence in some sectors |
| Oceans | Sustainable aquaculture | Little expansion in aquaculture sector | Expanded aquaculture sector with expanded share of sustainable farming | Expanded aquaculture sector with expanded share of sustainable farming | Expanded aquaculture sector but no increase in share of sustainable farming |
| | Norwegian shipping industry | Greening of international shipping industry remains as now | Greening of international shipping industry is extensive | Greening of international shipping industry remains as now | Greening of the shipping industry increases |
| Globalisation and society | Norway's trade linkages with other countries | ↓ | ↑ | ↔ | ↑ |
| | Norwegian co-operation with EU/EEA | ↓ | ↑ | ↔ | ↑ |
| | Natural resource wealth | Slow growth or stagnation | Steady growth, with greater share from sustainable sources | Steady growth, but no change in share from sustainable sources | Steady growth, but no change in share from sustainable sources |
| | Make up of geopolitical landscape | Less stable with a shift in global power | More stable with greater cooperation with and stability in Norway's partner countries | No change in stability of the geopolitical landscape | No change in the stability of the geopolitical landscape |
| | Natural resource wealth | Slow growth or stagnation in the economy | Steady growth in Norway's wealth with a greater share from sustainable sources | Steady growth in Norway's wealth, but no change in the share from sustainable sources | Steady growth in Norway's wealth, but no change in the share from sustainable sources |
| | Skilled labour availability (to match employment demand) | ↓ | ↑ | ↔ | ↑ |
| | Technology convergence and the use of enabling technologies | ↓ | ↑ | ↔ | ↑ |
| Research and innovation | Globalisation of research and innovation and data sharing | Decrease in international data sharing and collaboration | Increasing international data sharing and collaboration (open and distributed) | Increasing international collaboration and data sharing (closed) | Increasing international data sharing and collaboration (open and distributed) |
| | Funding for research and innovation | Decreases | Sufficient and continuous for different actors | Fragmentation | Sufficient and continuous for different actors |

Source: Study team analysis

# 6. Indicative priority missions to help develop the cohesion and globalisation strategic area

As noted previously, a set of policy levers or actions will be required by the RCN to help steer the R&I system towards its main outcome of interest (i.e. achieving a 'well-functioning research and innovation system') through its three overarching objectives for the current strategy period (i.e. ground-breaking research and radical innovation; sustainable development; and restructuring of the business and public sectors) (Research Council of Norway 2020). Developing a series of strategically selected priority missions – within and across (or even outside) the RCN's five strategic areas – that could potentially be implemented over the next few years could help contribute to this. For this study, we regard missions as targeted, timebound, concrete priority actions to help solve one or more societal challenges that the RCN, together with other stakeholders could consider implementing in the future. These challenge-based missions will help the RCN achieve its overarching objectives (over a roughly ten-year time frame) and eventually contribute to enriching lives locally, nationally and internationally. More generally, missions are systemic policies that operate both as a means of steering economic growth in a particular direction (by, for example, steering investments towards particular societal challenges) and as a tool that can be used to get there (by, for example, setting clear problem-focused objectives) (Mazzucato 2018). Because missions are so closely connected to societal challenges, public purpose and societal impact lie at the heart of missions. They also aim to generate innovation across sectors, actors and disciplines and to enable bottom-up solutions and experimentation across multiple sectors. Missions are challenges that cannot be solved by a single project in research and innovation, but, rather, require a portfolio of interacting projects as well as the implementation of wider policy measures.

In the sections below, we discuss a set of indicative priority missions for the cohesion and globalisation strategic area. As cohesion and globalisation is perhaps the most comprehensively defined of the five strategic areas with an extensive scope (as illustrated in the trends, enablers, barriers, and uncertainties presented above), we have suggested a relatively large number of missions that span many areas. However, several of the mission ideas are also relevant to one or more other strategic areas and are therefore included in the respective strategic area reports. Therefore, some of the indicative missions might focus on a different area (for example, have a stronger link to technology and digitalisation) but are touched on by issues related to cohesion and globalisation. Thus, the areas covered by the missions are also broad and comprehensive, and require actions across a range of different fields, for example, from skills and digitalisation to health and environment.

Drawing on information collected during the trend analyses and expert inputs throughout the study, the mission ideas have been proposed, as far as possible, for areas where Norway has competitive advantages; where its institutional capacities and capabilities are strong; and where national, social, economic or environmental challenges are critical – nationally and where, relevant, internationally. The priority mission ideas we have highlighted are not intended to be definitive and are proposed as indicative ideas at this stage, based on the analysis of the evidence gathered. They represent a broad spectrum of ideas for further consideration and exploration by the RCN and other stakeholders that might be involved in the process to implement potential missions in Norway in the future. Some mission ideas are wide ranging and cover one

or more other strategic areas while others are more specific. Furthermore, some missions overlap and interact with other missions. All the missions will require an active, multi-stakeholder approach in order to be implemented and are cross-cutting in terms of sectors and disciplines involved. In general, their implementation will also need to effectively incorporate relevant social sciences, humanities, legal and ethical perspectives. Finally, the missions must engage the public regularly and be evaluated against a set of clearly defined criteria set out upfront.

A preliminary set of priority missions and associated focus areas were discussed and validated by stakeholders (across academia, industry, the third sector and the RCN) at two foresight workshops to understand their implications (for example, in terms of impact and feasibility) against the RCN's objectives across the different futures exemplified in the scenarios.[20] We also tested the mission ideas in interviews with a selection of stakeholders from academia, industry, the third sector and the public sector. Following the workshops, the indicative missions were refined based on feedback received at the workshops and from the RCN. For each indicative mission presented below, we have also suggested a selection of potential targeted focus areas, in addition to highlighting broad links to the United Nations (UN) Sustainable Development Goals (SDGs) (United Nations 2021),[21] the clusters under Pillar II of Horizon Europe (European Commission 2021a),[22] and other EU missions identified in Horizon Europe (European Commission 2021b).[23] The focus areas[24] are exemplar and are not intended to be definitive; rather they represent a range of potential areas of emphasis in relation to the missions for further consideration by the RCN and other stakeholders. It is important to note that each of the target focus areas presented below will eventually need to be specified with clear, measurable and timebound goals, arrived at by the stakeholders involved in selecting and implementing the missions.

In addition, we have articulated a set of indicative, cross-cutting missions (which are also related to cohesion and globalisation) that are intentionally comprehensive and could apply horizontally to several (and in some cases all the) strategic areas and potentially to other areas of R&I as well. These have been discussed in an accompanying report (Gunashekar et al. 2021a).

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[20] The two workshops covering the two scenario sets – Norway in a national context and Norway in a global context – were organised on 23 and 24 March 2021, respectively.

[21] The UN SDGs are: SDG1: No poverty; SDG2: Zero hunger; SDG3: Good health and well-being; SDG4: Quality education; SDG5: Gender equality; SDG6: Clean water and sanitation; SDG7: Affordable and clean energy; SDG8: Decent work and economic growth; SDG9: Industry, innovation and infrastructure; SDG10: Reduced inequalities; SDG11: Sustainable cities and communities; SDG12: Responsible consumption and production; SDG13: Climate action; SDG14: Life below water; SDG15: Life on land; SDG16: Peace, justice and strong institutions; and SDG17: Partnerships for the goals.

[21] The Horizon Europe Clusters under Pillar II includes: (1): Health; (2): Culture, Creativity and Inclusive Society; (3): Civil Security for Society; (4): Digital, Industry and Space; (5): Climate, Energy and Mobility; and (6): Food, Bioeconomy, Natural Resources, Agriculture and Environment.

[22] The Horizon Europe Clusters under Pillar II includes: (1): Health; (2): Culture, Creativity and Inclusive Society; (3): Civil Security for Society; (4): Digital, Industry and Space; (5): Climate, Energy and Mobility; and (6): Food, Bioeconomy, Natural Resources, Agriculture and Environment.

[23] Five EU mission areas have currently been proposed as part of Horizon Europe: (i) Conquering Cancer: Mission Possible; (ii) A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030; (iii) Mission Starfish 2030: Restore our Ocean and Waters; (iv) 100 Climate-Neutral Cities by 2030 – By and for the Citizens; and (v) Caring for Soil Is Caring for Life.

[24] To varying degrees, the missions and focus areas capture evidence analysed during the trend analyses. Specifically, we analysed the key trends, barriers, enablers and uncertainties identified in the trend analysis to suggest potential areas of focus for each priority mission.

Finally, it is important to note that the priority missions will need to be developed and built on top of a set of robust and coordinated structural measures in the Norwegian R&I environment. Structural measures will address the performance of the Norwegian R&I system in terms of the three overarching objectives of the RCN for the current strategy period. Establishing new and/or strengthening existing underpinning structural measures will enable the development of a resilient, inclusive and thriving R&I environment in Norway within which the missions can be effectively and efficiently implemented in the future. We have proposed a series of potential structural measures in an accompanying report (Skjoldager et al. 2021c).

In Box 4 below, we summarise the indicative missions (and corresponding exemplar targeted focus areas) for the cohesion and globalisation strategic area and from Section 6.1.1 onwards, we present details of the missions using a standard template (in Box 5, we provide a key to the missions template). In Annex B, we present an infographic that provides a high-level overview of *all* the indicative mission ideas that have been articulated within and across the RCN's five strategic areas (oceans; green transition; health and welfare; technology and digitalisation; and cohesion and globalisation).

### Box 4. Summary of indicative missions and corresponding exemplar targeted focus areas related to the cohesion and globalisation strategic area[25]

- ***Indicative mission 1:*** **Preserve and secure a resilient and robust democracy for future Norwegian generations that is characterised by high levels of trust and transparency**
  ***Exemplar targeted focus areas:*** Proactively facilitate broad-based political participation of Norwegian publics (e.g. by increasing voter turnout and representativeness); strengthen efforts to protect electoral processes (e.g. free and fair elections); increase transparency of targeted political content; support media freedom and pluralism; enhance efforts to counter the spread of disinformation; improve media literacy; ensure inclusive and participatory decision making at all levels; reduce segregation in the labour market; eliminate discrimination against migrants (e.g. in the labour market); and increase investment in R&I activities to better understand conditions to preserve an inclusive and diverse society.
- ***Indicative mission 2:*** **Establish Norway as a knowledge leader in global change processes, development and international relations**
  ***Exemplar targeted focus areas:*** Develop actionable insights (e.g. through evidence-based research) into and better understanding of international governance/leadership structures and how such issues as emergencies, conflict and other humanitarian crises affect the Norwegian and global population (and the potential links among these); mobilise governments, organisations and communities to test innovative solutions and new ideas to tackle these and other issues; promote fair and equitable partnerships; build capacity at all levels to increase the number of people in the Norwegian workforce who work in international organisations (e.g. in peacekeeping and international development); and stimulate broad participation and strengthen constructive cooperation/collaboration at the global and regional levels.
- ***Indicative mission 3:*** **Ensure decent work for all people in Norway**
  ***Exemplar targeted focus areas:*** Promote and accelerate inclusive, diverse and decent work for all people in Norway across all segments of the population (including integration of immigrants into the labour market); increase youth employment; improve quality of work, working conditions, job satisfaction, etc.; ensure equal access; and achieve productive employment for the Norwegian workforce that can adapt to digitalisation/automation.
- ***Indicative mission 4:*** **Actively enable digital transformation at all levels of government in Norway**
  ***Exemplar targeted focus areas:*** Make better and more responsible use of a range of digital technologies, data and platforms as enablers of public services at both local and national level (to deliver more targeted, inclusive and user-centric services); improve operations, work processes, productivity, user experience, accountability, and transparency (and reduce risks); promote activities and behaviours that involve the responsible use of data and evidence to inform decision making; proactively focus on workforce development related to developing and maintaining skills (digital and soft); and promote cooperation/collaboration within and across ministries/municipalities and with other stakeholders (including the private sector) (e.g. to share learnings, to share good practice, to build capacity).

[25] As noted above, due to the wide-ranging nature and scope of the cohesion and globalisation strategic area, these missions span many areas. Some of the missions might have a focus in a different area (e.g. a stronger link to the technology and digitalisation strategic area) but are touched on by issues related to cohesion and globalisation. These areas covered by the missions are broad and comprehensive and require actions across a range of different fields from skills and digitalisation to health and environment.

- *Indicative mission 5:* Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce
  *Exemplar targeted focus areas:* Progressively reduce and eliminate the shortage in advanced digital and soft skills, training and competencies, to enable people to work in and adapt to the rapidly evolving digital economy in Norway and globally (including upskilling and reskilling workers); and lead the way and demonstrate knowledge leadership in ensuring equal opportunities, eliminating disparities and overcoming bias and systemic barriers for all segments of the population working in the digital economy (e.g. women, minority ethnic communities, older people, the young workforce, disabled people).
- *Indicative mission 6:* Make Norway's (largest) cities climate neutral
  *Exemplar targeted focus areas:* Further reduce (X% reduction in) greenhouse gas emissions in key sectors across Norway's (largest) cities, aimed at ultimately achieving carbon neutrality; and implement sustainable, greener, resource-efficient and inclusive measures (for example, in relation to land use and transport, energy use in the built environment, consumption and waste, and adaptation to climate change).
- *Indicative mission 7:* Improve the quality of life and health of an ageing society in Norway
  *Exemplar targeted focus areas:* Ensure that people in Norway can live longer lives (e.g. X extra years) healthily and independently while reducing the inequalities between different parts of society; increase the number of healthcare personnel with relevant skills and capabilities to support an ageing population (and ensure the retention of these personnel); increase the adoption of relevant technologies and related services that contribute to healthier and independent living for the elderly (including helping with social connectedness and other areas related to improving quality of life); and ensure adequate support structures are established and available to all segments of Norwegian society.
- *Indicative mission 8:* Accelerate the transition to a sustainable and circular economy in Norway
  *Exemplar targeted focus areas:* Develop a sustainable and substantially circular economy in Norway, with progressively diminishing use of resources (X% reduction in resource use) as Norway progresses towards that target; improve circular business models and resource efficiency; reduce the extent of and dependence on extraction (e.g. of metals, minerals, fossil fuels); improve supply security; increase consumer awareness of the circular economy; create a strong repair, reuse and recycling economy; and improve circularity across specific sectors (e.g. housing, nutrition, mobility, services, consumables, healthcare and communication).
- *Indicative mission 9:* Play a leading role in tackling antimicrobial resistance (in Norway and globally) and actively share expertise
  *Exemplar targeted focus areas:* Put in place systems to improve the effective diagnosis and surveillance of antibiotic-resistant infections and antibiotic use in Norway and internationally; contribute to further reducing the demand for (new) antibiotics; provide thought leadership to help improve awareness and understanding of antimicrobial resistance; actively share experiences, approaches and expertise in combating antimicrobial resistance internationally; and actively invest in developing alternatives to current antibiotics.

- *Indicative mission 10:* Establish a resilient and sustainable blue economy in Norway
  *Exemplar targeted focus areas:* Increase the sustainable use of ocean-based resources to achieve economic growth in Norway; preserve (and improve) the health of the coastal and marine environment around Norway; actively invest in ocean mapping and ocean management programmes; strengthen Norway's (international) position and expertise with regard to ocean ecosystems (including ocean governance); put Norway at the forefront of R&I activities associated with key sectors of strength (such as aquaculture, fisheries, petroleum and shipping); minimise the impacts of ocean acidification; examine and invest in opportunities for offshore renewable energy to enable coastal and maritime markets in the long term; actively support efforts to promote oceans as a sustainable and safe source of food; and ensure the inclusion and active participation of all societal groups.
- *Indicative mission 11:* Position Norway as a global leader in combating marine pollution and establish Norwegian ocean ecosystems free of marine pollution
  *Exemplar targeted focus areas:* Leverage Norway's world-leading ocean management capabilities and expertise to substantially reduce the amount of marine pollution and hazardous substances (including plastics) entering the ocean environment around Norway (including those arising from land-based activities); remove/clean up marine pollutants (including plastics) that are already present in the ocean; spearhead international efforts in reducing global marine pollution; and reduce greenhouse gas emissions from marine activities, such as domestic shipping and fisheries.
- *Indicative mission 12:* Protect, value and restore Norwegian biodiversity and reduce its degradation and loss
  *Exemplar targeted focus areas:* Significantly reduce (X% reduction) and ultimately halt biodiversity loss in Norway's natural environment and farther afield that might result from Norwegian activities; actively engage in activities and play a leading role in actions and decision making that help sustainably use, conserve and appropriately restore well-functioning, diverse and healthy natural land and water ecosystems (e.g. through environmental conservation and ecological restoration activities, such as rewilding); promote growth of the green economy; and promote the importance of and integrate biodiversity values into national and international planning and activities.
- *Indicative mission 13:* Play a leading role in Norway and internationally to substantially increase the use of renewable energy in a sustainable and long-lasting manner and accelerate R&I in this area
  *Exemplar targeted focus areas:* Improve energy security by substituting fossil fuels with renewable sources across all sectors; improve access to modern, reliable and cost-effective clean energy sources across all segments of the population; substantially improve energy efficiency (e.g. in the built environment); accelerate R&I and increase public and private sector investment in renewable energy infrastructure and technology; mobilise knowledge exchange and cross-sectoral/international collaboration (e.g. to share lessons, reduce duplication); and provide thought leadership to help improve awareness and understanding.

### Box 5. Key to the mission templates presented below

- **Key challenges that the mission aims to address:** Details some of the challenges that the mission will contribute to addressing.
- **Exemplar targeted focus areas:** Lists a selection of potential targeted focus areas for the mission. Implementing the priority missions will require the design and implementation of a portfolio of diverse projects involving multiple stakeholders, ideally, as noted previously, in areas where Norway demonstrates strengths and has competitive advantages. The exemplar targeted focus areas could be used to inform the development of potential R&I projects. Furthermore, it is important to note that each of the target focus areas will need to be specified with clear, measurable and timebound goals that are decided by the stakeholders involved in implementing the mission.
- **Links to the RCN strategic areas:** Specifies the links to the strategic area(s) identified in the RCN's current strategy for the next ten years (Research Council of Norway 2020).
- **Links to UN Sustainable development goals (SDGs):** Specifies the UN SDG(s) that the priority mission is linked to (United Nations 2021).
- **Links to clusters of Horizon Europe's Global Challenges pillar (Pillar II):** Specifies the cluster(s) within Pillar II of Horizon Europe) (Global Challenges and European Industrial Competitiveness) that the mission is linked to (European Commission 2021a).
- **Intersection with other priority missions:** Specifies the other indicative priority mission(s) that the priority mission is interconnected with.
- **Involvement of key stakeholders:** Implementing this priority mission will require targeted research, innovation and investment from the RCN and other potential stakeholders (e.g. the public sector; the private sector and industry; civil society organisations; citizens). Importantly, it will also necessitate catalysing active cooperation and collaboration among these diverse stakeholders (including public engagement). In this section, we list some of these potential key stakeholders.

### 6.1.1. Priority mission area 1: Preserve and secure a resilient and robust democracy for future Norwegian generations that is characterised by high levels of trust and transparency

| Key challenges that the mission aims to address[26] | |
|---|---|
| • Strengthening Norway's outcomes in the categories for quality of democracy, electoral processes, access to information, rule of law, civil rights and political liberties;<br>• Decreasing gender segregation and other discrimination;<br>• Decreasing corruption in overseas Norwegian business activities;<br>• Maintaining strong public trust in Norway;<br>• Improving media literacy; and<br>• Improving transparency of political content. | |
| **Exemplar targeted focus areas** | |
| • Proactively facilitate broad-based political participation of Norwegian publics (e.g. by increasing voter turnout and representativeness);<br>• Strengthen efforts to protect electoral processes (e.g. free and fair elections);<br>• Increase transparency of targeted political content; support media freedom and pluralism; enhance efforts to counter the spread of disinformation;<br>• Improve media literacy;<br>• Ensure inclusive and participatory decision making at all levels;<br>• Reduce segregation in the labour market;<br>• Eliminate discrimination against migrants (e.g. in the labour market); and<br>• Increase investment in R&I activities to better understand conditions to preserve an inclusive and diverse society. | |
| **Links to RCN Strategic Areas** | **Links to UN SDGs** |
| • Cohesion and globalisation (primary link) | • SDG 1: No Poverty<br>• SDG 5: Gender Equality<br>• SDG 8: Decent Work and Economic Growth<br>• SDG 10: Reduced Inequalities<br>• SDG 16: Peace, Justice and Strong Institutions |
| **Links to clusters of Horizon Europe's Global Challenges pillar** | **Links to EU mission areas identified in Horizon Europe** |
| • Culture, Creativity and Inclusive Society<br>• Civil Security for Society | • A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030 |
| **Intersection with other priority mission(s) identified in this study** | |
| • Ensure decent work for all people in Norway<br>• Establish Norway as a knowledge leader in global change processes, development and international relations<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce<br>• Actively enable digital transformation at all levels of government in Norway | |
| **Involvement of key stakeholders** | |
| • All sectors<br>• Norwegian higher education institutions and research organisations<br>• International organisations (e.g. United Nations (i.e. United Nations Development Programme and the Security Council), World Bank, International Labour Organisation, World Health Organization, European Commission, OECD, International Organization for Democracy and Human Rights)<br>• National government agencies (Norwegian Agency for Development Cooperation, Ministry of Foreign Affairs, Norwegian Investment Fund for Developing Countries, Industrial Development Corporation of Norway)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Amnesty International Norge, CISV Norge, Norwegian Helsinki Committee, Compassion Norge, Europabevegelsen Norge, Kirkens Nødhjelp, Foreningen Norden, Norsk Folkehjelp, Stiftelsen Flyktninghjelpen)<br>• The Research Council of Norway and Innovation Norway | |

[26] See, for example, Ministry of Finance (2018); Kleven (2016); Stiftung (2020); Funka (2021); Christensen and Lægreid (2020).

### 6.1.2. Priority mission area 2: Establish Norway as a knowledge leader in global change processes, development and international relations

| Key challenges that the mission aims to address[27] | |
|---|---|
| • Improving understanding of international governance/leadership structures;<br>• Improving understanding of international challenges and solutions;<br>• Increasing mobilisation to test solutions and ideas;<br>• Building capacity;<br>• Increasing the number of Norwegians working in international organisations; and<br>• Improving participation and constructive cooperation/collaboration. | |
| **Exemplar targeted focus areas** | |
| • Develop actionable insights into (e.g. through evidence-based research) and better understanding of international governance/leadership structures and how such issues as emergencies, conflict and other humanitarian crises affect the Norwegian and global population (and the potential links among these);<br>• Mobilise governments, organisations and communities to test innovative solutions and new ideas to tackle these and other issues;<br>• Promote fair and equitable partnerships;<br>• Build capacity at all levels to increase the number of people in the Norwegian workforce who work in international organisations (e.g. in peacekeeping and international development); and<br>• Stimulate broad participation and strengthen constructive cooperation/collaboration at the global and regional levels. | |
| **Links to RCN Strategic Areas** | **Links to UN SDGs** |
| • Cohesion and globalisation (primary link) | • SDG 16: Peace, Justice and Strong Institutions |
| **Links to clusters of Horizon Europe's Global Challenges pillar** | **Links to EU mission areas identified in Horizon Europe** |
| • Culture, Creativity and Inclusive Society<br>• Civil Security for Society | • A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030 |
| **Intersection with other priority mission(s) identified in this study** | |
| • Preserve and secure a resilient and robust democracy for future Norwegian generations that is characterised by high levels of trust and transparency<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce<br>• Actively enable digital transformation at all levels of government in Norway | |
| **Involvement of key stakeholders** | |
| • Sectors (e.g. public sector, workplace, education, voluntary/civic sector, civil society)<br>• Norwegian higher education institutions and research organisations<br>• International organisations (e.g. United Nations (i.e. United Nations Development Programme and the Security Council), World Bank, International Labour Organisation, World Health Organization, European Commission, OECD, International Organization for Democracy and Human Rights, Industrial Development Corporation of Norway)<br>• National government agencies (Norwegian Agency for Development Cooperation, Ministry of Foreign Affairs, Norwegian Investment Fund for Developing Countries)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Amnesty International Norge, CISV Norge, Norske Helsingforskomite, Compassion Norge, Europabevegelsen Norge, Kirkens Nødhjelp, Foreningen Norden, Norsk Folkehjelp, Stiftelsen Flyktninghjelpen)<br>• Research Council of Norway and Innovation Norway | |

[27] See, for example, Ministry of Foreign Affairs (2019a).

### 6.1.3. Priority mission area 3: Ensure decent work for all people in Norway

| Key challenges that the mission aims to address | |
|---|---|
| • Increasing youth employment;<br>• Improving integration of immigrants into the labour market;<br>• Improving aspects of work, such as quality of work, working conditions, job satisfaction;<br>• Improving equal access to the employment market; and<br>• Improving productive employment. | |
| **Exemplar targeted focus areas** | |
| • Promote and accelerate inclusive, diverse and decent work for all people in Norway across all segments of the population (including integration of immigrants into the labour market);<br>• Increase youth employment;<br>• Improve quality of work, working conditions, job satisfaction, etc.;<br>• Ensure equal access; and<br>• Achieve productive employment for the Norwegian workforce that can adapt to digitalisation/automation. | |
| **Links to RCN Strategic Areas** | **Links to UN SDGs** |
| • Cohesion and globalisation (primary link)<br>• Health and welfare<br>• Oceans<br>• Green transition<br>• Technology and digitalisation | • SDG 4: Quality education<br>• SDG 8: Decent work and economic growth |
| **Links to clusters of Horizon Europe's Global Challenges pillar** | **Links to EU mission areas identified in Horizon Europe** |
| • Culture, Creativity, and Inclusive Society | • A Climate Resilient Europe – Prepare Europe for climate disruptions and accelerate the transformation to a climate resilient and just Europe by 2030 |
| **Intersection with other priority mission(s) identified in this study** | |
| • Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce | |
| **Involvement of key stakeholders** | |
| • All sectors<br>• Norwegian higher education institutions and research organisations<br>• International organisations (e.g. World Bank, International Labour Organisation, European Commission, OECD, United Nations Development Programme, International Organisation of Employers)<br>• National government agencies (Ministry of Research and Education, Ministry of Labour and Social Affairs, Norwegian Labour and Welfare Administration, Ministry of Children and Families, Industrial Development Corporation of Norway)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations)<br>• Research Council of Norway and Innovation Norway | |

### 6.1.4. Priority mission area 4: Actively enable digital transformation at all levels of government in Norway

| Key challenges that the mission aims to address | |
|---|---|
| • Countering the fragmented implementation of digital technologies across the public sector;<br>• Providing key institutional actors with the means to promote the use of common guidelines, standards and digital solutions in different policy sectors;<br>• Responding to changing citizen and business needs and expectations;<br>• Strengthen coordination and synergies with local government;<br>• Increasing the priority assigned to the development of digital and data-related leadership and skills; and<br>• Simplifying and streamlining data-sharing practices. | |
| **Exemplar targeted focus areas** | |
| • Make better and more responsible use of a range of digital technologies, data and platforms as enablers of public services at both local and national level (to deliver more targeted, inclusive and user-centric services);<br>• Improve operations, work processes, productivity, user experience, accountability and transparency (and reduce risks);<br>• Promote activities and behaviours that involve the responsible use of data and evidence to inform decision making;<br>• Proactively focus on workforce development related to developing and maintaining skills (digital and soft); and<br>• Promote cooperation/collaboration within and across ministries/municipalities and with other stakeholders (including the private sector) (e.g. to share learnings, to share good practice, to build capacity). | |
| **Links to RCN Strategic Areas** | **Links to UN SDGs** |
| • Technology and digitalisation (primary link)<br>• Cohesion and globalisation<br>• Health and welfare<br>• Oceans<br>• Green transition | • SDG 4: Quality Education<br>• SDG 9: Industry, Innovation and Infrastructure<br>• SDG 16: Peace, Justice and Strong Institutions |
| **Links to clusters of Horizon Europe's Global Challenges pillar** | **Links to EU mission areas identified in Horizon Europe** |
| • Culture, Creativity and Inclusive Society<br>• Digital, Industry and Space | • Conquering Cancer: Mission Possible<br>• A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030<br>• Mission Starfish 2030: Restore our Ocean and Waters<br>• 100 Climate-Neutral Cities by 2030 – By and for the Citizens<br>• Caring for Soil Is Caring for Life |
| **Intersection with other priority mission(s) identified in this study** | |
| All indicative priority missions | |
| **Involvement of key stakeholders** | |
| • All sectors<br>• Norwegian higher education institutions and research organisations<br>• Norwegian national agencies (e.g. Difi – Agency for Public Management and eGovernment, Norwegian Association of Local and Regional Authorities, Ministry of Local Government and Modernisation, Ministry of Finance, Ministry of Research and Education, Agency for Financial Management, Industrial Development Corporation of Norway)<br>• International organisations (e.g. United Nations, World Bank, OECD, European Commission, World Economic Forum)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations)<br>• Research Council of Norway and Innovation Norway | |

### 6.1.5. Priority mission area 5: Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce

| Key challenges that the mission aims to address | |
|---|---|
| • Ensuring that the education systems adapts to developments in the digital economy;<br>• Filling skills gaps in key industries, including (but not limited to) healthcare, financial services and retail;<br>• Ensuring the effective use of skills;<br>• Ensuring the active supply of skills;<br>• Contributing to the governance arrangements of Norway's skills system;<br>• Engaging stakeholders in the entire policy cycle; and<br>• Building integrated information systems. | |
| **Exemplar targeted focus areas** | |
| • Progressively reduce and eliminate the shortage in advanced digital and soft skills, training and competencies, to enable people to work in and adapt to the rapidly evolving digital economy in Norway and globally (including upskilling and reskilling workers); and<br>• Lead the way and demonstrate knowledge leadership in ensuring equal opportunities, eliminating disparities and overcoming bias and systemic barriers for all segments of the population working in the digital economy (e.g. women, minority ethnic communities, older people, the young workforce, disabled people). | |
| **Links to RCN Strategic Areas** | **Links to UN SDGs** |
| • Technology and digitalisation (primary link)<br>• Cohesion and globalisation<br>• Health and welfare<br>• Oceans<br>• Green transition | • SDG 4: Quality Education<br>• SDG 5: Gender Equality<br>• SDG 8: Decent Work and Economic Growth<br>• SDG 9: Industry, Innovation and Infrastructure<br>• SDG 16: Peace, Justice and Strong Institutions |
| **Links to clusters of Horizon Europe's Global Challenges pillar** | **Links to EU mission areas identified in Horizon Europe** |
| • Culture, Creativity and Inclusive Society<br>• Digital, Industry and Space | • Conquering Cancer: Mission Possible<br>• A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030<br>• Mission Starfish 2030: Restore our Ocean and Waters<br>• 100 Climate-Neutral Cities by 2030 – By and for the Citizens<br>• Caring for Soil Is Caring for Life |
| **Intersection with other priority mission(s) identified in this study** | |
| All indicative priority missions | |
| **Involvement of key stakeholders** | |
| • All sectors<br>• Norwegian higher education institutions and research organisations<br>• Norwegian national agencies (e.g. Ministry of Labour and Social Affairs, Ministry of Local Government and Modernisation, Ministry of Education and Research, Sami Parliament, Industrial Development Corporation of Norway)<br>• International organisations (e.g. United Nations, World Bank, OECD, European Commission, World Economic Forum)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations)<br>• Research Council of Norway and Innovation Norway | |

### 6.1.6. Priority mission area 6: Make Norway's (largest) cities climate neutral

| Key challenges that the mission aims to address[28] | |
|---|---|
| • Reducing GHG emissions through urban planning and housing development;<br>• Improving urban environments;<br>• Counteracting the negative effects of climate change;<br>• Improving land use and energy efficiency in buildings;<br>• Improving consumption and waste practices; and<br>• Improving adaptation to climate change. | |
| **Exemplar targeted focus areas** | |
| • Further reduce (X% reduction in) greenhouse gas emissions in key sectors across Norway's (largest) cities, aimed at ultimately achieving carbon neutrality; and<br>• Implement sustainable, greener, resource-efficient and inclusive measures (for example, in relation to land use and transport, energy use in the built environment, consumption and waste, and adaptation to climate change). | |
| **Links to RCN Strategic Areas** | **Links to UN SDGs** |
| • Green transition (primary link)<br>• Cohesion and globalisation<br>• Technology and digitalisation | • SDG 7: Affordable and Clean energy<br>• SDG 11: Sustainable Cities and Communities<br>• SDG 13: Climate Action |
| **Links to clusters of Horizon Europe's Global Challenges Pillar II** | **Links to EU mission areas identified in Horizon Europe** |
| • Climate, Energy and Mobility | • A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030<br>• 100 Climate-Neutral Cities by 2030 – By and for the Citizens |
| **Intersection with other priority mission(s) identified in this study** | |
| • Accelerate the transition to a sustainable and circular economy in Norway<br>• Significantly reduce Norway's transport-related emissions<br>• Play a leading role in Norway and internationally to substantially increase the use of renewable energy in a sustainable and long-lasting manner and accelerate R&I in this area<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce<br>• Actively enable digital transformation at all levels of government in Norway | |
| **Involvement of key stakeholders** | |
| • Sectors (e.g. energy, transport, food, environment, technology, building, construction, hospitality, retail)<br>• Norwegian national agencies (e.g. Ministry of Trade, Industry and Fisheries, Ministry of Transport, Ministry of Climate and Environment, Ministry of Petroleum and Energy, Ministry of Finance, Ministry of Local Government and Modernisation, Waste Norway, Bane Nor, Norwegian Climate and Pollution Agency, Norwegian Association of Local and Regional Authorities, Industrial Development Corporation of Norway)<br>• International organisations (e.g. United Nations Environmental Assembly, World Bank, OECD, European Commission, World Economic Forum)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Miljøagentene, Norges Naturvernforbund, Norsk Friluftsliv, Natur og Ungdom)<br>• Research Council of Norway and Innovation Norway | |

[28] Although the focus of this mission is on factors related to the green transition (and incorporates aspects of technology and digitalisation and cohesion and globalisation), the mission could be designed and implemented in such a way that it would also encompass key issues related to the urban–rural divide and to connectivity and cohesion among Norway's (largest) cities and rural areas.

### 6.1.7. Priority mission area 7: Improve the quality of life and health of an ageing society in Norway

| Key challenges that the mission aims to address[29] | |
|---|---|
| • Providing solutions to the demographic challenges that Norway faces in the coming years;<br>• Ensuring that Norwegians can stay independent for longer;<br>• Ensuring that Norwegians can participate through their employment and their communities and can remain connected to others in society;<br>• Ensuring that solutions for the ageing population are spread out across Norway's regions;<br>• Ensuring a reduction in chronic diseases among the elderly; and<br>• Improving the balance between demand and supply of health and care workers on a national level. | |
| Exemplar targeted focus areas[30] | |
| • Ensure that people in Norway can live longer lives (e.g. X extra years) healthily and independently while reducing the inequalities between different parts of society;<br>• Increase the number of healthcare personnel with relevant skills and capabilities to support an ageing population (and ensure the retention of these personnel);<br>• Increase the adoption of relevant technologies and related services that contribute to healthier and independent living for the elderly (including helping with social connectedness and other areas related to improving quality of life); and<br>• Ensure adequate support structures are established and available to all segments of Norwegian society. | |
| Links to RCN Strategic Areas | Links to UN SDGs |
| • Health and welfare (primary link)<br>• Cohesion and Globalisation | • SDG 3: Good Health and Well-being<br>• SDG 10: Reduced Inequalities |
| Links to clusters of Horizon Europe's Global Challenges Pillar II | Links to EU mission areas identified in Horizon Europe |
| • Health<br>• Culture, creativity and inclusive society | • Conquering Cancer: Mission Possible |
| Intersection with other indicative priority mission(s) identified in this study | |
| • Actively address the impacts of non-communicable diseases in Norway<br>• Substantially reduce the prevalence and impact of mental illness in Norway<br>• Establish Norway as a global knowledge leader in personalised medicine and healthcare<br>• Accelerate people-centred, data-driven strategies to digitally transform and improve Norway's health and welfare system<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce<br>• Actively enable digital transformation at all levels of government in Norway | |
| Involvement of key stakeholders | |
| • Sectors (e.g. health, social care, life sciences, pharmaceuticals, technology, education and learning, finance, transport)<br>• Norwegian higher education institutions and research organisations<br>• International organisations (e.g. World Health Organization, OECD, European Commission, United Nations)<br>• National government health agencies (e.g. Ministry of Health and Care Services, Norwegian Institute of Public Health, Norwegian Medicines Agency, Norwegian Directorate of Health, Norwegian Association of General Medicine, Norwegian Data Protection Authority, Central Norway Pharmaceutical Trust, Northern Norway Regional Health Authority, Southern and Eastern Norway Regional Health Authority, Western Norway Regional Health Authority, National Centre for eHealth Research, Industrial Development Corporation of Norway)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Aurora, Barnekreftforeningen, Blå Kors Norge, Internasjonal helse- og sosialgruppe, Kreftforeningen, Nasjonalforeningen for folkehelsen, Mat&Atferd, Norsk Helse- og Avholdsforbund)<br>• Research Council of Norway and Innovation Norway | |

[29] See, for example Department for Business, Energy & Industrial Strategy (2021), European Cluster Collaboration Platform (2021), Ministry of Education and Research (2020) and Norwegian Institute of Public Health (2014).

[30] Potentially, Norway can improve bottom-up and top-down R&D by, for example, leveraging the Health&Care21 process.

### 6.1.8. Priority mission area 8: Accelerate the transition to a sustainable circular economy in Norway

| Key challenges that the mission aims to address[31] | |
|---|---|
| • Increasing the percentage of materials consumed each year in Norway that make it back into the economy;<br>• Improving consumer awareness of the circular economy;<br>• Reducing per-capita consumption rates;<br>• Improving overall recycling rates; and<br>• Improving circularity in key sectors, including housing, nutrition, mobility, services, consumables, healthcare and communication. | |
| **Exemplar targeted focus areas** | |
| • Develop a sustainable and substantially circular economy in Norway with progressively diminishing use of resources (X% reduction in resource use) as Norway progresses towards that target;<br>• Improve circular business models and resource efficiency; reduce the extent of and dependence on extraction (e.g. of metals, minerals, fossil fuels);<br>• Improve supply security; increase consumer awareness of the circular economy; and<br>• Create a strong repair, reuse and recycling economy and improve circularity across specific sectors (e.g. housing, nutrition, mobility, services, consumables, healthcare and communication). | |
| **Links to RCN Strategic Areas** | **Links to UN Sustainable Development Goals** |
| • Green transition (primary link)<br>• Cohesion and globalisation | • SDG 7: Affordable and Clean Energy<br>• SDG 9: Industry, Innovation and Infrastructure<br>• SDG 11: Sustainable Cities and Communities<br>• SDG 12: Responsible Consumption and Production<br>• SDG 13: Climate Action |
| **Links to clusters of Horizon Europe's Global Challenges Pillar II** | **Links to EU mission areas identified in Horizon Europe** |
| • Climate, Energy and Mobility<br>• Food, Bioeconomy, Natural Resources, Agriculture and Environment | • A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030 |
| **Intersection with other indicative priority mission(s) identified in this study** | |
| • Protect, value and restore Norwegian biodiversity and reduce its degradation and loss<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce<br>• Actively enable digital transformation at all levels of government in Norway<br>• Play a leading role in Norway and internationally to substantially increase the use of renewable energy in a sustainable and long-lasting manner and accelerate R&I in this area | |
| **Involvement of key stakeholders** | |
| • Sectors (e.g. energy, transport, development, hospitality, housing, health, communication, construction, urban, forestry)<br>• Norwegian higher education institutions and research organisations<br>• International organisations (e.g. United Nations Environment Programme, OECD, European Commission, World Wildlife Fund, Food and Agriculture Organization of the United Nations, International Union for Conservation of Nature, World Nature Organization, Intergovernmental Panel on Climate Change, Global Environment Facility, Earth Systems Governance Project, Industrial Development Corporation of Norway)<br>• National government agencies (Norwegian Environment Agency, Norwegian Ministry of Climate, Climate and Pollution Agency, Norwegian Ministry of Finance, the Norwegian tax authorities)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Miljøagentene, Norges Naturvernforbund, Norsk Friluftsliv, Natur og Ungdom)<br>• Research Council of Norway and Innovation Norway | |

[31] See, for example Circle Economy and Circular Norway (2020).

### 6.1.9. Priority mission area 9: Play a leading role in tackling antimicrobial resistance (in Norway and globally) and actively share expertise

| Key challenges that the mission aims to address | |
|---|---|
| • Reducing the number of healthy people colonised with resistant bacteria and the number of patients who have infections caused by these bacteria in Norway and globally;<br>• Preventing infections and limiting antibiotic consumption;<br>• Reducing the use of antibiotics in animals in Norway and globally;<br>• Increasing surveillance for safe delivery of medical treatment in the future;<br>• Addressing the challenge of stalled antibiotics development internationally;<br>• Increasing knowledge about what causes the development and spread of antibiotic resistance; and<br>• Contributing to Norway's existing role a driving force in international and normative work to strengthen access, responsible use and development of new antibiotics, vaccines and better diagnostic tools. | |
| Exemplar targeted focus areas | |
| • Put in place systems to improve the effective diagnosis and surveillance of antibiotic-resistant infections and antibiotic use in Norway and internationally;<br>• Contribute to further reducing the demand for (new) antibiotics;<br>• Provide thought leadership to help improve awareness and understanding of antimicrobial resistance;<br>• Actively share experiences, approaches and expertise in combating antimicrobial resistance internationally; and<br>• Actively invest in developing alternatives to current antibiotics. | |
| Links to RCN Strategic Areas | Links to UN SDGs |
| • Health and welfare (primary link)<br>• Cohesion and globalisation | • SDG 3: Good Health and Well-being<br>• SDG 14: Life Below Water<br>• SDG 15: Life on Land |
| Links to clusters of Horizon Europe's Global Challenges pillar | Links to EU mission areas identified in Horizon Europe |
| • Health<br>• Food, Bioeconomy, Natural Resources, Agriculture and Environment | • A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030<br>• Mission Starfish 2030: Restore our Ocean and Waters<br>• Caring for Soil Is Caring for Life |
| Intersection with other priority mission(s) identified in this study | |
| • Protect, value and restore Norwegian biodiversity and reduce its degradation and loss<br>• Actively contribute to healthy, safe and sustainable food systems<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce<br>• Actively enable digital transformation at all levels of government in Norway | |
| Involvement of key stakeholders | |
| • Sectors (e.g. health, farming, husbandry, care, hospitality, environment, food, agriculture)<br>• Higher education institutions and research organisations<br>• Norwegian national agencies (National Institute of Public Health, Ministry of Health and Care Services, Ministry of Trade, Industry and Fisheries, Ministry of Agriculture and Food, Norwegian Food Safety Authority)<br>• International organisations (European Commission, European Centre for Disease Prevention and Control, Food and Agricultural Organization of the United Nations, World Organisation for Animal Health, World Health Organization, Industrial Development Corporation of Norway)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Miljøagentene, Norges Naturvernforbund, Norsk Friluftsliv, Natur og Ungdom)<br>• Research Council of Norway and Innovation Norway | |

### 6.1.10. Priority mission area 10: Establish a resilient and sustainable blue economy in Norway

| Key challenges that the mission aims to address | |
|---|---|
| • Helping reduce the negative anthropogenic impacts on the ocean ecosystem;<br>• Improving the sustainable management of ocean ecosystems (including coastal areas);<br>• Developing and sustaining competitive ocean-based industries in Norway (e.g. seafood);<br>• Developing Norway's participation in the United Nations Decade of Ocean Science for Sustainable Development;<br>• Developing impactful technologies and innovations (e.g. for green shipping);<br>• Developing and scaling up sustainable solutions for the blue economy; and<br>• Improving Norway's position as a global leader in relation to the ocean ecosystem. | |
| Exemplar targeted focus areas[32] | |
| • Increase the sustainable use of ocean-based resources to achieve economic growth in Norway;<br>• Preserve (and improve) the health of the coastal and marine environment around Norway;<br>• Actively invest in ocean mapping and ocean management programmes;<br>• Strengthen Norway's (international) position and expertise with regard to ocean ecosystems (including ocean governance);<br>• Put Norway at the forefront of R&I activities associated with key sectors of strength (such as aquaculture, fisheries, petroleum and shipping);<br>• Minimise the impacts of ocean acidification;<br>• Examine and invest in opportunities for offshore renewable energy to enable coastal and maritime markets in the long term;<br>• Actively support efforts to promote oceans as a sustainable and safe source of food; and<br>• Ensure the inclusion and active participation of all societal groups. | |
| Links to RCN Strategic Areas | Links to UN SDGs |
| • Oceans (primary link)<br>• Green transition<br>• Cohesion and globalisation | • SDG 14: Life Below Water |
| Links to clusters of Horizon Europe's Global Challenges pillar | Links to EU mission areas identified in Horizon Europe |
| • Climate, Energy and Mobility<br>• Food, Bioeconomy, Natural Resources, Agriculture and Environment | • Mission Starfish 2030: Restore our Ocean and Waters by 2030 |
| Intersection with other priority mission(s) identified in this study | |
| • Position Norway as a global knowledge leader in combating marine pollution and establish Norwegian ocean ecosystems free of marine pollution<br>• Enhance Norway's world-leading capabilities and expertise in future maritime technologies<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce<br>• Actively enable digital transformation at all levels of government in Norway | |
| Involvement of key stakeholders | |
| • Sectors (e.g. energy, aquaculture, development, shipping, petroleum, seafood, technology, chemical, biotech)<br>• Norwegian higher education institutions and research organisations<br>• Norwegian national agencies (e.g. Ministry of Trade, Industry and Fisheries, Ministry of Transport, Ministry of Petroleum and Energy, Norwegian Petroleum Directorate, Ministry of Local Government and Modernisation, Ministry of Foreign Affairs, Industrial Development Corporation of Norway)<br>• International organisations (e.g. United Nations Environment Programme, International Water Association, Food and Agricultural Organisation of the United Nations, European Commission)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Miljøagentene, Norges Naturvernforbund, Norsk Friluftsliv, Natur og Ungdom, Strømmestifelsen)<br>• Research Council of Norway and Innovation Norway | |

[32] For example, improve bottom-up and top-down R&D processes with a variety of different stakeholders to ensure the sustainable use of ocean resources (e.g. leveraging the Ocean21 process).

### 6.1.11. Priority mission area 11: Position Norway as a global leader in combating marine pollution and establish Norwegian ocean ecosystems free of marine pollution

| Key challenges that the mission aims to address | |
|---|---|
| • Clearing ocean environments (including coastal areas) of waste;<br>• Ensuring improved and sustainable management of (plastic) waste;<br>• Conserving marine resources and environments and improving their protection;<br>• Supporting communities that are dependent on the marine ecosystem; and<br>• Improving Norway's position as a global leader in relation to the ocean ecosystem. | |
| **Exemplar targeted focus areas** | |
| • Leverage Norway's world-leading ocean management capabilities and expertise to substantially reduce the amount of marine pollution and hazardous substances (including plastics) entering the ocean environment around Norway (including those arising from land-based activities);<br>• Remove/clean up marine pollutants (including plastics) that are already present in the ocean;<br>• Spearhead international efforts in reducing global marine pollution; and<br>• Reduce greenhouse gas emissions from marine activities, such as domestic shipping and fisheries. | |
| **Links to RCN Strategic Areas** | **Links to UN SDGs** |
| • Oceans (primary link)<br>• Green transition<br>• Cohesion and globalisation | • SDG 13: Climate Action<br>• SDG 14: Life Below Water |
| **Links to clusters of Horizon Europe's Global Challenges pillar** | **Links to EU mission areas identified in Horizon Europe** |
| • Climate, Energy and Mobility<br>• Food, Bioeconomy, Natural Resources, Agriculture and Environment | • Mission Starfish 2030: Restore our Ocean and Waters by 2030 |
| **Intersection with other priority mission(s) identified in this study** | |
| • Establish a resilient and sustainable blue economy in Norway<br>• Enhance Norway's world-leading capabilities and expertise in future maritime technologies<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce<br>• Actively enable digital transformation at all levels of government in Norway | |
| **Involvement of key stakeholders** | |
| • Sectors (e.g. technology, waste, shipping, energy, chemical industry, biotech)<br>• Norwegian higher education institutions and research organisations<br>• Norwegian national agencies (e.g. Ministry of Trade, Industry and Fisheries, Ministry of Transport, Ministry of Petroleum and Energy, Norwegian Petroleum Directorate, Ministry of Local Government and Modernisation, Ministry of Foreign Affairs, Industrial Development Corporation of Norway)<br>• International organisations (e.g. United Nations Environmental Assembly, International Water Association, Food and Agricultural Organization of the United Nations, World Bank, United Nations Development Programme, European Commission)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Miljøagentene, Norges Naturvernforbund, Norsk Friluftsliv, Natur og Ungdom)<br>• Research Council of Norway and Innovation Norway | |

### 6.1.12. Priority mission area 12: Protect, value and restore Norwegian biodiversity and reduce its degradation and loss

| Key challenges that the mission aims to address | |
|---|---|
| • Improving integration between key sectors, i.e. biodiversity and farming;<br>• Sustainably managing nature and ecosystem services to improve well-being;<br>• Improving resilience to climate change;<br>• Improving ecosystem services;<br>• Growing the green economy; and<br>• Integrating biodiversity values into national and international planning and activities. | |
| **Exemplar targeted focus areas** | |
| • Significantly reduce (X% reduction in) and ultimately halt biodiversity loss in Norway's natural environment and farther afield that might result from Norwegian activities;<br>• Actively engage in activities and play a leading role in actions and decision making that help sustainably use, conserve and appropriately restore well-functioning, diverse and healthy natural land and water ecosystems (e.g. through environmental conservation and ecological restoration activities, such as rewilding);<br>• Promote growth of the green economy; and<br>• Promote the importance of and integrate biodiversity values into national and international planning and activities. | |
| **Links to RCN Strategic Areas** | **Links to UN SDGs** |
| • Green transition (primary link)<br>• Cohesion and globalisation<br>• Oceans | • SDG 13: Climate Action<br>• SDG 14: Life Below Water<br>• SDG 15: Life on land |
| **Links to clusters of Horizon Europe's Global Challenges pillar** | **Links to EU mission areas identified in Horizon Europe** |
| • Food, Bioeconomy, Natural Resources, Agriculture and Environment | • A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030<br>• Mission Starfish 2030: Restore our Ocean and Waters by 2030<br>• Caring for Soil Is Caring for Life |
| **Intersection with other priority mission(s) identified in this study** | |
| • Establish a resilient and sustainable blue economy in Norway<br>• Establish Norway as a knowledge leader in global change processes, development and international relations<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce<br>• Actively enable digital transformation at all levels of government in Norway | |
| **Involvement of key stakeholders** | |
| • Sectors (e.g. agriculture, biotechnology, environment, industry, public sector, energy)<br>• Norwegian higher education institutions and research organisations<br>• Norwegian national agencies (Ministry of Trade, Industry and Fisheries, Ministry of Transport, Ministry of Petroleum and Energy, Norwegian Petroleum Directorate, Ministry of Local Government and Modernisation, Ministry of Foreign Affairs, Industrial Development Corporation of Norway)<br>• International organisations (World Wildlife Fund, Conservation International, Fauna & Flora International, United Nations Environment Programme, Food and Agricultural Organization of the United Nations, Wildlife Conservation Society, European Commission)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Miljøagentene, Norges Naturvernforbund, Norsk Friluftsliv, Natur og Ungdom)<br>• Research Council of Norway and Innovation Norway | |

### 6.1.13. Priority mission area 13: Play a leading role in Norway and internationally to substantially increase the use of renewable energy in a sustainable and long-lasting manner and accelerate R&I in this area

| Key challenges that the mission aims to address | |
|---|---|
| • Increasing the percentage of electricity production that comes from renewable energy sources;<br>• Making all new passenger cars and light vans zero-emissions vehicles and make buses and lorries emissions free;<br>• Improving reuse, recycle and repurpose strategies across different sectors;<br>• Improving and creating a fluctuating renewable energy supply;<br>• Increasing investment in (for example) solar panels, hydropower and wind parks;<br>• Improving tenant electricity models, car sharing, bicycle schemes and home storage systems; and<br>• Improving the smart grid and solutions for flexibility and integration of different power systems where renewables can dominate | |
| **Exemplar targeted focus areas** | |
| • Improve energy security by substituting fossil fuels with renewable sources across all sectors;<br>• Improve access to modern, reliable and cost-effective clean energy sources across all segments of the population; substantially improve energy efficiency (e.g. in the built environment);<br>• Accelerate R&I and increase public and private sector investment in renewable energy infrastructure and technology;<br>• Mobilise knowledge exchange and cross-sectoral/international collaboration (e.g. to share lessons, reduce duplication); and<br>• Provide thought leadership to help improve awareness and understanding. | |
| **Links to RCN Strategic Areas** | **Links to UN SDGs** |
| • Green transition (primary link)<br>• Cohesion and globalisation<br>• Technology and digitalisation | • SDG 7: Affordable and Clean Energy<br>• SDG 9: Industry, Innovation and Infrastructure<br>• SDG 13: Climate action |
| **Links to clusters of Horizon Europe's Global Challenges pillar** | **Links to EU mission areas identified in Horizon Europe** |
| • Climate, Energy and Mobility | • A Climate Resilient Europe – Prepare Europe for Climate Disruptions and Accelerate the Transformation to a Climate Resilient and Just Europe by 2030<br>• 100 Climate-Neutral Cities by 2030 – By and for the Citizens |
| **Intersection with other priority mission(s) identified in this study** | |
| • Establish a resilient and sustainable blue economy in Norway<br>• Significantly reduce Norway's transport-related emissions<br>• Establish Norway as a knowledge leader in global change processes, development and international relations<br>• Contribute to Norway's digital transformation by creating a diverse, digitally and soft-skilled workforce | |
| **Involvement of key stakeholders** | |
| • Sectors (e.g. energy, transport, development, technology, ocean, business, building, hospitality, retail)<br>• Norwegian higher education institutions and research organisations<br>• Norwegian national agencies (e.g. Ministry of Trade, Industry and Fisheries, Ministry of Transport, Ministry of Petroleum and Energy, Ministry of Local Government and Modernisation, Waste Norway, Bane Nor, Industrial Development Corporation of Norway)<br>• International organisations (e.g. United Nations Environment Programme, International Water Association, United Nations Development Programme, European Commission)<br>• Voluntary organisations (e.g. Frivillighet Norge, European Network of National Civil Society Associations, Miljøagentene, Norges Naturvernforbund, Norsk Friluftsliv, Natur og Ungdom)<br>• The Research Council of Norway and Innovation Norway | |

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# Annex A. Future scenario narratives used in the study

In this annex, we present the comprehensive versions of the future scenario narratives across both scenario sets (i.e. Norway in a national context and Norway in a global context). The scenarios were used in the foresight workshops as a tool to examine and debate a set of potential priority missions and discuss ideas for wider structural measures. The narratives were shared with the workshop participants in advance of the workshops. Because of their cross-cutting nature, the cohesion and globalisation and the technology and digitalisation strategic areas (and to some extent green transition as well), were covered by both scenario sets. To aid the reader, before presenting the detailed scenario narratives, we again outline the two broad scenario sets:

- **Scenario set 1 (*Norway in a national context*):** The first scenario set, consisting of four future scenarios, broadly focuses on Norway in a national context, largely relating to the Norwegian domestic agenda. This scenario set encompasses such themes as health, welfare, education, work and skills, cohesion, and relevant aspects of technology and digitalisation, and it also covers some aspects related to green transition (for example, in relation to the circular economy).
- **Scenario set 2 (*Norway in a global context*):** The second scenario set, consisting of four future scenarios, focuses on Norway in an international or global context, primarily relating to Norway's outward-facing role. It broadly covers themes related to climate, oceans, energy, transport, food, biodiversity and globalisation, as well as relevant aspects of technology and digitalisation.

Alongside each scenario narrative, we also outline the associated key characteristics and underpinning factors of the scenarios.[33]

[33] The arrows in the scenario narratives signify as follows: An upwards-facing arrow indicates an increase in the projection/future direction of travel for the factor, a downwards-facing arrow indicates a decrease in the projection/future direction of travel for the factor, and an arrow that goes in both directions horizontally indicates that the projection/future direction of travel for the factor remains the same as the current situation.

# A.1. Future scenario narratives for the scenario set pertaining to 'Norway in a national context'

## Scenario 1: Protectionist decline

### Global developments

Shifts in geopolitical power in the 2020s led to a period of political instability over the next decade with serious implications for global trade. Struggling to maintain supply chains, countries increasingly put pressure on locally based companies to serve their needs first. Many countries have adopted a protectionist approach, increasingly looking inwards to protect their own populations. As a result, Norway has become increasingly dependent on primary exports. Even within the EU, which initially sought to maintain a united front, there are divergent views on how to tackle current problems of climate change and stagnant economic growth.

### Health and welfare in Norway

The delivery of health and welfare in Norway has also been affected by protectionism. Unable to make proper use of collaboration and imports of medical equipment from other countries, the Norwegian government has struggled to use technology and innovation to meet the complex health needs of the Norwegian population. However, there has been increased national spending on the healthcare sector in terms of research and training, as well as frontline delivery, although medical and care services have not been linked up. Approaches to complex health needs related to an overall increase in life expectancy, population ageing and immigration are largely reactive, with limited capability in preventative strategies. Protectionism presents a significant impediment to pharma and life sciences, hindering the development of industries that thrive on collaboration and sharing.

### Societal and economic development

With the slowdown in sovereign wealth fund growth and unpredictability in global markets, Norwegian business and consumer confidence is low. At the same time, the ageing population in Norway has increased spending on social services and pensions. Norway has continued to accept some migrants from countries affected by instability or the effects of climate change, from a pragmatic perspective – to not make the current international situation worse – and to meet some of its labour shortages. However, reduced cooperation with the EU means that skilled labour is generally in short supply. Despite increased growth in some sectors, such as domestic food production, overall productivity growth and labour force participation are low and trust in public institutions is declining. Stagnant economic growth has also reduced much-needed investment in a digital infrastructure that facilitates data sharing, adequately deals with cyber and privacy protection threats, and helps increase the digital skills of the Norwegian population. There is a lack of transnational cooperation of social media, and social media continues to be used extensively to influence public debate on immigrants, spread hate speech and polarise Norwegian society.

### The location of jobs and housing and greening initiatives

With limited employment opportunities in urban areas, where the effect of increasing temperatures is also more apparent, Norwegians are dispersing across smaller cities and towns. However, this dispersal is limited by a lack of investment in public transport and digital connectivity. The decrease in urbanisation has positive impacts on health outcomes of populations, with less traffic and pollution. Recent investments have also improved access to health and welfare services across different geographical locations in Norway, although research and training still tends to be city based. There have been some successes in greening domestic energy and linking up waste and energy across the public sector, but the circular economy is not seen as the way forward by politicians or citizens.

### Research and innovation

Overall, funding in the R&I sector has reduced, and it is fragmented due to general mistrust of the government and international actors. Norwegian actors are finding it difficult to compete in the world market. These issues are further amplified by the absence of coordination and collaboration across stakeholders in the R&I system in a national and international arena, as well as limited data sharing. Furthermore, the lack of relevant competencies in the labour market required for meeting current and future demands of the sector has created longer-term challenges. In Norway, the absence of infrastructure and funding to support partnerships, combined with restrictions on data access and sharing, has prevented Norway from leveraging and capitalising on the data economy and on the digitalisation trends in the health, pharma and life sciences.

| | |
|---|---|
| Health and welfare | Demand and access to health and welfare services ↔<br>Collaboration and interdisciplinarity ↓<br>Development and adoption of telemedicine and telecare ↔ |
| Economy and society | Discrimination and hate speech ↑<br>Use of social media to spread disinformation – increasingly used with impact on the spread of misinformation<br>Trust in public administration ↓<br>Net immigration ↔<br>Natural resource wealth – slow growth or stagnation in the economy |
| Location of jobs and housing and greening initiatives | Skilled labour availability to match employment demand ↓<br>Location of jobs and housing – more dispersion with mixed transport links<br>Ability of Norway to adapt to climate change ↔<br>Circular infrastructure for energy, water and waste supply – focussed on current approaches. |
| Technology, digital skils and digital threats | Digital skills – digital divide increases ↓<br>Digital security and cyber protection – Norway is unable to respond, and threats increase, demanding increasing protection<br>Data sharing<br>Technology convergence and use of enabling technologies ↓ |
| Research and innovation | Globalisation of research and innovation and data sharing – decrease in international data sharing and collaboration<br>Funding for research and innovation – decreases |

# Scenario 2: Going green together

## Global developments

During the 2020s there was a realisation across governments, industry leaders and populations that the relationship with the planet is key and resources and time are finite. This led to efforts at the international level and activism at the local level to build a green agenda. Norway, already a leader in renewable energy and decarbonised transport, has focused on further reducing its environmental and climate impact.

## Health and welfare in Norway

Norway has undergone significant demographic changes, with a shift towards a higher number of senior citizens. This has created pressure for the healthcare system due to increased demand for services. On the other hand, there is increased access to health and welfare services as a result of policies promoting decentralisation towards municipalities and increasing digitalisation of the healthcare sector. Telehealth has become the default option, allowing for a more targeted and less resource-intensive provision of services, reducing unnecessary travel. Access to healthcare has also improved through strategies focused on reducing and preventing social inequalities in health, such as prevalence of risk factors in population sectors with lower income and education. Alongside these changes, there has been an increase in digital skills across the Norwegian population due to efforts from the government to build digital competence by adapting the education curricula and providing adequate training across all age groups and sectors. These educational programmes have also sought to develop other relevant employment skills as the economy continues to move from a consumption to a green approach.

## Societal and economic development

Norway has seen a decline in hate speech and discrimination, partly as a result of interventions, such as the increased capacity of authority to tackle these issues, especially in the online environment. Internet and smartphone use remain high in Norway. With the higher level of digital competence across all demographics and improved data security and ethics standards, social media is generally seen as a reliable source, used to facilitate a range of peer-to-peer activities and communications, from grassroots to government. Pockets of misinformation remain, however, and attract a vocal minority. Data security standards have also created tensions given the overregulation perceived by the Norwegian population.

## The location of jobs and housing and greening initiatives

The success of Norway's approach is reflected in the level of trust in Norway's public administration, which continues to grow. This has been important in fostering green transition initiatives through the interconnection between citizens, local governments and local businesses. Cross-sectoral cooperation and cooperation across different governance levels have promoted a circular economy at national, regional and local levels. The Government Pension Fund of Norway has managed to adequately manage climate risks by investing in climate change policy and new technology. This is particularly the case within regions with higher population density, such as cities, where the adaptation of the built environment has been an important priority for the green transition, and green initiatives, such as urban farming and 'green builds' that are fully carbon neutral, have become more widespread. Additionally, citizens have a more prominent role in the green transition through higher levels of engagement in innovation and green entrepreneurship, as well as through local activism. There are, however, challenges in fostering behavioural change; older generations show more reluctance to adapting to new social norms, while younger generations feel they are being asked to pay too much of the price for climate change.

## Research and innovation

Open science and increased data sharing have made research more accessible to citizens and policy makers, which has been particularly beneficial in supporting evidence-based policy for the green transition. Increased data availability has also allowed researchers to better evaluate the effectiveness and acceptability of initiatives, and to determine how Norway can best leverage and adapt to these. Aligned with the focus on cybersecurity in the EU Framework Programme, Norway has made a key priority to embed data protection and information security in its information and communications technology policy strategy, which has allowed for a better response to digital and cyber security threats, which have now decreased. Additionally, the green transition has led to a redistribution of jobs, away from jobs in a fossil-fuelled industry towards jobs in a green economy.


| | | |
|---|---|---|
| Health and welfare | Demand and access to health and welfare services | ↑ |
| | Collaboration and interdisciplinarity | ↑ |
| | Development and adoption of telemedicine and telecare | ↑ |
| Economy and society | Discrimination and hate speech | ↓ |
| | Use of social media to spread disinformation – increasingly used, but little impact on the spread of disinformation | |
| | Trust in public administration | ↑ |
| | Net immigration | ↓ |
| | Natural resource wealth – steady growth in the economy, greater share of wealth from sustainable sources | |
| Location of jobs and housing and greening initiatives | Skilled labour availability to match employment demand | ↑ |
| | Location of jobs and housing – located in big cities and transport-friendly locations | |
| | Ability of Norway to adapt to climate change | ↑ |
| | Circular infrastructure for energy, water and waste supply – develop rapidly and are implemented at national, regional and local levels | |
| Technology, digital skills and digital threats | Digital skills – decrease, digital divide increases | |
| | Digital security and cyber protection – Norway is better able to respond, decreasing threats | |
| | Data sharing | ↑ |
| | Technology convergence and use of enabling technologies | ↑ |
| Research and innovation | Globalisation of research and innovation and data sharing – increasing international data sharing and collaboration (open and distributed) | |
| | Funding for research and innovation – sufficient and continuous | |

# Scenario 3: Slowly changing society

## Global developments

The mid- to late 2020s saw a return to business as usual for most of the world and Norway. Strategic alliances have largely remained the same, and there is a slow but steady drift of economic power and influence away from Western powers. Although there have been periods of strong support for environmental activism, particularly in Europe, this has not been sustained, and internationally there has not been a real impetus for change. There has been some progress towards reducing emissions, but without a clear vision at the international level, this progress has not been sufficient, and the impacts of climate warming are starting to be felt.

## Health and welfare in Norway

Trends towards technological innovation and digitalisation in the healthcare system in Norway have continued, and there are areas of Norway where there is strong technological innovation. However, these are not widely rolled out across different regions in Norway, and there are challenges with collaboration between the private and public sectors. Some private initiatives exist in the healthcare sector, but the Norwegian system continues to rely heavily on public funds, and measures to improve care coordination have been only partly successful. The healthcare workforce has been only partly able to meet the growing health and long-term care needs that have resulted from Norway's ageing population, increased immigration, and the effects of climate change. There is also a reluctance to address the underlying issues of social inequalities in life expectancy, disparities among income groups, and behavioural risk factors.

## Societal and economic development

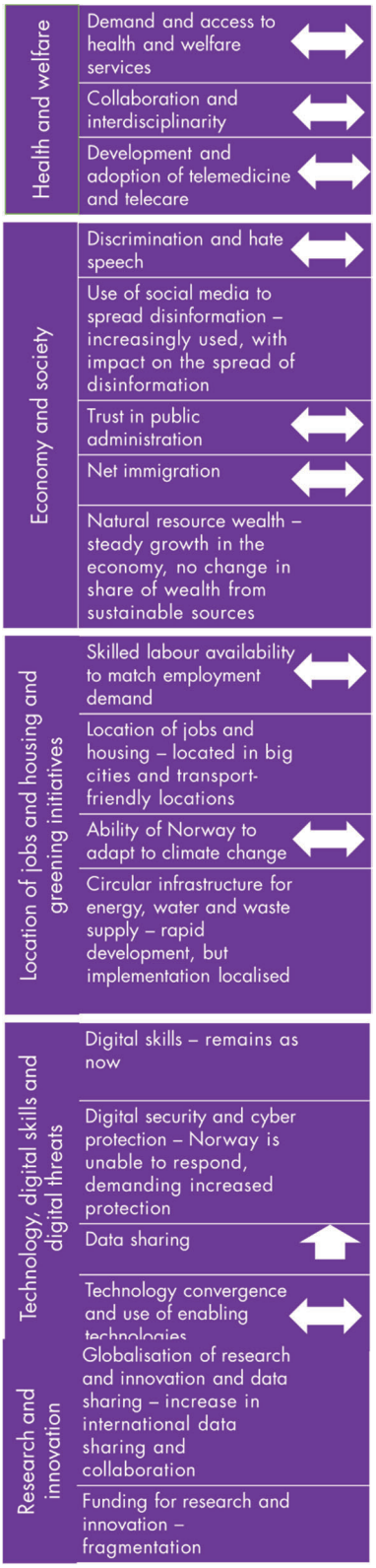
Regional conflicts and climate change have created increased pressure on immigration globally, but Norway has always had strong measures in place to ensure education and employment for migrants. Despite this, tensions still exist, particularly with regard to cultural integration. With only incremental changes in the make-up of the Norwegian welfare provision and labour markets, trust in public institutions remains relatively high, but there is concern about Norway's strategy for ensuring it has the necessary digital and employment skills to deal with changes in the national and global landscape. Although there is good digital provision in Norway, lack of appropriate regulation of the digital space means that social media continues to be a source of misinformation, feeding potential social divisions.

## The location of jobs and housing and greening initiatives

There has been an increasing concentration of the Norwegian population in urban areas, as a thicker labour market in the cities has been better able to meet the demand of workers with specific qualifications. At the same time, commercial activity has opened up in the Arctic following the lack of impetus to deal with climate change internationally, which has accelerated the melting of the sea ice in the Arctic. This has accelerated economic growth in counties in northern Norway, but challenges persist with ensuring that there is access to labour with the necessary skills and expertise to make use of an improved knowledge base and value creation in the North. Regional development initiatives also remain weakly connected and do not really support the Sami community and their employment and business opportunities. Because Norwegians are concentrated in cities, it has been easy to join together energy and waste initiatives across hospitals and public sector buildings. This has also facilitated the creation of city-led initiatives, but their wider take-up has not been incentivised. Many Norwegians feel that they are already playing their part with renewable energy and electric vehicle use. Although people have greater access to services in urban areas, the concentration of people in cities also means that there are increased pressures of mass marketing, availability of unhealthy food choices and access to transport, which all have an effect on lifestyles and negative health outcomes.

## Research and innovation

National and international collaboration for R&I continues to increase, but researchers continue to voice concerns about data sharing, and funding for interdisciplinary research is limited. The lack of collaboration between industry and the higher education sectors also poses key challenges for Norway. The skills that Norwegians obtain through higher education are not fully aligned with the skills needed in the labour market, particularly as new areas of innovation open up and automation, the application of artificial intelligence and broader technology convergence start to change the nature of employment. There is a fragmented funding landscape that is largely focused on excellent science, while the translation into innovation outputs is limited. In health, Norway concentrates health R&D in university research, and there is weak coordination between the different key actors in the R&D health system, which has had resulted in a lack of cost-effectiveness in the development of pharmaceuticals in Norway.



# Scenario 4: Technological trajectory

## Global developments

In line with the prevailing international view, Norway has focused on technological advances to promote economic growth and support its sustainability goals. Technology and the knowledge-based economy have been the main tenets of the Norwegian R&I agenda, from both an international and a domestic perspective, with new technologies and their convergence having brought about significant advances in health and welfare. However, changes in employment have created new social inequalities.

## Health and welfare in Norway

Many digital solutions have been integrated into health and welfare services, which has helped to address the continued demand and pressure for these services. Automation and artificial intelligence are commonplace in healthcare, and telehealth has become the default option for health and welfare. Digital technology, such as robotics, is used to help support the autonomy of older people. Thanks to its comprehensive health databases and its ability to exploit large amounts of patient data, Norway was able to rapidly digitalise the health sector. In addition, health data; an improved focus on funding; and developments in and convergence of bioinformatics, genetic engineering, biotechnology and nanotechnology have enabled Norway to move towards personalised medicine, which has made great strides since the 2020s. Overall, this has led to a more patient-centred health system. However, there are concerns that the health system is becoming 'twin-track', because users have to be digitally competent and willing to share personal data to access it and because some advanced treatments are only available privately.

## Societal and economic developments

Although a substantial part of the Norwegian population now has access to Internet and service industries, such as banking, finance and tourism, have achieved efficiency gains and improved their business processes, some people are being left behind in terms of their digital skills even though the economy is doing well. Technology convergence and development has been led by Norwegian industry, and central and local government and other public sectors have not fully integrated common systems for user-friendly digital services. There is acceptance from the public that data generally has to be shared to access services and participate in society, and the Norwegian population continues to have a relatively stable level of trust in its public institutions. However, trust in government has, at the same time, not increased, and the perceived lack of control around data privacy and security issues threatens to reduce it further. The application of advanced technologies has contributed to efficiencies in transport, health, agriculture and food, and manufacturing industries, at the same time transforming employment in these industries. Norway has actively addressed these changing employment needs through education and training policies. Although overall immigration to Norway has remained stable, there has been a shift in the type of immigrant, to higher-skilled, wealthier immigrants. However, the need for some low-skilled labour remains, and political tensions around the role of immigrants in the Norwegian economy and society persist.

## The location of jobs and housing and greening initiatives

Remote working has been the norm since the 2020s. Investment in digital infrastructure has continued, and many Norwegians have moved out of urban centres to smaller cities and towns, where the impacts of climate change are currently more supportable. The Internet and social media are key elements of this lifestyle, with vast amounts of data changing hands and control of platforms still in the hands of Big Tech companies that actively resist regulation. Norway is not alone in struggling to police misinformation, and it has invested heavily with partners in cyber security prevention.

## Research and innovation

The increased use of artificial intelligence, big data and genomics in Norwegian society has been associated with a steadily rising demand for data and data sharing both nationally and internationally. Norway has been able to widely deploy technologies across sectors due to increasing collaboration and funding for collaboration across sectors. However, R&I initiatives for developments in technology tend to be geared towards developments in the natural sciences. There is a lack of recognition of the human, ethical and legal challenges that emerge with increased data sharing and resulting privacy and cyber security threats, which contributes to a growing distrust of pervasive technology in Norway.

**Health and welfare**

- Demand and access to health and welfare services
- Collaboration and interdisciplinarity
- Development and adoption of telemedicine and telecare

**Economy and society**

- Discrimination and hate speech
- Use of social media to spread disinformation – increasingly used, with impact on the spread of disinformation
- Trust in public administration
- Net immigration
- Natural resource wealth – steady growth in the economy, no change in share of wealth from sustainable sources

**Location of jobs and housing and greening initiatives**

- Skilled labour availability to match employment demand
- Location of jobs and housing – more disperse with mixed transport links
- Ability of Norway to adapt to climate change
- Circular infrastructure for energy, water and waste supply – rapid development, but implementation localised

**Technology, digital skills and digital threats**

- Digital divide increases
- Digital security and cyber protection – Norway is better able to respond, decreasing digital and cyber security threats
- Data sharing
- Technology convergence and use of enabling technologies

**Research and innovation**

- Globalisation of research and innovation and data sharing – increase in international data sharing and collaboration
- Funding for research and innovation – sufficient and continuous

# A.2. Future scenario narratives for the scenario set pertaining to 'Norway in a global context'

## Scenario 1: Protectionist decline

### Global landscape

Shifts in geopolitical power that came to the fore in the 2020s led to a period of political instability over the next decade, with serious implications for global trade. Struggling to maintain supply chains, countries increasingly put pressure on locally based companies to serve their needs first. By 2040, this has led to mistrust even among former close allies. Many countries have adopted a protectionist approach, increasingly looking inwards to protect their own populations. Even within the EU, which initially sought to maintain a united front, member states have divergent views on how to tackle current problems of climate change and stagnant economic growth. At the international level, cooperation on climate goals has plummeted and targets agreed at the last United Nations Climate Change Conference, five years ago, look increasingly unattainable. The negative impacts of climate change have been limited only by the poorly performing global economy.

### Trade and availability of skilled labour

The uncertainty in global trade has seen countries re-shore food production and manufacturing. In Norway, as elsewhere, there has been investment in automation and additive manufacturing to support this move. Although there has been an increase in immigration from countries affected by instability or climate effects, reduced cooperation with the EU means that skilled labour is in short supply. Norway remains a trusted partner for energy, but export demand for the industry has fallen, and some countries have chosen to invest in home-grown renewable energy to secure their supply. Demand for Norwegian seafood products and shipping in global markets is also down, and Norway's imports of manufactured items have also declined.

### Circular initiatives

Despite Norway's success in greening its domestic energy and transport sectors, successive governments have found it increasingly difficult to encourage further behavioural change through circular economy initiatives when consumption is down and many in the population are worrying about how to pay their bills. Stagnant economic growth has meant that much-needed investment in digital infrastructure has also stalled. Compounding this, the levels of public trust in science and technology are at an all-time low, and a few high-profile cyber-attacks have dominated the headlines.

### Research and innovation

Research and innovation in Norway has been affected by reduced funding and the loss of some external collaborators, as mistrust also pervades this sector; long-term investment in research loses out to short-term policy needs as both governments and industry tighten their belts. Most funding now comes from national bodies and aims at least to facilitate collaboration between public and private sectors domestically. Opportunities are seen to develop the ocean and onshore environments for food and energy production. There is also an ambition to develop new applications using skills and innovations from the petroleum sector that could boost the economy.

| | |
|---|---|
| Green transition | Demand and support for circular initiatives ↓ |
| | Circular infrastructure for energy, water and waste supply – remains focussed on current approaches |
| | Investments/innovations to reduce emissions from oil ↓ |
| | Ability of Norway to adapt to climate change ↓ |
| | Food security and supply – Norway maintains security of food supply with higher share of domestic production |
| | Low-carbon business models (international) – no change in emergence |
| Oceans | Sustainable aquaculture – little expansion in the aquaculture sector |
| | Norwegian shipping industry – greening of international shipping industry remains as now |
| Globalisation and society | Norway's trade linkages with other countries ↓ |
| | Norwegian cooperation with EU/EEA ↓ |
| | Natural resource wealth – slow growth or stagnation |
| | Make up of geopolitical landscape – the geopolitical landscape becomes less stable with a shift in global power |
| | Skilled labour availability (to match employment demand) ↓ |
| | Teechnology convergence and the use of enabling technologies ↓ |
| Research and innovation | Globalisation of research and innovation and data sharing – decrease in international data sharing and collaboration |
| | Funding for research and innovation – decreases |

# Scenario 2: Global greening

## Global developments

During the 2020s, there was a further realisation across governments, industry leaders and populations that their relationship with the planet is key and resources and time are finite. This led to efforts at the international level and activism at the local level to build a green agenda. The EU sees the benefits not only of greater internal cooperation, but also of building external relations and leading by example. Relations between major powers have improved as these countries see value in pursuing a 'green economy' approach, focusing on innovative solutions for all sectors, rather than securing ownership of rapidly depleting resources. Regions like Africa and South America are now recognised for their valuable resources, but regional disparities still remain. The impacts of climate change are happening at a slower rate, but the longer-term focus is on adaptation, as the current trajectory, tracking close to a 2°C increase, looks hard to maintain.

## Circular economy

The top-down approach means that low-carbon business models have developed across many sectors where there are international trade sectors, and this is matched by a demand within Norway, in Europe, and internationally for products and services that have a low impact on the environment and climate. A circular economy approach has been central to this. Some change has been industry led, some has been driven by international agreements and legislation; Norway has worked hard within supra-national institutions to further this agenda and support regional change through overseas aid. But changing consumer attitudes has also been key, and top-down approaches are balanced against initiatives driven by communities and government at the local level, where quality of life is displacing consumption as a measure of success and there is a focus on local production and consumption. Yet tensions persist among different stakeholder groups, with some advocating a more relaxed approach to the environment given the gains made in recent years.

## Renewable energy

There has been a rapid move away from fossil fuel dependence to electricity from renewables, linked to expanding regional grids. The Government Pension Fund of Norway has managed to adequately manage climate risks by investing in climate change policy and new technology. International travel and transport of goods have not returned to levels seen in the 2010s. Norway has invested heavily in offshore renewables and is a key proponent of greener and smarter shipping – one area where hydrogen has taken off.

## Circular initiatives and technology in Norway

In Norway, circular initiatives have been introduced in relation to key sectors of energy, waste and water by the government, but there is also a supportive environment for local solutions, resulting in a boom in green entrepreneurship that enjoys easy access to European markets. Technology and data are seen as key to sustainable solutions, from food to retail, with many of these starting at a small scale, seizing supply chain opportunities offered by a move to low-carbon business models by bigger companies at the national and international level and the public sector. However, technology is seen as the means and not the end. Norway has also seen its aquaculture exports expand, although for fresh products these have focused on EU markets, and the domestic share of food production has also increased.

## Research and innovation

There has been investment in research, which is seen as key to a green future, both within the EU and in Norway. This has been accompanied by greater collaboration between these partners and internationally. To facilitate openness in research and innovation, the EU has also worked together with industry and national governments to develop protocols for data sharing, improved data security and authentication. While there has been action to re-align education and training to better match skills to the changing employment opportunities in Norway, these systems are still seen as being slow to respond. Collaborative research in social sciences has also been important to maintain momentum towards climate goals and global stability, keeping citizens educated and engaged.


| | |
|---|---|
| Green transition | Demand and support for circular initiatives ↑ |
| | Circular infrastructure for energy, water and waste supply – develop rapidly and implement at national, regional and national levels |
| | Investments/innovations to reduce emissions from oil ↑ |
| | Ability of Norway to adapt to climate change ↑ |
| | Food security and supply – Norway maintains security of food supply with higher share of domestic production |
| | Low-carbon business models (international) – rapid emergence |
| Oceans | Sustainable aquaculture – expanded aquaculture sector with expanded share of sustainable farming |
| | Norwegian shipping industry – greening of international shipping industry is extensive |
| Globalisation and society | Norway's trade linkages with other countries ↑ |
| | Norwegian cooperation with EU/EEA ↑ |
| | Natural resource wealth – steady growth, with greater share from sustainable sources |
| | Make-up of geopolitical landscape – more stable, with greater cooperation and stability in Norway's partner countries |
| | Skilled labour availability (to match employment demand) ↑ |
| | Technology convergence and the use of enabling technologies ↑ |
| Research and innovation | Globalisation of research and innovation and data sharing – increase in international data sharing and collaboration (open and distributed) |
| | Funding for research and innovation – sufficient and continuous |

# Scenario 3: Slowly shifting power

## Global developments

The mid- to late 2020s saw a return to business much as usual for most of the world. Although Britain's exit from the European Union did result in a small shift in trading patterns, strategic alliances have largely remained unchanged, and the slow but steady drift of economic power and influence away from Western powers has continued. Regional conflicts rumble on, but wider geopolitical tensions, for a while the focus of global attention, have now largely eased. The intervening years have seen the usual rounds of climate and trade summits, but existing supra-national structures are losing their relevance. Although there have been periods of strong support for environmental activism, particularly in Europe, this had not been sustained, and internationally, it has not led to impetus for real change. There has been some steady progress towards reducing carbon emissions, but, as foreseen, without a clear vision at the international level, this has not been sufficient, and the impacts of climate warming are starting to be felt.

## Economic trends

Economic trends towards increasing supply chain efficiencies through automation, artificial intelligence, and distributed ledger technologies have continued, as have efforts to decarbonise the transport and energy sectors. Electric cars are now increasingly widespread, but there is a lack of consensus on greening international shipping and aviation. Progress in other sectors, which depend on commercial incentives for citizens and businesses, is more limited. The circular economy is still seen as a key solution by the EU, but it has not gained much traction across member states, especially when other problems seem more pressing.

## Oceans

The ocean has become an important focus for the Norwegian economy. There is continued demand for sustainable gas from Norway's key partners as they transition towards net-zero, and Norway has expanded its ocean-bed carbon storage capability to decarbonise its gas exports. Other offshore technologies, such as solar panels and wave energy convertors, are being explored to supplement its hydropower and offshore wind farms. As a knowledge leader in the oceans sector, Norway has exported these solutions, often as part of its efforts to support developing countries. At the same time, Norway has seen increased demand for seafood, leading to an expansion in that sector. However, by 2040, the ability of the ocean to sustain all this activity is not clear. The impacts of climate change are particularly felt in the High North, and these changes have accelerated changes in Arctic ecosystems and the loss of sustainable habitats for Arctic species. Norway is increasingly looking to Europe and the Nordics for collaboration to solve some of these challenges. The rapid melting of the sea ice in the Arctic in recent years has reduced some of the natural ice borders between countries, creating a renewed focus on opportunities for commercial activity in the region but also tensions with other nations.

## The circular economy in Norway

Norway has opted for a government-led approach to the circular economy, mainly focusing on its energy and waste sectors as areas where these approaches could be the most beneficial. Local initiatives aimed at reducing consumption through reuse, repairing and recycling are encouraged but currently not incentivised, and many Norwegians feel that by leading on renewable energy and electric vehicle use, they are already playing their part. Green shipping is one area where Norway is leading the way again, having introduced electric batteries and carbon capture technologies into its domestic fleet.

## Research and innovation

Funding for research and development has remained fragmented both within Norway and externally. Norway has continued to co-operate closely with its EU/EEA partners. Substantial funding has been available in some areas, but the closed nature of collaboration between institutions and the lack of focus on monitoring and data sharing have meant that resources have not been targeted appropriately; there has been a lack of investment in interdisciplinary collaboration; and challenges remain with the translation of excellent science into innovations. Norwegian efforts in technology convergence have remained broad, covering energy, electronics and optics, the environment, and health. But because much research is still undertaken by the private sector and because the humanities, social science and legal perspectives on technology have not been systematically addressed, this has so far not led to the expected transformational change.

# Scenario 4: Technological trajectory

## Global developments

After some turbulence at the start of the 2020s, the focus has been on revitalising the global economy, which is seen as a key driver for reducing global inequalities and achieving inter-regional stability. As economic and geopolitical power has continued to shift towards the BRIC (Brazil, Russia, India and China) countries, Western democracies have looked to establish new regional relationships that have opened up opportunities for Norway for trade, investment and R&I collaboration. Norway has continued to play an active role in international institutions, but the prevailing international view has been that climate change goals can be achieved through digitalisation and technological advances. Consumption is still regarded as an important driver of economic growth, and the green agenda has somewhat taken a back seat. This is reflected in the current pace of environmental change, with the result that by 2040, there is a growing clamour for more action

## The use of technology

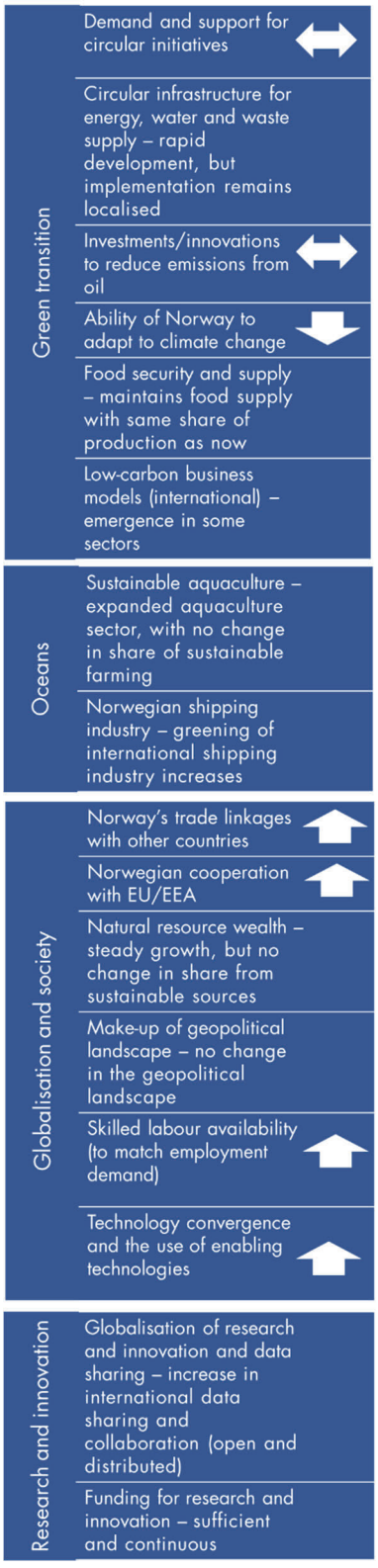
Technology has played a key in role in recent economic growth, impacting on many areas of daily life as using the Internet for entertainment, socialising shopping, working, accessing services and education has become the norm. Automation and AI are commonplace across a range of sectors, and technology convergence has led to a re-alignment in the transport, health, agriculture, food and manufacturing industries, resulting in new players and new business models. Although the perception is that power remains in the hands of a few, rapid regional expansions have created new firms. Technology has contributed to reducing carbon emissions, from large-scale carbon capture and storage and green hydrogen generation, to small-scale urban farming. Innovative technological solutions have also been implemented to both reduce and remove marine biowaste and plastics. But technology is now seen by some as a problem too in terms of resource and energy use. The past decade has also seen considerable movement of goods and people across the planet, as well as continued urbanisation. And, while changes in employment brought about by technological advances have been accommodated in some countries through forward-looking skills and education strategies, this is by no means the norm, potentially introducing new inequalities.

## The Norwegian economy

The Norwegian economy has also shown strong growth, fuelled by a continued close relationship with Europe but also by new trade links, providing technology partners and new markets for seafood products and energy solutions. Norway has invested in integrating energy and waste systems at a national level, collaborating closely with European neighbours on these and exporting this expertise. It has also continued to expand its carbon capture and storage capability, but hydrogen from sea-splitting, first trialled as part of shipping, is a potential new export. There has also been rapid growth in green initiatives in other areas that are often technology led. There is demand for sustainable solutions at the European level, but without real cross-sectoral synergies, it remains difficult for new green companies to expand outside Norway.

## Research and innovation

Technology and the knowledge-based economy have been the main tenets of the Norwegian R&I agenda both from an international and from a domestic perspective, with technology seen to underpin many sustainability objectives. To promote openness and transparency in international data sharing and collaboration, public funding from national bodies and the EU has been supplemented by the development of new relationships with universities and research institutes, including in South-east Asia and South America. This has resulted in a rapid expansion in the research base, without having to be overly dependent on a small number of foreign economies and the private sector. A key part of the agenda has also been developing a base of highly skilled workers, both through an open-door policy for overseas researchers and an agile, responsive higher education sector. But less focus has been placed on training for those who have seen their jobs displaced.



# Annex B. Set of indicative priority missions related to the RCN's five strategic areas

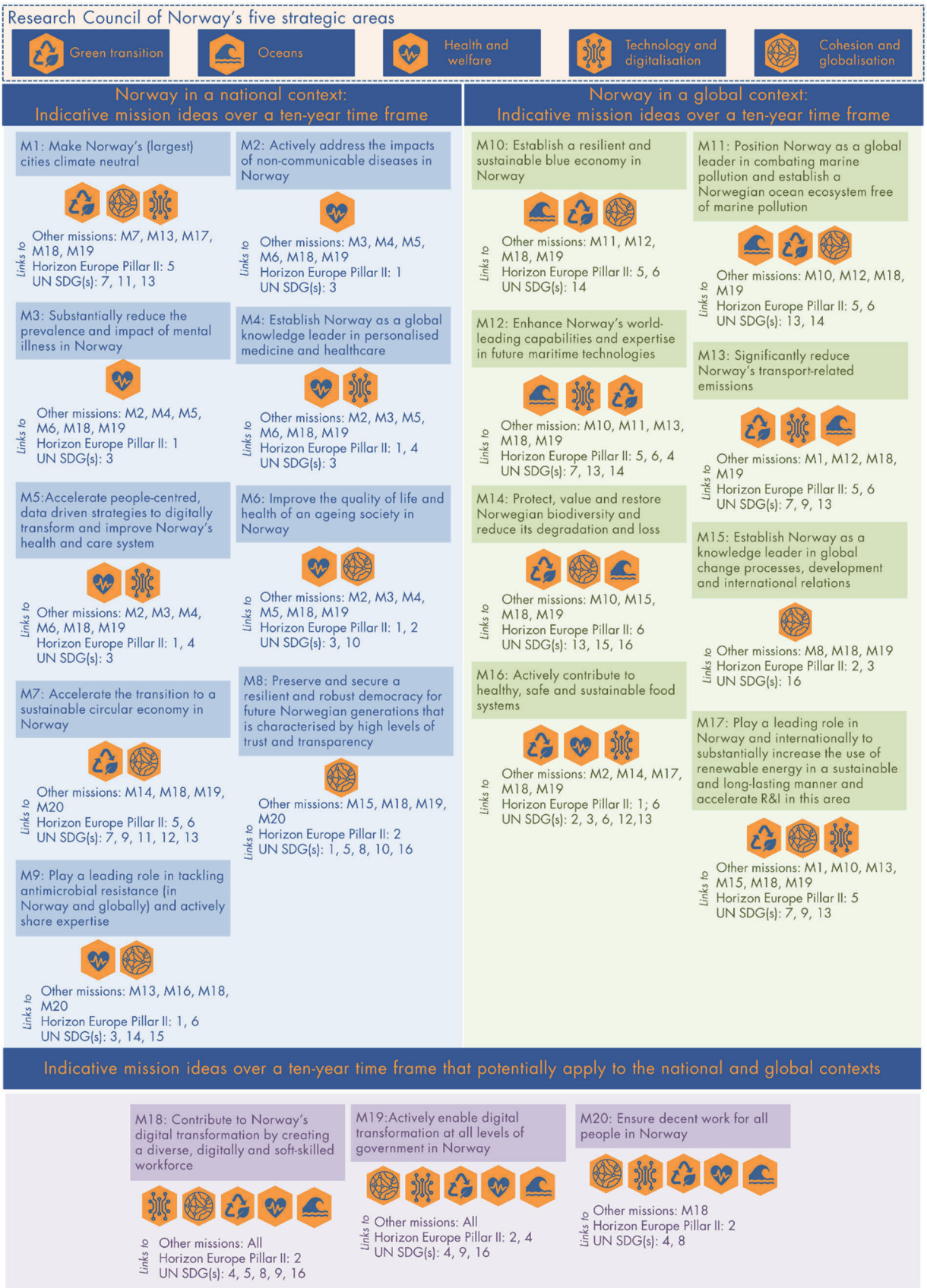
In the infographic below, we provide an overview of indicative mission ideas that have been articulated within, across and outside the RCN's five strategic areas (oceans; green transition; health and welfare; technology and digitalisation; and cohesion and globalisation).[34] The priority missions have been structured according to the two high-level scenario sets discussed in Chapter 5 and Annex A. As highlighted previously, all the missions are cross-cutting in terms of potential sectors and disciplines involved and will need a multi-stakeholder approach to be implemented. The spectrum of target focus areas for each mission will need to be specified with distinct, measurable and timebound goals that are decided by the stakeholders involved in selecting and implementing the missions. Furthermore, their implementation will also require social sciences, humanities, legal and ethical perspectives to be effectively incorporated. Finally, the missions must engage the public regularly and in a meaningful manner, and also be evaluated against a set of clearly defined criteria that are set out upfront.

[34] In the infographic, we highlight the broad links between the priority missions and the United Nations Sustainable Development Goals (UN SDGs) and the clusters under Pillar II of Horizon Europe.

The UN SDGs are: SDG1: No poverty; SDG2: Zero hunger; SDG3: Good health and well-being; SDG4: Quality education; SDG5: Gender equality; SDG6: Clean water and sanitation; SDG7: Affordable and clean energy; SDG8: Decent work and economic growth; SDG9: Industry, innovation and infrastructure; SDG10: Reduced inequalities; SDG11: Sustainable cities and communities; SDG12: Responsible consumption and production; SDG13: Climate action; SDG14: Life below water; SDG15: Life on land; SDG16: Peace, justice and strong institutions; and SDG17: Partnerships for the goals.

The Horizon Europe Clusters under Pillar II includes: (1): Health; (2): Culture, Creativity and Inclusive Society; (3): Civil Security for Society; (4): Digital, Industry and Space; (5): Climate, Energy and Mobility; and (6): Food, Bioeconomy, Natural Resources, Agriculture and Environment.

## Figure B.1 Indicative priority missions proposed within and across the five strategic areas




Source: Study team analysis