

25 January 2019

Brexit, Science and Innovation: Preparations for 'No-Deal' inquiry

Key points

- **No-deal is a very bad deal for science. If we leave without a deal, it will impact on scientific research immediately and could take years to rebuild.**
 - 1 in 6 academic staff in UK Higher Education Institutions are from elsewhere in the EU. They can easily choose to build their careers elsewhere.
 - The UK could immediately lose access to over £1 billion a year in EU research funding. It could take years to develop alternatives, meaning that valuable research could be stopped in its tracks.
 - We lose access to new medicines and technologies and limit our ability to tackle global problems as regulatory and governance arrangements fall apart.
- **UK research and innovation needs a deal that:**
 - Keeps highly-skilled scientists working in the UK and ensures that international talented people still choose to come here and contribute to our globally competitive science
 - Keeps access to money and networks which support the UK to work with scientists around the world by ensuring that the UK remains in Horizon 2020 to its end and seeks full association with its successor, Horizon Europe
 - Maintains regulatory alignment that allows access to new medicines and new technologies
- **Government has made some helpful commitments and guarantees to reduce the impact of no-deal Brexit on UK science. However there are further immediate actions that they should take now:**
 - Confirm that additional money will be made available to BEIS in the event of no-deal Brexit, alongside the existing guarantees, to cover the costs of establishing alternative funding for UK researchers no longer able to access European Research Council, Marie-Sklodowska Curie Actions and the SME Instrument Programmes.
 - Take all opportunities to promote the UK's commitment that it will always welcome global research and innovation talent.
- **In the event of no-deal Brexit, there are a number of actions that the government should take to reduce the damage that this will do to UK research and innovation.**
 - Demonstrate the UK's commitment to seek "the option to fully associate ourselves with the excellence-based European¹ science and innovation programmes – including the successor to Horizon 2020 and Euratom R&T" by committing the money to do so at the next Spending Review.
 - Demonstrate the UK government's commitment for 2.4% of GDP to be invested in UK R&D by 2027 and 3% in the longer term by publishing a roadmap alongside the next spending review, including public spending commitments up to 2027, to provide certainty to the research and innovation community and confidence to those investing in UK R&D.
 - Ensure that the UK's future immigration system supports research and innovation.
 - Undertake thorough public consultation before diverging from EU legislation to ensure that there are no unintended impacts on research and innovation.

Introduction

1. The Royal Society welcomes the opportunity to submit evidence to the Committee's inquiry into Brexit, Science and Innovation: Preparations for 'No-Deal'. The Society is the National Academy of Science for the UK and the Commonwealth. It is a self-governing Fellowship of many of the

¹ Approximately 15,000 research visas were issued in the year ending 31 December 2017 across Tier 1 (Exceptional Talent), Tier 2 (General) and Tier 5 (Government Authorised Exchange). Since the number of non-UK EEA researchers in the UK is roughly double that of non-EEA, we can infer that requiring work permits for all researchers could treble the overall visa requirement

world's most distinguished scientists working across a broad range of disciplines in academia and industry. The Society draws on the expertise of its Fellows and Foreign Members to provide independent and authoritative scientific advice to UK, European and international decision makers.

2. UK science punches well above its weight. Scientific research and innovation are essential for UK jobs, healthcare and improving quality of life for us and people around the world. This research and innovation is increasingly global and UK researchers are themselves from around the world (throughout this submission, references to 'UK researchers' refers to 'UK-based researchers' not UK nationals). The UK's reputation for excellence attracts people from around the world, and allows the UK to compete with other scientifically excellent nations for international talent.
3. As well as attracting international talent to work here, UK researchers themselves work with others around the world. Global collaborations are increasingly important for cutting-edge research, enabling researchers in the UK to work with the best teams, wherever they are. Seven EU countries are among the UK's top ten strongest scientific collaborators, forging relationships that are valuable to both countries².
4. Being part of the EU has played a huge role in the UK becoming a global scientific powerhouse and magnet for talent, as part of a strong European Research Area that can compete on the scale of other scientific superpowers, such as the USA and China. If you look at this relationship solely in monetary terms – not taking into account the networks and collaborations that this supports – the UK receives over £1 billion a year from the EU to support research and innovation³, making up part of the 1.67% of GDP that is currently invested into UK R&D⁴ and this funding leverages further investment⁵. Therefore changes to the UK's relationship with the EU, and so access to these funding streams, will impact on the UK's government's ability to deliver the 2.4% target by 2027.

What would a No-Deal Brexit mean for the science and innovation community?

Access to European research funding and networks:

5. In the event of the UK leaving the EU without a deal, it would immediately go from being a full member of Horizon 2020 to becoming a third country. As a third country, UK researchers will be able to access some Horizon 2020 funding on an effectively 'pay to play' model⁶, while they will

² Data & Analysis: Clarivate Analytics, InCites available here: <https://royalsociety.org/topics-policy/projects/uk-research-and-innovation/research-innovation-mapping/#story=2&chapter=6> This map uses publication data of the UK's top collaborative partners to show the strength of collaboration between publications co-authored by UK-based and overseas researchers, with higher numbers indicating stronger degree of collaboration. The data is based on publication data available.

³ Annual UK research funding from the EU calculated using the average Horizon 2020 funding received by the UK per year between 2015 – 2017 plus the average amount received by the UK through ESIF to support research and innovation activities calculated by Technopolis (2017) *The role of EU funding in UK research and innovation – an analysis commissioned by the UK's National Academies – The Royal Society, British Academy, Academy of Medical Sciences and Royal Academy of Engineering*. This gives an average of Euro 1.5 billion per year.

⁴ See Royal Society, Royal Academy of Engineering, Academy of Medical Science, British Academy (2017) *Investing in UK R&D* figure 1 <https://royalsociety.org/~media/policy/projects/investing-in-uk-r-and-d/investing-in-UK-r-and-d-may-update-2018.pdf> [accessed 23 September 2018]

⁵ Technopolis (2017) *The role of EU funding in UK research and innovation – an analysis commissioned by the UK's National Academies – The Royal Society, British Academy, Academy of Medical Sciences and Royal Academy of Engineering*.

⁶ EU Commission (2017) *Guidance note— Funding of applicants from non-EU countries & international organisations* http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cpart/h2020-hi-3cpart_en.pdf

be unable to participate in a number of schemes, notably the majority of schemes operated by the European Research Council⁷, Marie Skłodowska Curie Actions and the SME Instrument⁸.

6. The UK government has provided two guarantees intended to ensure that UK-based researchers can continue to participate in Horizon 2020 to its end in the event of no deal.
 - a. **All successful bids for Horizon 2020 funding submitted before exit day will be funded by the UK government:** the Chancellor announced in August and October 2016 that the government will guarantee funding for competitively bid for EU projects submitted before we leave the EU, including Horizon 2020 projects. This guarantee will cover all successful bids submitted by UK participants before the UK exits the EU, for the full duration of the projects.⁹
 - b. **The government will ‘pay to play’ as a third country after exit day:** In July 2018, the Chief Secretary laid a written ministerial statement (HCWS926) extending this guarantee to provide further stability for UK organisations in a ‘no deal’ scenario. The guarantee now additionally covers funding for successful bids where UK organisations are able to participate as a third country in competitive EU grant programmes. This extension runs from exit day until the end of 2020.¹⁰

However these guarantees do not address UK researcher’s loss of access to European Research Council, Marie Skłodowska Curie Actions and the SME Instrument programmes. Together these schemes invest approximately half a billion pounds into UK R&D annually¹¹ supporting valuable research. It could take years to develop alternatives, meaning that this research could be stopped in its tracks. It is also important to note that UK researchers could still apply to participate in the European Research Council and Marie Skłodowska-Curie Actions and if successful, choose to take this funding up in an EU country, i.e. leaving the UK¹².

7. Horizon Europe, the successor to Horizon 2020 that is due to begin in 2021, is still being agreed through the EU’s legislative process. The Prime Minister has stated her intention to seek “the option to fully associate ourselves with the excellence-based European science and innovation programmes – including the successor to Horizon 2020 and Euratom R&T”¹³. As an EU

⁷ The European Research Council recently announced that for the first time under the 2019 Work Programme, one Principal Investigator per Synergy Grant group at any one time can be hosted or engaged by an institution outside of the EU or Associated Countries

<https://erc.europa.eu/funding/synergy-grants>

⁸ BEIS (2018) *Guidance Horizon 2020 funding if there’s no Brexit deal* <https://www.gov.uk/government/publications/horizon-2020-funding-if-theres-no-brexite-deal/horizon-2020-funding-if-theres-no-brexite-deal--2>

⁹ BEIS (2018) *Guidance Horizon 2020 funding if there’s no Brexit deal* <https://www.gov.uk/government/publications/horizon-2020-funding-if-theres-no-brexite-deal/horizon-2020-funding-if-theres-no-brexite-deal--2>

¹⁰ BEIS (2018) *Guidance Horizon 2020 funding if there’s no Brexit deal* <https://www.gov.uk/government/publications/horizon-2020-funding-if-theres-no-brexite-deal/horizon-2020-funding-if-theres-no-brexite-deal--2>

¹¹ The UK Government’s guarantee announced on 24 July 2018 will cover the cost of UK participation in Horizon 2020 as a third country in the event of leaving the EU with no deal. As a third country, UK-based academics will not be able to access funding from the European Research Council or Marie Skłodowska-Curie Actions and UK-based SMEs will not be able to access SME Instrument funding. Over the period 2015-17, the UK received an annual average of Euro 601 million from these three funding streams. See <https://royalsociety.org/~media/policy/projects/brexit-uk-science/references-and-workings-for-brexit-no-deal-factsheet.xlsx> for the calculations on which this is based.

¹² European Commission, Participant Portal H2020 Online Manual, http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation_en.htm

¹³ Theresa May (2018) *PM speech on science and modern Industrial Strategy: 21 May 2018*

<https://www.gov.uk/government/speeches/pm-speech-on-science-and-modern-industrial-strategy-21-may-2018>

Member State, the UK has not had an Association agreement to the EU Framework Programmes before. We are concerned that a no-deal Brexit may make it less easy to associate with Horizon Europe, particularly if there has been a break in access to a considerable amount of research funding following exit day, which would erode the strength of the UK's research base in the interim.

8. Framework programmes are not the only way that the EU supports research and innovation in the UK. European Regional Development Funds are also a valuable source of research and innovation funding, with certain parts of the UK particularly dependent on this. For example, Wales is estimated to receive €388m between 2014-2020, equivalent to €125 per capita. Northern Ireland, similarly, is set to receive € 113m, equivalent to € 60 per capita. The UK average is € 23 per capita¹⁴. In the event of no-deal Brexit, UK organisations would be unable to access EU funding for European Regional Development Fund projects after exit day. However equivalent UK government guarantees to those made for Horizon 2020 are intended to ensure that there is no gap in funding for regional growth in the event of a no-deal¹⁵. In the longer term, the UK government proposed a UK Shared Prosperity Fund in its Industrial Strategy to ensure that local areas continue to receive flexible funding for their local needs. The government plans to consult on the precise design and priorities for the fund in 2019¹⁶.
9. Research by Technopolis has shown that some academic disciplines are more dependent on EU research funding than others and would consequently be at risk of being hit harder in a 'no deal' scenario if this is not addressed.¹⁷

Mobility:

10. UK researchers are from all over the world and the ability to move is important for them to work with others around the world, and develop their career. 12% of UK academic researchers come from outside the EU and must navigate the UK's immigration system. 17% of UK academic researchers come from elsewhere in the EU¹⁸ and are currently able to live and work in the UK under freedom of movement. **In the event of no deal, this is not expected to change immediately, although there is limited clarity on this.** The Immigration and Social Security Co-ordination (EU Withdrawal) Bill 2017-19 that is currently under scrutiny by the Houses of Parliament will put in place the necessary legislation to end free movement and create the legal framework for a future system to apply to both EU and non-EU nationals, which will take time to implement. In the interim, the UK government has instigated an EU Settlement Scheme for non-UK EU nationals living and working in the UK. The deadline for applying will be 31 December 2020 if the UK leaves the EU without a deal, up to which point EU citizens will continue to be able to rely on their passport (as a British citizen may) or national identity card if they are asked

¹⁴ Technopolis (2017) *The role of EU funding in UK research and innovation – an analysis commissioned by the UK's National Academies – The Royal Society, British Academy, Academy of Medical Sciences and Royal Academy of Engineering.*

¹⁵ BEIS (2018) *Guidance: European Regional Development Funding if there's no Brexit deal*

<https://www.gov.uk/government/publications/european-regional-development-funding-if-theres-no-brexite-deal/european-regional-development-funding-if-theres-no-brexite-deal>

¹⁶ HM Government (2017) *Industrial Strategy: Building a Britain fit for the future*

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf

¹⁷ Technopolis (2017) *The role of EU funding in UK research and innovation* <https://royalsociety.org/topics-policy/publications/2017/role-of-eu-funding-in-uk-research-and-innovation/>

¹⁸ Higher Education Statistics Agency. 2017 Staff numbers and characteristics. See <https://www.hesa.ac.uk/data-and-analysis/staff> (accessed 14 March 2018). Figures include academic staff with functions in research, in teaching or neither. Numbers are rounded.

to evidence their right to reside in the UK¹⁹. The rights of EU nationals entering the UK after exit day are less clear. The UK government will be consulting on the proposals for the future system published in the Immigration White Paper during 2019.

11. Even though free movement for non-UK EU nationals to the UK is likely to continue in the immediate term in the event of no-deal, there are a number of considerations that may impact on research and innovation:
 - a. Given that the UK's future immigration policy is still in development, EEA nationals working in the UK will have little clarity over their long-term future. They can easily choose to build their careers elsewhere.
 - b. Conversely it is not clear what limitations will be placed on UK nationals' ability to travel and work in other EU countries were the UK to leave without a deal. This will be up to each EU country to decide through its own immigration policy. This could potentially limit the ability of UK nationals to move, and may therefore have an immediate impact on UK participation in international collaborations and networks, and access to research infrastructure based elsewhere in the EU.
 - c. More generally, the UK may appear to be much less welcoming to scientific talent internationally making us much less the destination of choice.

Regulation and governance:

12. The European Union (Withdrawal) Act 2018 will keep most existing EU law as UK domestic law after Brexit in order to ensure the continuity and completeness of the UK's legal system, even if the UK leaves without a deal. However, without a deal, there is little clarity over how UK and EU law might diverge going forward, and this may have implications for UK participation in research collaborations and future funding programmes. For example, the Clinical Trials Regulation is due to come into force in March 2020. The UK government has committed to "give priority to taking the steps necessary to bring into UK law, without delay, all relevant parts of the EU regulation that are within the UK's control, so that those planning clinical research can do so with certainty²⁰" in the event of no-deal. However several elements of the Regulation are outside the UK's control and will therefore be dependent on further negotiation. International collaboration enabled by the Clinical Trials Regulation is vital for clinical research, and means UK patients can continue to access potentially life-saving experimental treatments. It is particularly important for rare, less common and paediatric diseases, where patient populations in individual countries are often too small to recruit sufficient numbers. 75% of clinical trials in the EU involve cross-national collaboration, and this rises to 86% for rare disease trials²¹.

The adequacy of what the government and its non-departmental public bodies are doing to prepare for such an outcome

The Horizon 2020 Guarantees:

13. As detailed above, the UK government has provided two guarantees intended to ensure that UK-based researchers can continue to participate in Horizon 2020 to its end in the event of no-deal. They have confirmed that these will be funded from additional money, i.e. not taken from

¹⁹ DExEU (2018) *Citizens' Rights - EU citizens in the UK and UK nationals in the EU Policy Paper* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/76222/Policy_paper_on_citizens_rights_in_the_event_of_a_no_deal_Brexit.pdf

²⁰ Hansard 18 April 2018 House of Lords, debate of European Union (Withdrawal) Bill: available here <http://bit.ly/2MpvWYb>

²¹ (2018) *Joint statement on Clinical Trials Regulation* <https://royalsociety.org/~media/policy/Publications/2018/04-16-18-joint-statement-on-Clinical-Trials-Regulation.pdf>

money already earmarked for research and innovation, and will be made available to departments by HM Treasury in the event of no-deal Brexit²².

14. However, without an association agreement to Horizon 2020, UK researchers will still not be able to participate in some Horizon 2020 programmes: specifically the majority of schemes operated by the European Research Council, Marie Skłodowska Curie Actions and the SME Instrument. The government has stated that “We are working with stakeholders to identify appropriate measures that could be put in place in the period immediately after EU Exit, if needed.”²³ Given that these programmes represent approximately half a billion pounds of funding currently flowing to UK researchers each year to support valuable research projects, it is important for the health of the UK’s research and innovation system that these preparations take place. The National Academies are in regular discussions with the government to support this work.
15. Should it become necessary, it will take time to develop domestic alternatives to these programmes. To avoid a break in funding and resulting loss of momentum within the UK’s research base, it is important that money is rapidly made available to deliver alternative funding in a no-deal Brexit scenario. **The government should confirm now that additional money will be made available to BEIS in the event of no-deal Brexit, alongside the existing guarantees, to cover the costs of establishing alternative funding for UK researchers no longer able to access European Research Council, Marie Skłodowska Curie Actions and the SME Instrument programmes.**

Mobility:

16. As detailed above, UK immigration arrangements are not expected to change in the short-term, but there is considerable uncertainty over the future. However, the UK government has clearly stated that it values global research and innovation talent with the Immigration White Paper stating:

“The UK will always welcome global research and innovation talent – the diversity of ideas and perspectives helps us to achieve more in scientific and technological endeavours than we could ever achieve alone. The future immigration system will continue to recognise these contributions.”²⁴

and the Prime Minister has committed to ensure that our international workforce does not change when we leave the European Union²⁵. **The UK government should take all opportunities to promote its commitment that it will always welcome global research and innovation talent, both to international researchers already working in the UK, and those abroad who may be considering whether to come and work here. A thorough process of consultation on the UK’s future immigration system must be undertaken to ensure that it supports research and innovation.**

Regulation and governance:

²² Commons Written Question - 199420 (11 December 2018) *Research: EU Grants and Loans*

<https://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2018-12-05/199420>

²³ BEIS (2018) *Guidance Horizon 2020 funding if there’s no Brexit deal* <https://www.gov.uk/government/publications/horizon-2020-funding-if-theres-no-brexite-deal/horizon-2020-funding-if-theres-no-brexite-deal--2>

²⁴ HM Government (2018) *The UK’s future skills-based immigration system* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/766465/The-UKs-future-skills-based-immigration-system-print-ready.pdf

²⁵ Prime Minister (21 May 2018) *Speech on science and modern Industrial Strategy* <https://www.gov.uk/government/speeches/pm-speech-on-science-and-modern-industrial-strategy-21-may-2018>

17. In a 'no deal' scenario the UK would not be legally committed to medium or long-term regulatory alignment with the EU. Divergence from developing EU legislation would be possible in due course. The government has published a number of technical notices offering guidance for continued planning in the event of no deal. These are helpful in the short term to inform contingency planning, but in the event of no-deal Brexit, any divergence from the status quo must be informed by thorough public consultation to ensure that there are no unintended impacts on research and innovation.

Looking beyond no-deal

18. In the event of no-deal Brexit, there are a number of actions that the government should take to reduce the damage that this will do to UK research and innovation.
- **Demonstrate the UK's commitment to seek "the option to fully associate ourselves with the excellence-based European²⁶ science and innovation programmes – including the successor to Horizon 2020 and Euratom R&T" by committing the money to do so at the next Spending Review.** These funds should ensure that going forward excellent research and innovation receives at least the same support as it currently does through EU research and innovation programmes, currently Horizon 2020.
 - **Demonstrate the UK's commitment for 2.4% of GDP to be invested in UK R&D by 2027 and 3% in the longer term by publishing a roadmap alongside the 2019 spending review, including public spending commitments up to 2027 to provide certainty to the research and innovation community and confidence to those investing in UK R&D.**
 - **Ensure that the UK's future immigration system supports research and innovation.** Future immigration arrangements can more effectively address the UK's skills needs by recognising different career paths and different needs. We estimate that if the UK were to bring EEA nationals in line with the rest of the world after the UK's withdrawal from the EU, this could treble the number of science and research visas being issued annually. It is important that universities and businesses are equipped for this increased burden so that the UK can continue to attract those individuals the UK needs to thrive.

For further information, please contact Becky Purvis, Head of Public Affairs, on becky.purvis@royalsociety.org

²⁶ Approximately 15,000 research visas were issued in the year ending 31 December 2017 across Tier 1 (Exceptional Talent), Tier 2 (General) and Tier 5 (Government Authorised Exchange). Since the number of non-UK EEA researchers in the UK is roughly double that of non-EEA, we can infer that requiring work permits for all researchers could treble the overall visa requirement