House of Commons Science and Technology Select Committee - Brexit: science and innovation summit inquiry

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Written evidence submitted by the Institution of Environmental Sciences (IES)

The Science and Technology Select Committee is hosting a Brexit science and innovation summit on 22nd February 2018 to identify actions needed now to mitigate risks and exploit opportunities for UK science, research and innovation after leaving the EU.

In advance of the summit, the committee invited written evidence submissions to inform the initiative. Full details can be found in the inquiry terms of reference.

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1. Background

1.1 The Institution of Environmental Sciences (IES) is a membership organisation that represents over 3,000 professionals from fields as diverse as air quality, land contamination and education - wherever you find environmental work underpinned by science. A visionary organisation leading debate, dissemination and promotion of environmental science and sustainability, the IES promotes an evidence-based approach to decision and policy making.

1.2 The Committee of Heads of Environmental Sciences (CHES) is the collective voice of the environmental sciences and related programmes in Higher and Further education. CHES plays a leading role in the Higher and Further Education Environmental Science communities and advocates for environmental science within education. After working closely together for over a decade, CHES merged with the IES in 2013 and now serves as its education committee. Together, the IES and CHES now accredit over 100 degree programmes in the UK and abroad, including more than 20 Masters courses.

1.3 This submission draws upon research conducted by the Institution before and following the referendum - some of which has been submitted to previous inquiries of the House of Lords and House of Commons Science and Technology Select Committees - as well as views, experience and analysis of members and others across the sector. In this submission we highlight key issues which we consider should be priorities as the Government progresses to phase two of the Brexit negotiations. Focusing on the environmental science sector in particular, in the context of UK science in general, this submission highlights challenges which the committee may wish to consider during its Brexit summit and in its recommendations to the Government.

2. Participation in EU research funding programmes

2.1 It is vital to maintain the strength of the UK science base in order to deal with the major social, economic and environmental challenges we currently face both domestically and globally. Recent moves by the Government to increase research and innovation funding are welcome steps in this regard, although there is still more to be done to keep pace with our international competitors. At the IES, we also

recognise the particular importance of adequate support for 'challenge-focused', or applied science, to tackling these challenges.

2.2 **Challenge focused research**

It is very important to recognise the significant contribution EU funding has made to this type of research. Designed to complement the funding systems of individual Member States (in theory according to the subsidiarity principle), the EU (through the Framework Programmes, including the current scheme, Horizon 2020, and the European Research Council: ERC) does not tend to fund much basic research, but rather focuses on investigator-led, 'frontier research' which spans the fundamental-applied divide. In this way, funding can be directed to fields which are showing promise with greater flexibility than is generally possible through structures such as the UK Research Councils. The UK's withdrawal from the EU therefore represents a significant risk to researchers based here who are working in such frontier areas, as a key funding stream may now be under threat.

2.3 Although some researchers and universities are already reporting a fall in their share of EU funding, UK institutions are able to participate until the end of the Horizon 2020 programme, and the Government's commitment to underwrite bids for projects made whilst the UK is still a member of the EU is welcome. The Government has indicated it is interested in participating in some EU budgetary programmes beyond 2020, in the next Multiannual Financial Framework (MFF) period as a non-Member State[1]. An agreement should be reached on the extent of this participation, as it applies to research funding programmes, as soon as possible.

2.4 **Interdisciplinary research**

Interdisciplinary environmental science research is essential if we are to transition to a sustainable society, and make our communities resilient in the face of major environmental threats such as flooding, climate change, air pollution and soil degradation. It supports major international commitments such as those pertaining to addressing climate change, nature conservation, chemical safety, transboundary pollution impacts and a range of other issues important for the health of the public and of our supportive ecosystems; abiding by such commitments is in many cases a prerequisite for international trade. Moreover, the low carbon and environmental sector is now a major contributor to the UK economy, supports hundreds of thousands of jobs, and exports billions of pounds worth of goods and services. During the last recession, data shows that the low carbon and environmental sector defied broader economic trends and continued to grow[2]. Investment in renewable energy now exceeds that in traditional generation as renewables become cost-competitive with fossil generation[3]. This growth is underpinned by conditions which incentivise innovation and ambitious interdisciplinary research (often with uncertain outcomes), and a strong science skills base.

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[1] Joint Report from the Negotiators of the European Union and the United Kingdom Government on progress during Phase 1 of negotiations under Article 50 TEU on the United Kingdom's orderly withdrawal from the European Union. TF50 (2017) 19, 8 December 2017, paragraph 73

[2] Green Alliance (2012) Green economy: a UK success story, http://www.green-alliance.org.uk/page_52.php

[3] REN21. (2016). Renewables 2016: Global Status Report. http://www.ren21.net/wpcontent/uploads/2016/06/GSR_2016_Full_Report.pdf

2.5 Social and environmental processes and challenges do not respect disciplinary boundaries, and nor does the knowledge economy, so funding for interdisciplinary research is essential. Although ongoing changes to the institutional architecture of the UK funding regime may make a difference in this area, there are well documented deficiencies in the UK Research Council system regarding the funding of interdisciplinary research, which is often considered high risk. By contrast, the ERC's Scientific Council encourages interdisciplinary applications. In guidance to peer reviewers, it is explicitly stated that the priority is to select the best science, "independent of its discipline and independent of the particularities of the review panel structure"[4].

2.6 **The benefits of participation in EU research programmes for the UK environmental science sector**

As we reported to the previous committee in 2016, historically the UK has had a strong track record in winning a disproportionately high level of EU research funding relative to its size, and the environmental sciences are no exception. Under the seventh EU Framework Programme for Research and Innovation (FP7) from 2007 to 2013, €1,704 million was spent on projects falling under the 'Environment' theme[5]. Of the 4,055 projects funded under the FP7-Environment theme (according to the Community Research and Development Information Services; CORDIS), 603 were based in the UK, second only to Germany, with 645[6].

2.7 The UK has also been extremely successful at securing European Research Council (ERC) funding in the environment sciences, due to the strength of our science base in this sector. Since 2007, the ERC Peer Review Evaluation Panel for Earth System Science (PE10: the panel whose remit most closely aligns with environmental science) has awarded funding for 74 projects to UK host institutions[7]. This is a significantly greater number of projects than awarded to institutions in any other Member State, with France the next highest at 42. This success is due to the excellence of UK science.

2.8 Not only does scientific research in the UK currently benefit from significant financial support from EU programmes, the increased competition for funding under these schemes (a product of the large number of eligible institutions across the EU Member States) drives up standards and ambition in research. The significant value of EU research grants, which in the 'Advanced' ERC category (for established researchers with strong track records as field leaders) can be worth up to €2.5 million over five years, combined with the increased collaboration with EU

[4] ERC (2015) ERC Frontier Research Grants Guide for peer reviewers, Ref. Ares(2015)1056537, https://erc.europa.eu/sites/default/files/document/file/Guide-for-Peer_reviewers_StG_CoG_AdG_2015.pdf

[5] https://ec.europa.eu/research/fp7/index_en.cfm?pg=budget

[6] http://cordis.europa.eu/projects/result_en?q=(contenttype%3D%27project%27%20OR%20/result/relations/categories/resultCategory/code%3D%27brief%27,%27report%27)%20AND%20programme/pga%3D%27FP7-ENVIRONMENT%27

[7] https://erc.europa.eu/projects-figures/erc-funded-projects/results?f[0]=sm_field_cordis_project_hi_count%3AUnited%20Kingdom&f[1]=sm_field_cordis_project_subpanel%3APE10&f[2]=xml_panel%3APE10 (Statistics up to date as of 26/1/18)

colleagues, enable the ambitious research programmes which this competition encourages.

2.9 Careful consideration must be given to the potential options for future participation in these programmes, in close collaboration with stakeholders from across the science and research sectors. Given the UK's new circumstances, it is also now important that the Government, in collaboration with the research sector, enhances its efforts to develop new partnerships outside the EU. This could include a greater role for the British Council in brokering research partnerships, and action to enhance our important links with research institutions in the Commonwealth nations, who may have much to offer in terms of funded, high-level scientific collaborations. These opportunities have always been available, but with the UK leaving the EU, stimulating these links and collaborations will take on a new significance.

2.10 In summary, as environmental science is highly interdisciplinary, our sector has seen particular benefits from EU funding mechanisms. The potential loss of access to these schemes is therefore a significant risk, the magnitude of which will depend upon the relationship ultimately negotiated with the EU. However, in addressing this risk, it is important to recognise that the benefits these EU research programmes have delivered are much greater than the monetary value of the grants themselves. As explained, the collaboration and competition involved in these bids promotes and fosters ambitious and innovative research, which can deliver benefits for our environment, economy and society.

3. Collaboration and mobility

3.1 Collaboration in academia

For the UK science sector to thrive, we need to be able to attract the best researchers and students into UK Institutes and Universities. If the ability of the best scientists from EU nations to move to the UK to work or study is compromised as a result of the referendum, this would represent a significant risk to our world-leading science base.

3.2 The UK/EU joint report after Phase 1 of negotiations does make clear that EU citizens living lawfully in the UK before exit day from the European Union will be able to remain. This is a welcome move. However, there is still significant uncertainty regarding the future immigration regime. The Government must act quickly to counter this uncertainty and provide some reassurance by developing a plan (in discussion with the sector) which will ensure that the most talented researchers and students from all over the world can continue to access UK institutions.

3.3 Access to skills and collaboration in applied science

For environmental scientists working outside of academia, the free movement of people within the EU has also been important, as it has enabled companies to employ the best experts without barriers. Ensuring businesses can retain access to vital science skills and knowledge under new immigration arrangements should be another priority for the Government.

3.4 In a pre-referendum survey of IES members, one frequently raised point was that access to skilled professional scientists from the EU is very important to many environmental businesses in the UK. Studies have shown that other developed countries are outperforming the UK on certain skills measures[8], with shortages documented in some higher skilled areas. The easy transfer of personnel across EU borders has therefore been important for the skills base in the sector, and for maintaining the UK's international competitiveness in light of this trend.

3.5 The majority of IES members are scientists employed in commercial organisations, with expertise across the environmental sector. Historically, UK based organisations have been successful in winning projects within the EU due to the international experience of these scientists, the transferable nature of their scientific skills, and their knowledge of EU legislation and requirements. The loss of the opportunity to tender for EU projects may have adverse impacts on employment and profitability within some UK businesses employing highly skilled scientists, whose services are likely to remain in demand within the EU. To ensure that UK companies employing highly skilled scientists can still access business opportunities in the EU, the Government should seek to negotiate continued access for UK companies to tender opportunities within the EU. This will include opportunities published through the Official Journal of the European Union, *Tenders Direct*[9]**.**

5 February 2018

[8] UK Commission for Employment and Skills (2014) The Labour Market Story: The State of UK Skills, Briefing Paper, July 2014.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/344440/The_Labour_Market_Story-_The_State_of_UK_Skills.pdf

[9] http://www.ojeu.eu/