House of Lords Science and Technology Select Committee – The influence of EU membership on UK science inquiry launched

Written evidence submitted by The Institution of Environmental Sciences

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Key points

- The Institution of Environmental Sciences represents professional scientists working across the environmental sector, whose work is significantly shaped and influenced by EU regulations and policies translated into UK law.
- EU funding for interdisciplinary environmental research is vital in maintaining the UK's status as a world leader in scientific research and innovation. The competition and partnerships encouraged by EU grant calls drive ambition and excellence in the UK and other member states.
- The UK is disproportionately successful in securing funding for research projects in the environmental sciences and other sectors due to the strength of our science base.
- The science community should not be defined exclusively in relation to research. Applied environmental scientists recognise the value of policy and regulation at the EU scale in tackling trans-boundary environmental problems, and of the strong environmental regulation the EU produces.

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 community and advocates for environmental science within education. After working closely together for over a decade in 2013 CHES merged with the IES and now serves as its education committee. Together the IES and CHES now accredit over 75 degree programmes in the UK and abroad, including more than 20 Master's courses.

1.3. As a professional association representing scientists working in research, industry and a wide range of other sectors in the UK and internationally, the Institution welcomes the opportunity to give evidence on this issue, as the UK's EU membership is a major influence in the work of many of our members.

Funding for research and innovation

2.1. The IES strongly believes that to deal with the major social, economic and environmental challenges we currently face in the UK and globally, it is vital that the strength of the UK science

base is maintained. It is also vital that 'challenge-focused' or applied science is adequately funded. Particularly given the context of public sector spending constraints domestically in the UK, it is very important to recognise the contribution of EU funding for this type of research. Designed to complement the funding systems of individual members 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 often possible through structures such as the UK Research Councils.

2.2. Social and environmental processes and challenges do not respect disciplinary boundaries, so funding for interdisciplinary research is essential. There are well documented deficiencies in the UK Research Council system regarding the funding of interdisciplinary research, which is often considered high risk. 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"[1].

2.3. As others will demonstrate, the UK based researchers have been very successful in winning European research funding. The UK has a strong track record in winning a disproportionately high level of EU research funding relative to its size. For example, 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 46 projects to UK host institutions[2]. This is a significantly greater number of projects than awarded to institutions in any other Member State, with France the next highest at 25. This success is due to the excellence of UK science.

2.4. Environmental science research in the UK also benefits from significant funding under the EU Framework Programme for Research and Innovation. Under the seventh Framework Programme (FP7) from 2007 to 2013, €1704 million was spent on projects falling under the 'Environment' theme[3]. Of the 4055 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[4].

2.5. Not only does scientific research in the UK benefit from significant financial support from the European Funding Council, the increased competition for funding from the ERC which is a product of the large number of eligible institutions across the EU member states, arguably drives up standards and ambition in research. The significant value of EU research grants, which in the 'Advanced' category (for established researchers with strong track records as field leaders) can

[1] 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

[2] https://erc.europa.eu/projects-and-results/erc-funded-projects?f[0]=sm_field_cordis_project_hi_count%3AUnited%20Kingdom&f[1]=sm_field_cordis_project_subpanel%3APE10

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

[4] 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

be worth up to €2.5 million over five years, and increased collaboration with EU colleagues, serve to enable the ambitious research programmes which this competition encourages.

Collaboration

3.1. For the UK science sector to thrive, we need to be able to attract the best researchers to UK institutes and universities. Free movement of people within the EU is thus very important to the sector, emphasised by the difficulties in acquiring visas for researchers from non-EU countries currently noted by many institutions. To this end, the UK's membership of the EU is an important factor in maintaining our position as a world-leader in science and innovation.

3.2. A major theme in responses to a recent survey of IES members on this topic was the value of partnerships and skill sharing with teams and individuals from other EU member states. It was noted by members that the collaborations facilitated (and often required) by EU research funding programmes tend to generate long-term partnerships.

3.3. For environmental scientists working outside of academia, the free movement of people within the EU is also important, as enables companies to employ the best experts without barriers.

3.4. The Institution of Environmental Sciences is a member of the European Network of Environmental Professionals[5], giving members access to a range of resources and updates on EU policy, as well as a network of professionals from across Europe. Enabling members to engage with the EU policy process, and relevant consultations and debates, as well as groups of professionals in other member states, is very valuable. Although the IES could retain ENEP membership if the UK was not an EU member (ENEP has one Swiss member) which would mean many of the networking opportunities would be maintained, it is unlikely the same level of access to European consortia could be maintained, making the formation of profitable partnerships more challenging.

Innovation

4.1. For innovative companies and research organisations in the environmental sector in the UK, the innovation landscape is very complex. For the very large number of companies involved in the environmental services and water sectors, renewable energy generation and land management, areas of interest to the Institution's membership, support from the UK innovation system has been somewhat inconsistent. Whilst Innovate UK and the Knowledge Transfer Network have provided grant support and engagement activities, their ability to support technological innovation is limited by their size and budget. Even when the financial support from the various Research Councils (NERC and EPSRC in particular) for industry-university partnerships is factored in, the total sums available to support innovation (beyond what companies provide themselves) are dwarfed by funds that are potentially available from the EU, particularly the Horizon 2020 programme. From this financial perspective alone, EU membership is very important to UK organisations, and the UK has performed relatively well to date in winning EU grant support.

4.2. There are nevertheless areas where there is room for improvement. In the water sector, for example, innovation is hampered in part by the lack of explicit UK government support and representation at some of the significant EU committees. Whereas the UK has some winning technologies, and outstanding science, UK organisations are not eligible to bid for some of the

[5] http://www.efaep.org/

funding, and not represented on the bodies that determine the agendas. This makes further progress to the best possible levels very challenging.

4.3. Beyond that, innovation in environmental areas has often reached the position of requiring multinational partnerships to be commercially successful. The EU provides a good platform for these, particularly for small and medium sized enterprises, and for universities, and the UK would be hampered greatly hampered by lack of access to those funded opportunities. As explained above in section 3.3, the Institution of Environmental Sciences supports its Members in their efforts to engage not only with professionals and researchers in other member states, but with European consortia by offering services and networking opportunities through ENEP.

4.4. The UK occupies a very strong position in relation to environmental science research and innovation, and the EU provides a sound basis for further development and commercialization that is not readily matched in the UK.

Regulatory frameworks

5.1. The science community should not be defined exclusively in relation to research. The majority of IES members work in applied science, and a wide range of EU Regulations and Directives shape and affect their work. The work of many environmental scientists in the UK is concerned with the implementation of EU environmental regulation, or in data collection, monitoring or impact assessment associated with it. Important directives include the Water Framework Directive, Air Quality Framework Directive, Birds and Habitats Directives, Environmental Impact Directive, Strategic Environmental Assessment Directive, the Waste Framework Directive, Marine Strategy Framework Directive and many others. Although the provisions of these regulations could be recreated directly in UK law (and have of course in most cases been transposed into the UK statute book), we consider there to be significant advantages to the EU approach.

5.2. The EU has a positive tradition of developing strong environmental regulation, based on consideration of the available scientific evidence. Consequently, the UK's EU membership leads to the translation into UK law of good evidence-based environmental policy. Without this commitment, environmental regulation in the UK could be weakened (a concern voiced by many IES members in a recent survey), thus limiting the ability of environmental scientists to protect the environment. Despite the strong science advice systems in place in the UK, it is also unlikely that the breadth of expertise brought to bear on EU policy by 28 member states could be easily replicated.

5.3. It is clear to environmental scientists that environmental systems rarely reflect political boundaries, and environmental processes and pollutants rarely respect them. As such, regulation and policy developed at EU level is likely to be much more effective in addressing environmental challenges. At this scale, policy makers can take a systems approach to what are essentially transboundary issues.

5.4. As one IES member pointed out in a recent survey, EU environmental regulation such as the big framework directives on water and air quality reflect "bigger visions" based on more strategic and connected science. This "bigger picture" is not currently reflected in UK policy or legislation. On a related note, several IES members also raised the point that as well as regulation and policy, the EU often provides strong leadership on environmental issues, galvanising others to act. Our science is more ambitious, and our environment richer, as a result of this leadership.

5.5. EU leadership is important, but it should also be noted that UK environmental scientists have had significant influence in shaping EU environmental regulation. For example, the Urban Waste Water Directive was strongly shaped by UK science, and staff from the Nature Conservancy

Council were instrumental in the development of the Habitats Directive and Natura 2000 network of protected areas.

Skills

6.1. In addition to the points already raised about the influence of EU regulation, and the value of potential collaborations, to non-academic environmental scientists, EU membership is also important if skills in this sector are to be maintained and improved within the UK. There is a recognised stalling in the development of the skills base in the UK, and transfer of personnel across EU borders is essential in maintaining skills in the sector in light of this trend.

6.2. As already noted, outside of academia environmental scientists work in the public sector, industry, consulting, and NGOs, and for these practitioners much of their work relates to achieving or monitoring environmental standards or requirements written into UK law, but derived from EU directives and policies. As one submission to our survey notes, at the same time, many of the activities and services of these practitioners are increasingly now being applied elsewhere in the world, as environmental standards are globalised (a process in which EU leadership has been important), meaning that: "there is therefore an intimate relationship between environmental policy at sub-UK, UK, EU and global levels and the range of environmental science-based services the UK provides. Hence, EU membership is crucial in driving both requirements for environmental science and for supporting skills development in this major sector".

Science advice

7.1. As reflected in large proportion of EU research funding won by UK scientists relative to other Member States, the UK is a world leader in scientific research and expertise, including environmental science. Given the trans-boundary nature of many environmental challenges, it is in the interest of the UK to feed this expertise effectively in to European Union policy making. We have good track history in the this regard, with Anne Glover being appointed the first Chief Scientific Advisor to the President of the European Commission under Presider Barroso. Although this post has not been maintained under President Juncker, the influence of UK science on EU policy making should not be underestimated. If the UK were to exit the European Union, not only would we lose the ability to politically influence decision making in Europe, UK scientists would be less able to inform the process through formal and informal networks, to the potential detriment of both the UK and EU.

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