

Reforms to the UK higher education, research and innovation system

September 2016

1 Executive summary

- 1.1 The UK's outstanding research base is highly productive and a magnet for global talent and investment. Earlier this year, the Government published its Higher Education and Research White Paper and associated Bill. These set out a suite of reforms that it believes could make UK research and innovation even more effective and impactful than it is today. The Government's ambition is welcome, but robust scrutiny of the Bill during its passage through Parliament will be vital to ensure these reforms are the best that they can be, build on the strengths of the current system, and have the confidence of the research community. It will also be important to ensure coordination and collaboration with the devolved nations.
- 1.2 The most significant reform to the research landscape would be the creation of an integrated research funder, UK Research and Innovation (UKRI). This organisation would bring together the seven UK Research Councils, Innovate UK and Research England to form a single non-departmental body. Under the right leadership and strategic direction, this organisation could catalyse a more strategic, agile and interdisciplinary approach to addressing global challenges. Following the referendum result to leave the EU, it could also play a key role in helping the UK meet the challenge of securing the international outlook of its higher education and research base, and of strengthening its competitiveness through a new industrial strategy.
- 1.3 In addition to changes to the research and innovation landscape, the White Paper and Bill set out measures the Government intends taking to preserve the system's strengths. The Society welcomes the ongoing commitment to investing in excellent research wherever it is found, to protecting the Haldane Principle and the intention to enshrine the dual support system in legislation.
- 1.4 **The Society believes there are more and different actions that the Government needs to take in order to ensure that the measures laid out in the Bill are properly implemented and have the intended outcomes.** The Society's recommended actions and outstanding concerns are set out below.

2 Governance and leadership

UKRI

- 2.1 The Nurse Review of Research Councils proposed that these seven funding organisations be brought together within a new organisation 'Research UK'. It also recommended that a new governance structure be introduced to deal better with cross-cutting issues, support interdisciplinary research and ensure the most effective allocation and use of resources. The Government's proposal to include Innovate UK and Research England in UKRI goes further than the Nurse Review recommendations, although Nurse did suggest that there could be benefits in bringing Innovate UK into the proposed new funding organisation.
- 2.2 UKRI's Board will be responsible for the organisation's strategic direction. The Board will consist of a Chair, Chief Executive Officer (CEO), Chief Financial Officer, and 9 to 12 members drawn from representative sectors including academia and industry. It is imperative that these positions are held by individuals of the very highest calibre. In welcoming the appointment of Sir John Kingman

as interim Chair of UKRI¹, the Society highlighted the potential for the Board to draw on both national and international talent, and to raise further the international profile of UK science. We continue to encourage the Government to ensure this is done.

- 2.3 Each of the nine Councils within UKRI will be led by an Executive Chair. The Councils will provide strategic oversight of activity in their fields of science and research. The Executive Chairs should be of the highest research standing and champion the full breadth of the UK science, research and innovation community. This includes through interaction with UKRI's leadership.
- 2.4 For UKRI to deliver on the Government's ambitions for a strengthened research and innovation system, it is essential that its strategy and operation is not driven only by the priorities of the Government or the Board (top down), but also by the research and innovation community (bottom up). In his Review of the Research Councils, Sir Paul Nurse envisaged this being realised through the establishment of an Executive Committee of the Heads of the Research Councils, which would advise the proposed cross-Council organisation, Research UK. Under the proposed reforms, the analogous Committee would include the Executive Chairs of the Research Councils, Innovate UK and Research England. The White Paper and Bill do not make reference to establishing a Committee of this kind, or to any other structures or arrangements that would underpin the collective work and decision-making of the Executive Chairs. **The Society believes that UKRI's governance arrangements should include an Executive Committee of the Councils' Executive Chairs, and that this should be a statutory requirement on the face of the Bill.**

Research Councils

- 2.5 The landscape of Research Councils has changed over time. The Bill giving the Secretary of State the authority to change their number, name, and fields of activity through a statutory instrument is a pragmatic reflection of this². While this change is reasonable, both Parliament and the research community should be able to inform and scrutinise properly any major proposed changes to Research Councils' form and function. **The Society believes the Bill should include a duty for the Secretary of State to consult with the research community on any proposal for major Research Council reform.**

Innovate UK

- 2.6 There has been considerable debate about whether or not Innovate UK should be part of UKRI³. **On balance, the Society believes the potential benefits of creating an organisation with an integrated overview of UK research and innovation infrastructure, assets and expertise outweigh the risks of a more fragmented structure, and that Innovate UK should be part of UKRI. It is essential that in creating UKRI, however, that Innovate UK's unique business-facing focus and links to its customer base are not put at risk.**
- 2.7 The benefits that the Society believes should be delivered by an integrated funding body are at least four-fold. First, following the UK's vote to leave the EU, a unified and strong voice for research and innovation could pay dividends in terms of ensuring that science is properly represented in negotiations. This includes on issues such as access to EU programmes, and wider dialogue on

¹ Royal Society, 2016. "The Royal Society comments on appointment of chair of UK Research and Innovation": <https://royalsociety.org/news/2016/05/response-to-announcement-chair-research-innovation/>

² Note that Research England and Innovate UK have their own additional protections so cannot be changed in this manner.

³ House of Lords Science and Technology Committee (2016). "The Future of Innovate UK inquiry – letter from the Earl of Selborne to the Science Minister": <http://www.parliament.uk/documents/lords-committees/science-technology/InnovateUK/2016-06-30-Future-of-InnovateUK-ltr-to-BIS-Minister.pdf>

the implication of withdrawal for national regulatory and policy reform and changes to the UK research landscape.

- 2.8 Second, bringing together within UKRI the capital and resource funding streams for higher education, research, and innovation should enable more efficient and strategic investment in national research programmes and capabilities. This could help address disconnects between capital investment and funding for operational costs (the “batteries not included” problem), which has led to some publicly funded research facilities not being used to full capacity due to shortfalls in the budget available to cover running costs.⁴.
- 2.9 Third, bringing Innovate UK together with the Research Councils could catalyse the development of programmes and practices that facilitate more effective interactions between industry, business and the research base and between disciplines and sectors. It might also better support researchers to work in and interact with the private sector, and vice versa. Embedding mechanisms to support this type of integrated and interdisciplinary working will be key to effectively tackling the complex societal and research challenges faced by the UK and the world.
- 2.10 Fourth, closer proximity of Innovate UK, the Research Councils and Research England could see business take a stronger role in shaping UK research, education and industrial strategy. This would include developing the talent of the research base, and the skills needed by industry across and within sectors. It might also better facilitate the sharing of good practice across funding organisations, including on career development and public engagement activities.

Other research and innovation funders

- 2.11 UK research and innovation is currently funded by a range of organisations other than the Research Councils and Innovate UK. For example, UK Space Agency works closely with STFC and NERC, and the National Institute for Health and Research with the MRC. **UKRI should consider how best to align its own research funding programmes with those of others to maximise the efficiency and reach of research and innovation spend. This should include with government departments.**

3 The interfaces between teaching and research

Governance and co-operation

- 3.1 The creation of the Office for Students (OfS) and UKRI would split the governance and funding arrangements for teaching and research. Recent changes to the machinery of government also mean that these responsibilities now fall to two government departments; the Department for Education (DfE) and the Department for Business, Energy and Industrial Strategy (BEIS).
- 3.2 The Minister of State for Universities and Science being appointed jointly to DfE and BEIS, and his being responsible for both OfS and UKRI is welcome. **It is important, however, that structures are put in place to generate shared organisational knowledge at every level.**
- 3.3 The Bill puts a legislative duty on OfS to assess institutions’ efficiency and financial sustainability and gives it responsibility for awarding research degrees. However, teaching and research are intrinsically linked within UK Higher Education Institutions (HEIs), not least because the staff, infrastructure and financial resources used to deliver research, education and innovation-related

⁴ House of Commons Select Committee (2015). “UK must increase science funding to keep up with competitors”: <https://www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/news-parliament-2015/the-science-budget-report-published-15-16/>

activities are often one and the same. **The Bill should include an additional duty for UKRI and OfS to cooperate on issues at the interface between teaching and research.** These would include the health and sustainability of disciplines and institutions, the awarding of research degrees, post-graduate training, shared facilities (including museums and libraries), knowledge exchange, and skills development. **This requirement to coordinate and cooperate should flow through both organisations' governance documents, operating frameworks and strategic plans.**

- 3.4 Links between teaching and research can support HEIs and other education providers to respond to emerging research, help students develop key skills and better equip graduates for employment. Education providers recognising the importance of supporting personal development is crucial in a world where individuals have portfolio careers, and where post-graduate students choose to pursue careers outside of academia. **UKRI and OfS should work together to ensure education providers focus on developing students' personal skills as well as their academic ones.**
- 3.5 **The Society recommends that UKRI use the powers granted to it in the Bill to establish a Committee on teaching and research.** This Committee could provide a cross-organisational forum to develop and promulgate practical ways of maintaining strong relationships between excellent teaching and excellent research. This should include exploring how best to ensure that every student benefits from the very best research-led teaching.
- 3.6 Currently, pedagogical research is primarily funded through ESRC. By bringing the Research Councils together with other funding agencies, this teaching and research Committee could play a pivotal role in developing and coordinating research to understand 'what works'. Centres for Doctoral Training should be encouraged to build on their pioneering work to encourage HEIs to invest in the personal as well as academic development of their students. This would include continuing to evaluate, publish and disseminate the many innovative and effective teaching tools and techniques that are developed within their communities.

Research and Teaching Assessment Frameworks

- 3.7 The recent Stern Review⁵ of the Research Excellence Framework (REF) highlighted the need to recognise the vital relationships between research and teaching. The Society raised this point in its evidence to the Review⁶, and is pleased to see it brought to the fore. One way this might be achieved is through the amendment of REF guidelines to better reward the impact of pedagogical research.
- 3.8 In responding⁷ to the Government's consultation on the design of the Teaching Excellence Framework (TEF), the Society emphasised that an effective TEF would need to recognise the relationship between teaching and research, use a broad range of metrics to recognise diversity of

⁵ Lord Stern, 2016. "Building on Success and Learning from Experience: An Independent Review of the Research Excellence Framework":

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/541338/ind-16-9-ref-stern-review.pdf.

⁶ The Royal Society, 2016. "Royal Society submission to the Stern Review of the Research Excellence Framework": <https://royalsociety.org/~media/policy/Publications/2016/24-03-16-royal-society-response-to-stern-Review.pdf>.

⁷ The Royal Society, 2016. "Consultation response - Teaching Excellence Framework technical consultation": <https://royalsociety.org/topics-policy/publications/2016/response-to-TEF-technical-consultation-letter-venki-ramakrishnan-jo-johnson/>.

practice and be as light touch as possible. The Society also recommended that the value of research-led teaching should be recognised throughout the TEF criteria.

HE Providers

- 3.9 The White Paper sets out the Government's plans to open up the HE marketplace to new providers. It may be challenging for new providers to deliver high quality STEM provision due to the required investment in equipment and facilities, and the development of close links between teaching and research. **Ensuring that any new provision meets high quality standards is important for the reputation of the UK HE sector.**
- 3.10 Alternative providers in the UK have so far focused on delivering lower cost subjects in the humanities, social sciences and business management, with very few offering more expensive laboratory-based subjects. **It is important that the implementation of reforms to the HE sector does not impact on existing providers' ability to cross-subsidise research and teaching activities across and within disciplines. The expansion of existing institutions with proven excellent STEM teaching may be an efficient and effective means of meeting the need for new student places in these subjects.**
- 3.11 Established providers are currently subject to a cap on the number of international students that can be enrolled on specific courses; medicine and dentistry, for example. It is essential that new and existing providers operate on a level playing field and are subject to the same regulations and constraints.

4 Strategic facilities and capabilities

Large Facilities

- 4.1 The UKRI Board will be accountable for cross-cutting decision-making, the management of major projects and shared data sets, and decision-making on capital investment. This is intended to ensure that investment and other decisions reflect and balance the needs and priorities of the research base as a whole.
- 4.2 A number of UK's Large Facilities already serve multiple communities. The Diamond Light Source, for example, is used by researchers in academia and industry and across disciplines, ranging from biochemistry to nanotechnology. An analysis of these and other research and innovation assets could provide valuable insights into how they can best be managed for the benefit of their often broad and diverse user base. **A review of the national landscape of strategic research capabilities and Large Facilities should be undertaken. The creation of UKRI provides an opportunity for this to be carried out.**

Interdisciplinary research

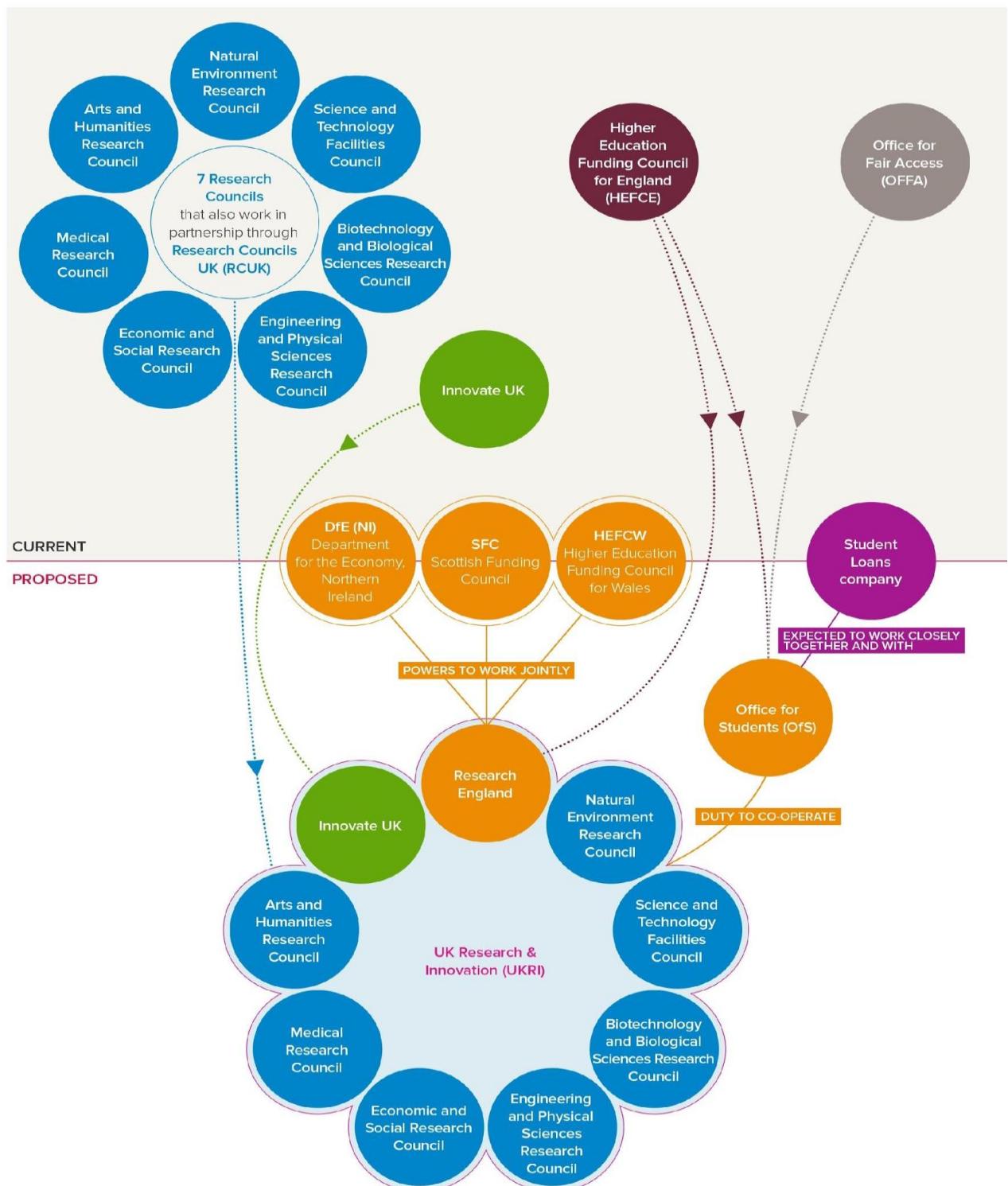
- 4.3 The White Paper outlines the Government's plans for UKRI to manage a common research fund and funds with cross-disciplinary impact. The cross-Council Global Challenges Research Fund (GCRF) might provide an opportunity to understand how best to manage delivery of joint-funding programmes.
- 4.4 Interdisciplinary research benefits from flexible funding that is not tied to a specific output or question. **All funding for interdisciplinary research should support a mixed portfolio of bottom-up, discovery-driven research and top-down research to tackle interdisciplinary**

challenges. UKRI should ensure that interdisciplinary research proposals to this or any other funding programme are evaluated against appropriate frameworks, and by skilled and experienced interdisciplinary researchers.

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Annex 1

UK higher education, research and innovation current and prospective landscape



Annex 2: Bill amendments proposed

This Annex provides amendments to the Higher Education and Research Bill that complement the Society's positions on the proposed reforms to the UK's higher education, research and innovation system. These amendments are intended to change the wording of the Bill to bring it in line with the Royal Society's position.

This Annex presents the Royal Society's individual contribution to the debate, and is additional to the briefing we jointly published with the other National Academies, which highlights issues questions raised by the proposed changes to the research landscape and provides a list of probing amendments that could be used to see further clarification. The joint National Academies briefing is available [here](#).

Governance and leadership

Royal Society position	Clause number and title	Proposed probing amendment	Amended clause	Rationale	Background
The Society believes that UKRI's governance arrangements should include an Executive Committee of the Councils' Executive Chairs, and that this be a statutory requirement on the face of the Bill.	Schedule 9	9 – Committees and sub-committees	Page 94, line 19, after “(in addition to the Councils).” insert “(a) UKRI must establish an Executive Committee of Councils’ Executive Chairs	(1) UKRI may establish committees (in addition to the Councils). (a) UKRI must establish an Executive Committee of the Executive Chairs of the Councils, chaired by the UKRI CEO.	An amendment to include an Executive Committee of the Councils’ Executive Chairs as a statutory requirement on the face of the Bill. For UKRI to deliver on the Government’s ambitions for a strengthened research and innovation system, it is essential that its strategy and operation is not driven only by government or Board priorities (top down), but also by the research and innovation community (bottom up). In his Review of the Research Councils, Sir Paul Nurse envisaged this being realised through the establishment of an Executive Committee of the Heads of the Research Councils, which would advise the proposed cross-Council organisation, Research UK. Under the proposed reforms, the analogous Committee would include the Executive Chairs of the Research Councils, Innovate UK and Research England. The White Paper and Bill do not make reference to establishing a Committee of this kind, or to

					<p>any other structures or arrangements that would underpin the collective work and decision-making of the Executive Chairs.</p> <p>The Society believes that UKRI's governance arrangements should include an Executive Committee of the Councils' Executive Chairs, and that that this should be a statutory requirement on the face of the Bill.</p>
Part 3					
91 - UKRI's research and innovation strategy	Page 55, line 8, after "approval" insert "(c) consult with a Committee of Executive Chairs of Councils in the development of UKRI's strategy"	(1) UKRI must— (a) if requested to do so by the Secretary of State, prepare a strategy for the exercise of its functions during the period specified in the request, (b) submit the strategy to the Secretary of State for approval, and (c) consult with a Committee of Executive Chairs of the Councils in the development of UKRI's strategy	An amendment to ensure the Bill requires UKRI must consult with the Executive Committee of the Councils' Executive Chairs in the development of UKRI's strategy	<p>For UKRI to deliver on the Government's ambitions for a strengthened research and innovation system, it is essential that its strategy and operation is not driven only by government or Board priorities (top down), but also by the research and innovation community (bottom up).</p> <p>In his Review of the Research Councils, Sir Paul Nurse envisaged this being realised through the establishment of an Executive Committee of the Heads of the Research Councils, which would advise the proposed cross-Council organisation, Research UK. Under the proposed reforms, the analogous Committee would include the Executive Chairs of the Research Councils, Innovate UK and Research England. The White Paper and Bill do not make reference to establishing a Committee of this kind, or to any other structures or arrangements that would underpin the collective work and decision-making of the Executive Chairs.</p>	

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The Society believes the Bill should include a duty for the Secretary of State to consult with the research community on any proposal for major Research Council reform.	84 - The Councils of UKRI	Page 51, line 39, after "Secretary of State" insert "following consultation"	(2) The Secretary of State, following consultation , may by regulations amend subsection (1) so as to— (a) add or omit a Council, or (b) change the name of a Council.	An amendment to include a duty for the Secretary of State to consult with the research community ahead of any proposed changes to the Research Councils' form and functions	<p>The current wording of the Bill would allow the Secretary of State to add or omit Councils or change the name of a Council by issuing a statutory instrument subject to affirmative resolution procedure. This means it will automatically be debated in parliament and must be approved by both Houses.</p> <p>The landscape of Research Councils has changed over time. The Bill giving the Secretary of State the authority to change their number, name, and fields of activity through a statutory instrument is a pragmatic reflection of this. While this change is reasonable, both Parliament and the research community should be able to inform and scrutinise properly any major proposed changes to Research Councils' form and function.</p> <p>The Society believes the Bill should include a duty for the Secretary of State to consult with the research community on any proposal for major Research Council reform.</p>
	87 - Exercise of functions by science and humanities councils	Page 53, line 36, after "State" insert "following consultation"	(5) The Secretary of State, following consultation , may by regulations— (a) amend the first column of the table in subsection (1) in consequence of provision	An amendment to include a duty for the Secretary of State to consult with the research community ahead of	The current wording of the Bill would allow the Secretary of State to add or omit Councils or change the name of a Council by issuing a statutory instrument subject to affirmative resolution procedure. This means

			<p>made by regulations under section 84; (b) amend the second column of that table.</p>	<p>any proposed changes to the Research Councils' form and functions</p>	<p>it will automatically be debated in parliament and must be approved by both Houses.</p> <p>The landscape of Research Councils has changed over time. The Bill giving the Secretary of State the authority to change their number, name, and fields of activity through a statutory instrument is a pragmatic reflection of this. While this change is reasonable, both Parliament and the research community should be able to inform and scrutinise properly any major proposed changes to Research Councils' form and function.</p> <p>The Society believes the Bill should include a duty for the Secretary of State to consult with the research community on any proposal for major Research Council reform.</p>
90 - Exercise of functions by the Councils: supplementary	Page 54, line 41, after "may" insert "with consultation"	(2) A function of UKRI which is exercisable by a Council on UKRI's behalf pursuant to arrangements under sections 87 to 89 or subsection (1) may, with consultation , also be exercised by UKRI in other ways.	An amendment to include a duty for the Secretary of State to consult with the research community ahead of any proposed changes to the Research Councils' form and functions	<p>The current wording of the Bill would allow the Secretary of State to add or omit Councils or change the name of a Council by issuing a statutory instrument subject to affirmative resolution procedure. This means it will automatically be debated in parliament and must be approved by both Houses.</p> <p>The landscape of Research Councils has changed over time. The Bill giving the Secretary of State the authority to change their number, name, and fields of activity through a statutory instrument is a pragmatic reflection of this. While this change is reasonable, both Parliament and the research community should be able to inform and scrutinise properly any major</p>	

					<p>proposed changes to Research Councils' form and function.</p> <p>The Society believes the Bill should include a duty for the Secretary of State to consult with the research community on any proposal for major Research Council reform.</p>
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The interfaces between teaching and research

Royal Society position	Clause number and title	Proposed probing amendment	Amended clause	Rationale	Background
The Bill should include a specific and additional duty for UKRI and OfS to cooperate on issues at the interface between teaching and research.	103 - Cooperation and information sharing between OfS and UKRI	Page 59, line 10, after "functions" insert "The OfS and UKRI must cooperate with one another on - (a) the health of disciplines (b) awarding of research degrees (c) post-graduate training (d) shared facilities (e) knowledge exchange and (f) skills development"	(1) The OfS and UKRI may cooperate with one another in exercising any of their functions. The OfS and UKRI must cooperate with one another on - (a) the health of disciplines (b) awarding of research degrees (c) post-graduate training (d) shared facilities (e) knowledge exchange and (f) skills development	An amendment to include a specific and additional legislative duty for UKRI and OfS to cooperate on issues at the interface between teaching and research	<p>The Bill puts a legislative duty on OfS to assess institutions' efficiency and financial sustainability and gives it responsibility for awarding research degrees. However, teaching and research are intrinsically linked within UK higher education institutions, not least because the staff, infrastructure, and financial resources used to deliver research, education and innovation-related activities are often one and the same.</p> <p>The Bill should include a specific and additional legislative duty for UKRI and OfS to cooperate on issues at the interface between teaching and research. These would include the health and sustainability of disciplines and institutions, the awarding of research degrees, post-graduate training, shared facilities (including museums and libraries), knowledge exchange, and skills development.</p>