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Dear Sirs

Government review of the balance of competences between the United Kingdom and the European Union: call for evidence - research and development

The Engineering Professors' Council (http://epc.ac.uk) represents the majority of academic engineers in the UK, with 77 university members comprising nearly 6,000 academic staff. We are grateful for the opportunity to contribute to this important call for evidence and it is from amongst our members that we have garnered the views and evidence we outline below in response to the questions posed.

IMPACT ON THE NATIONAL INTEREST

1. **Where has EU action had a positive impact for the UK on research, technological development, innovation or space? What evidence is there for this? Has EU action encouraged national action in any areas?**

   EU support for academic research in the UK has been crucial over the past decade: both the provision of funds to support long range research, as well as nearer term research via commercially driven research projects. This has been particularly important since the UK Research Councils have been concentrating their funding strategies on selected "centres of excellence" which means that some important areas have been starved of funding. Indeed, some of our members would go so far as to say that strategic, medium to long term research in industrially relevant processes is basically *only* supported by the EU. Framework programmes have had a significant impact on UK university research, being roughly equal to another Research Council.

   Involvement in EU projects enables UK researchers to collaborate with some of the best researchers in the world, and so enables the UK to punch considerably above its weight. EU initiatives promote significant cross collaboration between academics across Europe, and between industry and academia. Without EU actions there would have to be a significant mechanism to replace it to promote cross country collaboration in technology development and research. It would be hard to imagine replacing it with piecemeal agreements.

   One area in particular where the EU has had a strong positive effect on research is in electronics. With UK business reducing its investment in research and development in this area, UK engagement has had to be with international industrial partners. The record of the Engineering and Physical Sciences Research Council (EPSRC) has been relatively poor in engaging with mainstream electronics (silicon research is currently not supported, for example) and so the EU model of funding consortia involving industrial and academic partners in joint projects where both are on an equal footing has been very welcome. Another

area which has been a significant beneficiary is that of aviation, where EU-funded consortia have been instrumental in keeping Europe and the UK competitive in this field.

2. **Where has EU action had a negative impact for the UK in these fields? What evidence is there for this? Has EU action prevented potentially useful national action in any areas?**

We have few significant examples of the negative impact of EU action in the research and development space but can offer one or two examples of where things can be improved.

Firstly, as for all significant funding sources, it could be argued that It has created clusters of 'grant hunters' in academia and industry with these clusters becoming adept at attracting the lion's share of the money on offer without necessarily demonstrating significant impact.

Secondly, there can be a tendency to force collaboration where it simply isn't necessary and is poor value for money. One example in particular is the EUMINAfab project, whereby efficient use of equipment is promoted through subsidy, provided researchers go to use a piece of equipment in a different country. Thus, a UK researcher may already have a collaboration with a UK university or company, but EUMINAfab will instead fund only going to a facility in Germany or Italy for example.

Thirdly, it is suggested that there might be better co-ordination between the UK Research Councils and the Framework programmes – we address this further below.

3. **How and where has UK engagement with partner countries or international bodies, both within and outside the EU, been helped or hindered by EU involvement?**
By allowing researchers across continental Europe to work together easily, EU funding has enabled UK researchers, and European colleagues to influence various international standards bodies in terms of technology development. That said, engagement with the US and Japan is hindered because of barriers to funding within EU Framework. It's a simple obstacle, but potentially very damaging across some major fields of research.

4. **What benefits or difficulties has the objective of a European research area (ERA) delivered for the UK?**
Research is, by its very nature, an international activity. But in practical terms, if a researcher wishes to collaborate on a project, he or she will simply seek out the best in the field, regardless of nationality, thus, the ERA has probably had little impact. One key advantage, though, from the UK regional perspective is the reduction of emphasis on research institutions in the "Golden Triangle" around the capital when developing policy.

5. **How has the EU sought to coordinate the policy instruments at its disposal across different policy areas to create an enabling environment for researchers and innovators? How successful has this been?**

The objective of driving international collaborations is a powerful way to add "hybrid vigour" to UK research. The availability of substantial funding is a powerful driver of behaviour and the provision of fora for the establishment of priorities and to identify partners is very useful. That said, co-ordination in a large organisation like the EU, which has to balance competing interests, is often exceedingly slow. But it feels as if co-ordination has improved over the last ten years and there are signs that the Horizon 2020 programme will try to address some of the known weaknesses. As mentioned above, one area to avoid is erecting barriers to collaboration within individual countries and with countries outside the EU.

There are a number of important initiatives for promoting cross collaborations, including a number of instruments such as Marie Curie initiatives, and a whole range of other international network measures.

They are good but insufficiently flexible. Ideally proposals should be welcomed from any number of researchers within various countries, rather than only from a large number of participants. In addition, many of the networks only pay for people, rather than the full cost of research.

FUTURE OPPORTUNITIES AND CHALLENGES

6. **What could the EU most helpfully do to promote scientific and technological progress and innovation (including in the space sector)?- How could the EU use its existing competence differently to deliver more in your area?- How might a greater or lesser degree of EU competence deliver more in your area? - How could improvements to existing EU activities make them more effective and efficient?**
   As mentioned above, we would recommend that:
   - Restrictive practices simply aimed at promoting integration should be removed.
   - Collaboration should be allowed between any number of researchers, and responsive mode proposals across countries, so long as they are excellent.
   - Funding not only people but also other costs of research is essential.

   It also seems that a large proportion of EU research money tends to be awarded to large corporates and supporting basic research in universities with provision of more support for smaller companies wishing to innovate would be welcome. Funding of basic research and start-up companies is more likely to produce big "game changing" economic benefits, albeit at a higher risk.

   We would also emphasise that failure to maintain the national research base will make it harder to engage productively with EU projects: the need for national funding to maintain excellence in basic science is clear.

7. **Where might future EU level action be detrimental to your work in this area?**
   Maintenance of the current levels of funding is essential: reductions in EU funding, alongside the national funding reductions would be extremely detrimental. In addition, any action that makes it difficult to fund collaborative projects with researchers in US, Canada and Japan would be a serious problem.

8. **Where might action at national rather than EU level be more appropriate / effective?**
   As stated above, we re-iterate that failure to maintain the national research base to maintain excellence will make it harder to engage productively with EU projects. Funding of capabilities should be accomplished at the national level. Early stage work, in which deliverables are less certain of being achieved, is properly the job of the national Research Councils which at least attempt to require funding recipients to articulate the impact of what they do (EU Framework appears less successful at this). While we now have an emerging industrial strategy in the UK, the historic lack of one, coupled with the artificial split between Research Council and HEFCE quality-related funding has often made the EU route more attractive for industrially relevant research.

   An important national policy which is impacting UK research and development detrimentally is the current administration's approach to immigration. In a poll of Engineering Professors' Council members in April 2013, 44% of those participating reported difficulties with recruitment of non EU staff with almost all of the respondents who reported difficulties indicating that the posts remain unfilled. As one participant put it "*the rules are inflexible and not appropriate for staff on the sort of short-term contracts or work exchanges that are essential to research programmes and are often at odds with the requirements of cross-border research grants: the sort of grants in which the Government encourages academics to participate*." As indicated above, research is by its very nature, an international activity and Government policies need to be "joined up" to facilitate this.

9. How could EU and national policies and funding streams interact better?

We would re-iterate that a healthy national research ecosystem tends to be founded on a well-funded base of research across the whole of science rather than imposing "top down" research themes and an attempt to "pick winners". The interaction is best when the national strand does its job well so there is something with which EU partners wish to collaborate.

For example, the lack of UK funding for UK industry based research in turn impacts on the performance of UK companies in EU programmes and hence the connectivity between UK industry and academia in research.

10. What impact would any future enlargement of the EU have on this area of competence?

While we would welcome additional potential partners: different national science styles are all valuable and complementary, dilution of funding would need to be guarded against. New members would need to meet the same criterion of excellence as existing members.

We would be delighted to meet to elaborate our responses further if required.

Yours sincerely

Professor Simon Hodgson

President