

## Executive summary

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*Norway has experienced a remarkable transformation based on research and innovation, but is now facing a “triple transition imperative”*

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In the past century, Norway has experienced a remarkable transformation which has reshaped the country into one of the richest in Europe. Norway has demonstrated its ability to seize the initiative where opportunities arise, supporting the development of successful clusters in resource-based sectors, in particular in oil and gas (O&G), shipbuilding, fisheries and aquaculture. The revenues generated from these sectors became a driving force in the growth and technological upgrading of these sectors and helped to establish a virtuous circle for building strong, interlinked research and innovation capabilities.

However, Norway is now increasingly facing a “triple transition imperative”. The first transition relates to a shift towards a more diversified and robust economy. A strong research and innovation system will be needed to transform the economy, which is still highly dependent on O&G. The second transition involves moving towards a more competitive, effective and efficient innovation system, with sufficient incentives and checks and balances for better performance in research and innovation. The higher education sector lags behind those of the other Nordic countries in a number of key research performance indicators, despite a high level of public expenditure. Finally, these structural transformations must be achieved while supporting research and innovation that can confront an array of societal challenges.

Reflecting the need for this triple transition, in 2014 the Norwegian government launched a comprehensive strategic plan to enhance the contribution of the research and higher education system to these challenges. The Long-Term Plan for Research and Higher Education 2015-2024 is built around three overarching government objectives for science, technology and innovation policy: developing research communities of outstanding quality; enhancing competitiveness and innovation; and tackling major societal challenges. This Review is intended to help inform the revision of the Long-Term Plan in 2018.

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### *Developing excellent academic communities*

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Norway has long faced concerns over the insufficient excellence of research and the quality of higher education. Although it ranks among the countries with the highest scientific performance, it falls below the top-performing countries and lacks world-class research groups. However, the fragmentation and lack of critical mass in the dominant higher education institutions, both within the organisations and in the overall higher education sector, impede the emergence of more “peaks of excellence”. The significant effort expended by Norway on mergers between universities has not yet borne fruit. Moreover, these structural changes have jeopardised the dual university system involving universities and university colleges. The institutional performance agreements currently

being tested in some universities will be instrumental not only in driving universities towards better performance, but also in preserving the distinct profiles of the different types of institutions. Norwegian public authorities should also pursue their effort to create a culture of competition and adequate competitive mechanisms among higher education institutions, including through changes to the performance-based budgeting system used to allocate its generous block grants.

Finally, the universities themselves, which have reached a significant level of autonomy, have an important role to play in enhancing research quality. The recruitment, career management, priority-setting and budget allocation processes only imperfectly allow selection mechanisms to operate at the level of departments, research groups and individual researchers. Most universities have yet to transform new opportunities – notably the implementation of the tenure-track system – into action. They will also need to use part of their internal block funding in order to strategically create critical mass and attract top talent to their best departments.

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### *Enhancing competitiveness and innovation*

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Norway's innovation performance is mixed. While this is partly attributable to the structure of the Norwegian economy, Norway can build upon the success of large Norwegian industrial clusters, interlinked with strong scientific communities in related fields. The Norwegian industry also benefits from a well-developed system of R&D support, although it seems better suited to support existing strengths than new sectors and new areas for diversification. More efforts towards greater selectivity and co-ordination of innovation policy will help in this respect. The Long-Term Plan has set ambitious goals in terms of improving Norway's competitiveness, but a more co-ordinated commitment to the priority areas will require better cross-ministry and cross-agency co-ordination.

Although still immature and fragmented, a fairly well-developed system of commercialisation has emerged as a result of several initiatives, with signs of development towards greater collaboration, critical mass and professionalisation. The third mission of universities is also increasingly acknowledged and supported in institutions. However, Norway needs a dedicated third-stream policy and funding.

The Norwegian innovation system is also characterised by a strong research institute sector, even though it is heterogeneous and fragmented. These institutions are key R&D performers in the Norwegian system in cooperation with industry and play a key role in the internationalisation of research and innovation in Norway. Research institutes are supported by the Research Council of Norway (RCN), which manages the allocation of their core funding, develops the strategy for the sector and undertakes periodic evaluation of the centres. However, the low share of base funding, the unequal roll-out of the performance-based system of the allocation of core funding across institutes has limited the RCN's capacity to steer the institutes towards specific policy goals, and in particular, to prepare for the major transition ahead.

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### *Tackling major societal challenges*

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Norway has a strong tradition of investing in research areas regarded as relevant for societal challenges and is among the European countries that have taken up the challenge to address the “grand” societal challenges with elaborate instruments at the national level. Norway's efforts to tackle societal challenges is focused on the development of the basic knowledge base underpinning societal challenges, with too little attention on the

framework conditions for innovation and systemic change, at the detriment of other areas, for instance in social sciences, from which ground-breaking solutions to societal challenges might arise. Policies should be implemented not only at the level of individual areas, but also at the systemic level. Norway has much to gain from systematic policy experimentation and learning with a focus on disseminating, scaling up and incentivising the wider implementation of successful initiatives and approaches.

The Long-Term Plan assigns a prominent place to societal challenges. However, it stops short of proposing the systemic new policy approach and instruments that such bold ambitions call for. Moreover, the plan has so far mobilised little new funding for this purpose, and there has been little change in the origin and destination of the limited funds. The revision of the plan should focus on “translational”, systemic issues focusing on turning good research into practical solutions, as well as on acknowledging the importance of user- and demand-driven innovation.

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### *Improving the governance of the national system of innovation*

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Norway has a stable and functional, but highly sectorised, policy framework that strongly shapes science, technology and innovation policy. Where this framework, governed by the so-called “sector principle”, may have been advantageous in the past to sequester research in various fields throughout the policy spectrum, Norway’s imperative for an economic transition has increased the need for horizontal, interministerial co-ordination and a more active and integrated setting of strategic priorities. Some interministerial co-ordination processes, including in the context of the preparation and implementation of the Long-Term Plan, “soften” the practice of the sector principle.

While government actors can co-ordinate specific operational issues to ensure continuous incremental progress under the current setting, broader strategic issues are not as well covered, including long-term options with alternative paths, possible directions of which priorities to choose, or larger initiatives combining funding with regulatory issues and cross-policy approaches. The absence of a top-level referee or central priority-setting mechanism at the top government level shifts the task of co-ordination to the agency level, which puts the RCN under pressure. This model of co-ordination may also leave only limited room for policy innovation and cross-cutting activities.

The “21-Forums” could be instrumental in supporting this co-ordinated work if they are constituted as permanent advisory bodies, adopt a broader and more visionary perspective, and have the capacity to monitor the implementation of their proposed strategy in close co-operation with the public authorities. In certain key areas relevant to societal challenges, for instance, the “21-Forums” set up already provides a valuable complement to the Long-Term Plan in bringing together stakeholders to agree upon, co-ordinate and advance efforts to strengthen prioritised sectors and areas.

Although it contains only a few concrete actions and does not set “hard” priorities, the LTP is a significant first step to improve Norway’s capacity for priority setting and horizontal co-ordination in the context of highly sectorial policy that is expected to advance further in its 2018 (and subsequent) revision. Its four-year cycle offers the Ministry of Education and Research and other ministries the opportunity to add more concrete structural and programme-style policy activities to the plan from 2018 onwards, without changing the plan’s general orientation.



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