

# Government Review of the Balance of Competences between the United Kingdom and the European Union

## Joint National Academies Submission to the Department of Business, Innovation & Skills Call for Evidence on Research and Development

### Summary

1. The UK's national academies – the Academy of Medical Sciences, the British Academy, the Royal Academy of Engineering, and the Royal Society – welcome the opportunity to submit evidence to the government's review of the balance of competences between the United Kingdom and the European Union in relation to research and development.
2. We believe that the current system of shared competences between the United Kingdom and the European Union does not require fundamental change, and creates significant positive benefit overall for UK researchers and institutions that could not be achieved outside the European Union. Protocol No. 25 on Shared Competences makes it clear that the existence of EU policies on research does not constrain the freedom of national research policies.
3. The European Union has not only provided significant and vital funding to the UK for research and innovation, complementing the UK's funding landscape for research (from public, private and philanthropic sources), but has also created and amplified opportunities for international collaboration and has increased the reputation, competitiveness and attractiveness of the UK as a centre of global excellence in research and innovation. National systems that become isolated from the stream of global knowledge exchange lose their vigour and excellence. Working at a European Union level is a vital element of this and adds value to the UK's own national effort to promote and enrich its research base and research excellence, and to leverage its innovative capacity.

### European Union Research Funding

4. In purely financial terms, the UK's performance in obtaining European research and innovation funding has been excellent. The UK has participated in 12.9% of all Framework Programme 7 (FP7) grants and has received 15.1% of the grants value, which is more than any other country except Germany. Furthermore, the UK has received 22% of all funding granted by the European Research Council (ERC), which is more than any other Member State.<sup>1</sup> Proportionally, these are both far higher than the UK's contribution to the EU budget, at roughly 11.5%, and the UK's share of overall EU spending, at around 5.6%.<sup>2</sup> The UK's success in leveraging EU funding is apparent in several fields of research that are key

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<sup>1</sup> Communication with UK Research Office in Brussels, 1 August 2013

<sup>2</sup> Fifth FP7 monitoring report, EU Budget Financial Report 2011.

national interests, including social science, engineering and biomedical science (for example, the UK is the top recipient of investment in health research amongst Member States with over 19% of FP7 funding in this area to date).<sup>3</sup>

5. EU funding provides essential research support and mitigates the impact of domestic fiscal constraints by diversifying the UK's research funding. Additionally, the EU's seven year funding cycle through the Multiannual Financial Framework provides a more predictable and longer term source of funding than at national level. Participation in EU programmes has also historically performed a capacity building function, providing seed funding to develop research expertise in areas where the UK has later won a reputation for global excellence (e.g. research into the impacts of climate change — see the case study in paragraph 31). Additionally, it has facilitated the development of UK excellence in capital-intensive research areas such as particle physics, for which international collaboration, access to expensive infrastructure, and a critical mass of funding is required. In some areas, EU funding has provided the basis for increased public-private sector collaboration in the UK (see the case study on the Innovative Medicines Initiative (IMI) in paragraph 29).
6. Participation in EU Framework Programmes has enriched the talent pool for UK research, particularly through Marie Skłodowska-Curie Actions, which has attracted top talent to the UK and allowed UK researchers to engage in a larger interdisciplinary research community. Moreover, it has allowed these researchers to access facilities unavailable in the UK, expanding the scope of UK research. Under FP7, the UK has won 2,743 Marie Skłodowska-Curie Action grants, up to the start of March 2013, with a value of €717,109,150. This represents 18% of all such grants in FP7.<sup>4</sup> We thus very much welcome the increase in funding that the government helped to secure for the Marie Skłodowska-Curie Actions under Horizon 2020.
7. Participation in EU programmes has clear attractions for research-intensive businesses in the UK, providing opportunities to perform research at scale, address very large or multidisciplinary challenges, and carry out joint research activity that involves co-ordination with customers, suppliers, or competitors across multiple countries in the single market. Some of the UK's largest technology companies, including Rolls Royce, BT, QinetiQ and BAE Systems, are regular participants in European programmes and platforms, while many SMEs have used participation in Framework Programmes to develop products, build networks, and explore potential markets. Many European standards, elaborated through EU research programmes, have been adopted internationally, giving participating companies an edge in accessing global markets (see the case study in paragraph 26).
8. The introduction of EU legislation and regulation across the 28 Member States can also help to foster cross-border collaborations by harmonising the procedures under which research is conducted. For example, the Clinical Trials Directive included the aims of harmonising the standards of trials in the EU, facilitating multi-centre collaborations and promoting multi-national trials, although there were difficulties with its implementation in practice (see the case study in paragraph 28). Directives and Regulations can

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<sup>3</sup> Unpublished data from the Medical Research Council

<sup>4</sup> Communication with UK Research Office in Brussels, 1 August 2013

help to improve and harmonise research conduct across the EU as long as they are carefully designed so as not to be unnecessarily prohibitive for research.

### Research Excellence and Research Collaboration: The United Kingdom and the European Union

9. The latest FP7 Monitoring Report from 2011 highlights the UK's success in gaining EU research funding in general. Among higher education institutions, the three highest achieving in terms of the number of researchers involved in projects are from the UK (Cambridge, Oxford and Imperial College) with a further 11 UK institutions appearing in the top 50. Overall, UK researchers participate in 12.9% of all FP7 grants and receive 15.1% of the grants value.<sup>5</sup>
10. Business participation in FP7 lags behind that of our main European partners; income from FP7 drawn down by UK industry is roughly 62% of that achieved by German industry. UK business participants tend to cluster in smaller, niche themes (including Space, Research for SMEs, Research Infrastructures), while far lower levels of UK business participation are to be found in larger, better-funded themes (including Energy, Environment and ICT). Greater strategic co-ordination of the UK's approach to EU research and innovation funding programmes, including better promotion and support networks for business, and synergies between national and European programmes will ensure the UK is even better placed to build upon and leverage its excellent performance.
11. In terms of the European Research Council (ERC), however, the UK receives the most funding by far, as stated above in paragraph 4, and when combined with the Marie-Sklodowska Curie Actions they represent an aggregate grant value of 38% of the UK's FP7 grants value overall.<sup>6</sup> From the ERC, the UK-based research has been awarded, up to the start of March 2013, 841 grants with a total value of €1,166,329,224.<sup>7</sup> It is worth noting that the ERC operates on the basis of peer-reviewed assessment criteria, allocating funding solely on the basis of excellence of individual applicants. In all three fields that ERC data are available for – the physical sciences and engineering, the life sciences, and the social sciences and humanities – UK-based researchers gain more grants than in any other country. Such UK leadership is a significant mark of excellence and prestige that has important global ramifications for the position of UK researchers and the UK as a destination and thriving community for research.
12. The UK is particularly strong in the number of grants gained in the social sciences and humanities (see the case studies in paragraphs 23 and 24). For ERC Start-up Grants provided from 2007-12, the UK has been awarded 125 of 389 grants in total, or 32.1%, which is more than Germany, France and Netherlands combined and those three excepted is more than all other EU Member States combined.<sup>8</sup> For ERC Advanced Grants provided from 2008-12, the UK has been awarded 81 grants in the social sciences and humanities out of 258 in total (or 31.4%). This is again more than France and Germany combined.<sup>9</sup> This

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<sup>5</sup> Communication with UK Research Office in Brussels, 1 August 2013

<sup>6</sup> Communication with UK Research Office in Brussels, 1 August 2013

<sup>7</sup> Communication with UK Research Office in Brussels, 1 August 2013

<sup>8</sup> Statistics from ERC's website <http://erc.europa.eu/statistics-o> on 6 August 2013

<sup>9</sup> Statistics from ERC's website <http://erc.europa.eu/statistics-o> on 6 August 2013

success recognises the strength of the UK in terms of the social sciences and humanities and enables the UK to be a leader in this field of research.

13. UK researchers have also achieved prominence in European Cooperation in Science and Technology (COST) actions, where the UK participates in more actions than any other country (300 out of 301).<sup>10</sup> The UK is also very active in leading COST actions. This highlights that the platform for collaborative research that the European Union provides is invaluable. It provides a ready basis for international collaboration and means that the UK's position and voice in research and innovation on a global scale are enhanced.
14. Research infrastructures are another area of conspicuous UK strength, with the UK participating in 11.8% of the grants and receiving 17% of the grants value.<sup>11</sup> The platform for collaboration in research that the European Union provides also helps drive interdisciplinary and multidisciplinary research as well as promoting longitudinal comparative data-gathering, as notably in the European Social Survey, led by UK-based researchers (see the case study in paragraph 21).<sup>12</sup> The interaction of researchers from different national traditions and cultures enriches an understanding of the research questions facing contemporary states and the potential for research activity. For example, the different mix of ethnic and religious groups within the different European countries brings a diverse set of perspectives to bear in identifying the key issues in cultural diversity and the impact of migration. The interdisciplinary and challenge-driven approach of Horizon 2020 is another welcome step down this path, although close scrutiny will be required to ensure the aims of this approach are realised.

### Future Challenges and Opportunities

15. It is important that UK research has a stable funding outlook for the long-term, which membership of the European Union provides, in order to enable UK-based researchers and UK institutions to deliver research excellence and attract excellent researchers to the UK.
16. Horizon 2020 is an ambitious attempt to move EU research and innovation funding to a challenge-based approach. This, if delivered well, will have many benefits in driving interdisciplinary and joined-up research. However, if implemented poorly or not at all, it may well mean that some disciplines, notably the social sciences and humanities, lose out to more prominent and better-connected research interests. The UK was successful in the negotiations on Horizon 2020 in supporting, and extending funding for, the ERC and the Marie Skłodowska-Curie Actions despite a difficult financial climate. A further emphasis on supporting these two critical programmes would be most welcome in future negotiations as well.
17. More also needs to be done to promote better integration of research and innovation strands across all EU Funding Programmes, with greater emphasis given to downstream innovation. Consideration should be given to additional support for the development of products and processes arising from the results of EU

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<sup>10</sup> COST Overview, July 2013 [http://www.cost.eu/about\\_cost/how\\_cost\\_works](http://www.cost.eu/about_cost/how_cost_works)

<sup>11</sup> Communication with UK Research Office in Brussels, 1 August 2013

<sup>12</sup> <http://www.bbc.co.uk/news/science-environment-17149897>, <http://www.cam.ac.uk/research/news/piety-in-the-renaissance-home>, <http://erc.europa.eu/erc-stories/united-diversity-how-live-difference-europe>

funded research, including specific pump-priming funding for businesses. In keeping with the broader strategic goal of increasing Europe's innovative capacity and driving jobs and growth across all Member States, more attention needs to be paid to capturing and tracking the social and economic impact of EU-funded applied research projects; this is an area where the UK could provide leadership.

18. In some instances, Regulation and Directives that become UK law can occasionally impose unnecessary constraints on the conduct of research. For example, the introduction of the Clinical Trials Directive created an administrative burden and increased cost for initiating new clinical trials in EU countries and a downturn in the number of trials initiated since 2004 (see the case study in paragraph 28). More general EU legislation can also have an impact on, and potentially constrain, the conduct of research in the UK. For example, proposed amendments to articles of the draft General Data Protection Regulation that are being discussed in the European Parliament would prevent the use of personal data in epidemiological research and in recruitment for clinical studies (see the case study in paragraph 30). Both examples above illustrate the need for Government and UK stakeholder groups to maximise their engagement with all the European Institutions to ensure that new legislation delivers favourable outcomes with minimal risk of unforeseen dependencies.
19. National engagement on EU matters can be complemented by enhanced engagement with EU institutions at EU level. The UK national academies are active members of representative organisations which co-ordinate and promote members' positions on critical research and technology policy issues, such as the All European Academies (ALLEA), the European Academies Science Advisory Council (EASAC), the European Council of Academies of Applied Sciences, Technologies and Engineering (Euro-CASE) and the Federation of European Academies of Medicine (FEAM). These links enhance the UK's influence in the EU.
20. The reputation of UK research is enhanced through membership of the EU. The UK's success in prestigious European research programmes provides a basis for the UK's leading role in global research and innovation and as one of the top countries that encourages the best research in the world. This reputation should be preserved and cultivated to develop further the UK's research base so it continues to be a leading player in an increasingly competitive global market.

## Appendix: Case Studies

### 21. *European Social Survey (ESS)*

The ESS is widely used by academics, researchers, policymakers and journalists as an authoritative source of longitudinal data about Europe's evolving social, political and moral fabric. Every two years the survey charts Europe's social structure, conditions and attitudes and interprets how this is changing in such fields as moral and social values, health and well-being, trust in institutions, education and occupation, household circumstances, social exclusion, citizenship, immigration and crime. This enables governments, policymakers and researchers to have up-to-date information on how people perceive their lives, nations and the world. During our current time of economic and political difficulty such reliable data are more important than ever.<sup>13</sup> That the United Kingdom has been at the forefront of leading the ESS has been crucial in creating one of few social science European research infrastructures, which, thanks to the widespread collaboration across Europe, provides a EU platform which is a major success for UK research and UK institutions and research councils.

### 22. *Economic Change, Quality of Life and Social Cohesion (EQUALSOC) Network*

EQUALSOC gained funding under Framework Programme 6 and has been running from 2005-2013. It has proved an important resource for UK researchers and students in developing quantitative skills among social scientists through dedicated methods workshops on data analysis techniques for longitudinal research, individual visitorship programmes, summer schools, thematic workshops and conferences. EQUALSOC has thus provided an infrastructure for training the rising generations of young researchers across Europe with key skills that they would otherwise not have received.

### 23. *YouCitizen*<sup>14</sup>

YouCitizen is an Advanced Researcher Grant from the European Research Council of five years duration that is looking to provide a comparative, multi-level ethnographic research project examining international efforts to foster citizenship among youth in divided societies. The research is led from the University of Durham in collaboration with the Universities of Sheffield and Cambridge. The ERC grant is particularly valuable in providing significant funding for interdisciplinary and cross-institutional research, which enables the research team the time to develop substantive comparative research across diverse institutional and geographical settings. For those UK-based researchers involved in the project it helps to develop early career researchers through mentoring with the Principal Investigator, whilst continuing to provide the opportunity to develop their teaching and administrative capacities.

### 24. *Do Forecasts Matter? Early Warnings and the Prevention of Armed Conflicts (FORESIGHT)*

This ERC Starting Grant was awarded to Professor Christoph Meyer based at King's College London in 2007 and led to his successful bid for an ERC Proof of Concept in 2012. Professor Meyer's project was one of the first ERC grants to be completed and led him to describe ERC funding as "a tremendous opportunity, almost a scientific nirvana, which allowed me to devote more time to research and to build an interdisciplinary team that enabled me to realise the project".<sup>15</sup> Such ERC grants are thus providing unique

<sup>13</sup> [http://www.europeansocialsurvey.org/index.php?option=com\\_content&view=article&id=372:findings2&catid=22:news&Itemid=48](http://www.europeansocialsurvey.org/index.php?option=com_content&view=article&id=372:findings2&catid=22:news&Itemid=48)

<sup>14</sup> <http://www.dur.ac.uk/geography/research/youcitizen/>

<sup>15</sup> <http://erc.europa.eu/success-stories/how-research-helps-prevent-armed-conflicts>

opportunities for UK-based researchers to lead in their fields in cutting-edge areas of research that have particular policy relevance – in this case in helping to forecast and perhaps prevent conflict.

#### 25. *Space*

The EU's user-led major space programmes, Galileo and GMES (Copernicus) have created significant commercial opportunities which the UK has exploited. On Galileo, as part of the procurement by ESA, Surrey Satellite Technologies Ltd (SSTL) is building the navigation payloads for the first 22 fully operational satellites. Other UK industry is building ground systems, while the National Nuclear Laboratory has received significant ESA funding to develop nuclear batteries for future spacecraft, using americium extracted from UK civil plutonium stock-. On GMES, SSTL and Astrium have major roles developing the Sentinel-5 precursor satellite mission, which will launch in 2015 to monitor the composition of the earth's atmosphere.

#### 26. *EU Research - Global Standards*

European research programmes have given UK companies the opportunity to help draw up standards that later become widely adopted in Europe and internationally. The DAB standard for digital audio broadcasting was developed as a research project under the Eureka programme, while the 3G UMTS standard emerged from the FP4 Project *Frames*. The global reach of GSM, a 2G standard developed in the 1980s by officials from Germany, Italy, France and the UK which at its peak in the early 2000s accounted for 80% of the world's mobile phones, highlights the enormous market benefits which can be obtained from research and standardisation co-ordination at a European level.

#### 27. *FilmLight - an SME success story*

FilmLight, a UK film industry SME, financed the research and development of its key product range, Baselight, through participation in two Framework Programme projects- Speed FX in FP5 and IP-RACINE in FP6. Baselight is now the industry standard colour conversion platform, used in over 50 countries, and most recently deployed in the 3D blockbuster *Pacific Rim*. In the case of FilmLight, EU research funding provided a source of patient capital, coupled with access to sociological research and market intelligence from academic partners across Europe.

#### 28. *The EU Clinical Trials Directive*

The 2001 Clinical Trials Directive was implemented in 2004 with the aims of harmonising authorisation procedures on clinical trials on medicinal products and improving the generation of reliable patient data.<sup>16</sup> This has led to success in some instances, particularly for multi-national trials requiring the pooling of small numbers of patients with rare conditions in each nation. However, the Directive has substantially increased the administrative burden and costs of initiating new trials. These factors resulted in the EU being a less attractive environment in which to establish clinical trials (particularly for academia), and there has been an overall decrease in the number of trials being initiated in the EU since 2004. This has affected innovation for therapeutic care and economic development in the EU.<sup>17</sup> The draft Clinical Trials Regulation currently being discussed in the European Parliament appears to address many of the

<sup>16</sup> <http://ec.europa.eu/health/human-use/clinical-trials/#geninf>

<sup>17</sup> Fears R et al. (2013). *Reforming the EU environment for clinical trials: what are the challenges?* Q J Med doi:10.1093/qjmed/hct149

shortfalls introduced by the Directive, by streamlining the trial authorisation process, simplifying monitoring requirements, addressing sponsorship issues, introducing a risk-adapted approach, and providing detailed guidance to decrease variability of the Directive's legislation across Member States. However, continued engagement is required with the European Institutions and UK stakeholders to ensure this outcome.

### 29. *The Innovative Medicines Initiative*

The IMI is a collaborative venture between the European Commission, European pharmaceutical companies, regulators, academia and patient organisations.<sup>18</sup> Teams with representatives from each sector have pooled data and knowledge to tackle challenges to pre-competitive drug research and development. The primary aims are to 'reinvigorate the European pharmaceutical industry and biopharmaceutical research, and to improve the health of patients' by finding solutions to some of the challenges which hold up the search for new medicines. It will allocate a total of €2bn over 10 years, having commenced in 2008. 23 projects are underway in a diverse range of areas including projects addressing schizophrenia, rheumatoid arthritis, asthma, electronic health records and simulation tools. While these are highly collaborative ventures, UK organisations have had a central or prominent role in many, such as GlaxoSmithKline's lead position in the ABIRISK project.<sup>19</sup> Approximately 30% of IMI funds have been awarded to UK organisations to date.<sup>20</sup> The IMI will be renewed through Horizon 2020 as part of a €22bn Innovation Investment Package, and the UK is in a prime position to take advantage of this.

### 30. *The EU General Data Protection Regulation*

In January 2012, the European Commission published a proposed General Data Protection Regulation (DPR), which would replace the existing Data Protection Directive.<sup>21</sup> The Regulation will govern the collection and use of personal data of EU citizens across all sectors except from criminal justice. The draft DPR provides a number of exemptions from specific requirements when data would be processed for historical, statistical or scientific research purposes. When processed in accordance with a set of safeguards (described in Article 83), a data subject's consent would not be required for each research study using personal data, which would facilitate the use of personal data in research. However, while the draft DPR has been under consideration by the European Parliament, several proposed amendments would mean that health data could be used only for research with the "specific, informed and explicit" consent of data subjects.<sup>22</sup> If approved, these amendments would be highly problematic for the conduct of epidemiological research, which often relies on broad consent of subjects to provide pseudonymised data for several research studies (for example, as part of large cohort studies). The amendments would also prevent researchers from being able to identify participants to take part in studies or clinical trials based on identifiable information that would indicate whether they were suitable candidates for inclusion. The UK government, UK stakeholders and UK MEPs have been working intensively to prevent this.

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<sup>18</sup> <http://www.imi.europa.eu/>

<sup>19</sup> <http://www.abirisk.eu/index.html>

<sup>20</sup> Unpublished data from the Medical Research Council

<sup>21</sup> The European Commission (2012). *General Data Protection Regulation*. [http://ec.europa.eu/justice/data-protection/document/review2012/com\\_2012\\_11\\_en.pdf](http://ec.europa.eu/justice/data-protection/document/review2012/com_2012_11_en.pdf)

<sup>22</sup> The European Parliament (2013). *Draft report on the proposal for General Data Protection Regulation*. [http://www.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2012/0011\(COD\)](http://www.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2012/0011(COD))



### 31. *Climate Change Impacts Research*

European research programmes have enabled the UK to become a global leader in the academic study of climate change impacts. Programmes such as Groundwater Resources and Climate Change Effects (GRACE) and Production of Precipitation Scenarios for Impact Assessment of Climate Change in Europe (POPSICLE), both pursued by the University of Newcastle with funding from the Third Framework Programme (1990-1994), gave UK researchers early opportunities to build research excellence and forge strong links with European partners. The networks and research capacity engendered by this early EU funding have helped UK researchers secure further EU funding, produce cutting-edge research, and establish the UK as an internationally recognised leader in this field.