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Centre for Process Innovation

CATAPULT
High Value Manufacturing

Review of UK and EU balance of competences: call for evidence on research and development



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?

There are four major funding streams administered by the European Commission that have helped to create value in research, development and innovation. These are: European Regional Development Fund (ERDF), EU Framework Programme Seven (FP7), Competitiveness and Innovation Programme (CIP) and Joint European Resources for Micro to Medium Enterprises (JEREMIE).

- ERDF has helped to establish and build a number of important new research and development facilities in the UK, in locations that require a boost to their local economy. Examples of facilities include; the National Printed Electronics Centre in County Durham; the Innovation Accelerator at Wilton, Redcar (an incubator for high-tech start-ups and small businesses operating in the Process Sector); and NETPark, a science and technology business park in County Durham. ERDF has hence provided an essential source of capital and revenue finance for building and developing new state-of-the-art infrastructure for research and innovation. A number of the facilities established via ERDF, or which have benefited from ERDF, now form part of the High Value Manufacturing Catapult across the UK.
- EU Framework Programme Seven (FP7) has provided access to finance, for many businesses and research bases for co-funding large multi-partner projects. EU Framework Programme remains one the very few sources of funds that can be accessed by businesses to fund international research projects, or indeed large-scale R&D projects. Similar levels of grant funding (£3M+) are not available from government sources in the UK for business to investing in cutting edge research and development. The UK has recently introduced the Regional Growth Fund and the Advanced Manufacturing Supply Chain Initiatives - these funds target near to market opportunities and supply chain strengthening. UK Research Council funds cannot be directly accessed by businesses. Funds for research and development from the Technology Strategy Board, tends to be for smaller research projects (far less than £3M). The Centre for Process Innovation (CPI) and a number of CPI's industrial clients have benefited from FP7 projects in building and testing new technologies, prototypes and pilot-lines. It has also helped to strengthen research and innovation capacities within participating organisations.
- The Competitiveness and Innovation Programme (CIP) has helped our clients, who to assessed funds from Eco-Innovation for the development and first implementation of their environmentally friendly technology, which in turn has helped enable further replication or industrial adoption. The Competitiveness and Innovation Programme (CIP) to date has provides the only grant finance source that directly helps the commercialisation of new demonstrated technologies/products that face a challenge in their initial adoption. Example: A client of the Centre for Process Innovation (CPI) successfully secured finance from Eco-Innovation. This has helped the company, a local SME, to establish a small-scale production facility in the region for manufacturing construction materials made from recycled waste.

The Competitiveness and Innovation Programme (CIP) also co-funded the formation and operation of the Enterprise Europe Network (EEN) in North East England, alongside other EEN Hubs in the UK. This has enabled us to provide

face-to-face sustained business support services to local SMEs, including assistance for making EU applications. EEN also provided access to the EU's Technology and Business Partnering Database, for partner searching and new business development.

- JEREMIE funds from the European Investment Bank, matched by ERDF funds, have been established in certain locations in the UK to provide equity finance to SMEs, in particular for Proof of Concept and Co-Investment. This has helped start-ups and small businesses to access finance to aid commercialisation. There are similar schemes in the UK such as finance from NESTA. JEREMIE in the UK has been implemented with matching ERDF funds, thereby targeting growth through innovation in areas of the UK where the economy needs further assistance, if it is to expand. Here it has helped business leaders to take greater risk – helping to overcome the very high risks involved in the commercialisation of new and early-stage technologies. JEREMIE offers a route for financing the commercialisation of research outcomes of both nationally funded and European projects. JEREMIE funds are well marketed/resourced in the UK compared to other financial support arrangements. In North East of England, the funds are administered by NE Finance. Centre for Process Innovation (CPI) start-ups and clients of CPI have benefited from these funds.
- The availability of ERDF, FP7, CIP and JEREMIE funds has encouraged action in the UK, in the form of local government bodies initiating new projects, services and initiatives at local level, by drawing upon the finance accessible.

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?

It is difficult to gauge if any individual EU action has had a negative impact, however there is likely to be a negative opportunity cost (UK money is given to Brussels for allocation and administration rather than directly to fund UK R&D). This forms part of a broader EU debate and is beyond the scope of this response.

One specific area that the EU needs to address is the complexity involved in the administration of EU funds and EU projects. ERDF, for example, is a complex finance source and the basic administration cost of ERDF projects to ensure compliance is high – especially revenue intensive projects. This aspect of ERDF has hindered project outcomes and/or even deterred potential applicants. Threat of funding 'claw back' is a key feature in the ERDF debate with existing and new applicants. In ERDF changes in finance rules are retrospectively applied increasing risk.

A lack of clarity in the method of contributing to FP7 calls for proposals has created an impression of a closed 'members club'. No formal mechanism or routes appeared to have existed prior to the creation of the European Technology Platforms (such as Photonics21). These platforms have provided more visible routes to discussing, contributing and influencing call text.

The draft call text that is distributed by the European Commission (EC) also needs to be better managed. Once it is released to "confidentially to advisors", in many EU Member States the draft call text is simply distributed further and hence it becomes more readily available in those countries. In the UK the draft call text is not distributed as widely. This creates a competitive disadvantage for UK businesses and has hindered participation of UK businesses in FP7. Also, some thematic areas of FP7 also released their draft call text earlier than others. A clear, transparent, consistent and more open policy needs to be adopted by the European Commission (EC) in the

distribution of the draft call text for calls opening under Horizon 2020 to ensure fairness and encourage greater participation by industry, including SMEs.

There is a multitude of funding schemes administered by the European Commission – a very complex landscape that many organisations find difficult to fully understand. This may have hindered or prevented some UK businesses in trying to access the available funds. There is a need for the European Commission (EC) to consider releasing call for proposals from a single online portal. The European Commission (EC) already has started to make some progress towards this following the implementation of the Research Participant Portal.

The EU practice of funding calls requiring partners from specific geographic areas (e.g. must have a partner from country X or region Y) may have had a negative impact by a) deterring potentially good projects unable to find a partner from that country or region, and b) leading to weaker project consortia, inviting partners simply to satisfy the geographical requirements in a diluted role.

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?

We have no specific example. However, research and innovation demands international collaboration. Through its funding schemes such as FP7, EUREKA, ERANETS and Eurostars the Commission does help to enable international research and development projects to be funded and hence established. The European Technology Platforms have also provided a vehicle within which organisations from different countries have engaged to help define and contribute to the strategic research agenda in different sectors and technological arenas.

4. What benefits or difficulties has the objective of a European Research Area (ERA) delivered for the UK?

The overall benefit to the UK of the European Research Area is significant. It has allowed research bases and industry across Europe to collaborate on projects, exchange staff and develop early-stage researchers. It has encouraged mobility for researchers to develop careers in Europe.

However, the UK still suffers from difficulties in developing, attracting and retaining highly qualified researchers. The objectives of a European Research Area have been more beneficial to UK universities than to UK businesses, especially small companies. There is a need for the UK to look at policies and strategies that will help develop and retain expertise in the UK, incentivising the movement of skilled people from academia to industry. Whilst the creation of European Research Area could assist as it enables UK organisations to hire researchers from other EU and EU associated countries, the UK needs to invest in research facilities that are increasingly accessible to industry and for the resulting innovation to benefit the UK through economic growth. This will help build, attract and retain the right professionals.

One of the instruments that is aimed at developing a European Research Area is ERANETs. While in principle the proposed use of ERANETs is a mechanism to extend cooperation at the EU level is attractive, in practice alignment of national priorities and funding rules is problematic. The current ERANET application structure of national followed by EU level assessment means that the investment of significant resources is required in the first phase without the assurance of the agreed protocols and robust guidance for applicants provided for FP7 CR&D calls. Therefore the proposed extended

use of the ERANET mechanism under Horizon 2020 raises concern for the UK R&D Community, especially for smaller organisations.

ENIAC KET actions also enable creation of key facilities which could be located in the UK.

COST is another EU funding source that can help networking and connection of national level projects across Europe. It is however, not well promoted in the UK.

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 EU has many policies, associated programmes and funding streams at its disposal including to date: FP7, CIP, ERDF, Life+, Eurostars, JTI, JEREMIE funds, COST and EUREKA. There are likely to be other sources. The EU has also encouraged EU Member States to stimulate the demand side of innovation via public sector sub-contracts. In the UK this has led to the successful Small Business Research Initiatives (SBRIs) calls for proposals.

The aims and objectives of each of these instruments are positive. The approach taken by the European Commission is for the different programmes to be coordinated by different Directorate-General and Executive Agencies. This approach has led to fragmentation making it difficult for individuals and organisations to understand and hence to participate. The European Commission needs to look at reducing fragmentation, for example by:

- Ensuring information on the different funding sources is accessible from a single location. Horizon 2020 is also integrating some of the different funding sources. This too will be helpful.
- Calls for Proposals to be issued from a single point. The introduction of the Research Participant Portal is a good step towards this.
- Reducing complexity of administration rules, for both applications and subsequent management. Finance rules can vary significantly between instruments because of the Directorate-General and Executive Agencies. The Commission should look at harmonising finance rules between different instruments rather than having different rules. The finance rules for what can be claimed on ERDF for example is very different to those applied in FP7. The finance rules used in CIP projects are again different to those used on FP7. DG Research and Innovation appear to have the most mature system and experience.
- Improve how draft call text is distributed. Rather than limiting the distribution to a few stakeholders, it should be made available early to all.

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)?

a. How could the EU use its existing competence differently to deliver more in your area?

The EU could enhance its existing competences by reducing fragmentation in a number of areas:

- Ensure all the call for proposals are located in one online system rather than many online locations
- Harmonise the various support services offered by the Commission such as the IPR Helpdesk, Finance Helpdesk, National Contact Points and Enterprise Europe Network.

Further ways the EU could use its existing competences to deliver more include:

- Identify better ways of enabling businesses to participate in programmes and access funds. For example ensuring the Enterprise Europe Network interfaces with SMEs at a local level and supports businesses to directly access EU programmes.
- The European Technology Platforms have provided a vehicle for businesses to business needs and joint contribute to EU programmes and actions. However, greater steps are needed to help businesses to engage in the process of contribution and participation in EU programmes such as Horizon 2020.
- Innovation is at its strongest when different disciplines and market sectors are able to engage and collaborate, transferring knowledge and products between sectors. The more extensive use of challenge led, rather than specific technology directed, competitions would actively promote such opportunities for wider collaboration.

b. How might a greater or lesser degree of EU competence deliver more in your area?

When it comes to research and development, the Commission should place more emphasis on industrially led projects to optimise the adoption and hence economic impact of the work funded. Innovation in the mid to late stages of industrialisation is likely to be further from the scientific state of the art found in early stage academic studies. Therefore reduction in emphasis on scientific 'world's best', and a new emphasis on objectives more relevant to commercialisation (higher yield, more reliable, lower cost i.e. process economics) would create economic impact in our area.

The Commission should consider having instruments that could help start-ups and small businesses to commercialise outcomes.

c. How could improvements to existing EU activities make them more effective and efficient?

This has been covered above. The EU should consider reducing fragmentation across the programmes, reducing the administration burden and streamlining the services it offers. Some examples have been given above in response to Question 6.

Another example is the formation of the European Technology Platforms (ETPs). Overall these are initiatives with very good and needed actions. However, there appears to a number of different types of public-private arrangements. For example, in addition to the ETPs, the EU has established the Joint Technology Initiatives and more recently Public-Private Partnerships. Based on the experience to date the European Commission (EC) could look to reduce the fragmentation. However, the concept of retaining ETPs or PPPs is important as they provide a vehicle for discussing sector level issues to aid the Commission's investment decisions on future calls for proposals.

7. Where might future EU level action be detrimental to your work in this area?

EU enlargement could potentially have a detrimental impact, if it impacts the level of funds UK organisations can access from relevant funding streams, such as access to European Regional Development Funds (ERDF) for building new facilities and capabilities in the UK.

8. Where might action at national rather than EU level be more appropriate / effective?

Action to help boost the number of scientists and engineers in the UK is best done at a national level. In addition, national action should be focused in building technology and innovation centres that are world class and accessible by industry both small businesses as well as large enterprises.

Market areas that require local supply chains (such as where shipping costs is a major factor) are less likely to engage with remote partners (e.g. foodstuffs, packaging, construction).

Market areas where there is significant difference between EU and UK legislation (e.g. support level for renewable energy, a medical technology approved in the UK but not in the EU) might be better locally supported. Note this argument could work the other way – a technology not approved in UK might better access EU markets.

Projects in defense are often better supported within the Nation – for example some research centres in Germany and the Netherlands are prohibited from research in any defense related technology (even protective clothing or hunting equipment).

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

There is a potential need for the EU, in particular DG Research and Innovation and DG Enterprise to better understand the newly formed Catapult Centres and their roles in the UK economy. The business and innovation support infrastructure has significantly changed over the past few years following the closure of Regional Development Agencies. These are newly formed technology and innovation centres, established by the UK government and participation of the Catapults with EU programmes will be of

increasing importance.

Successful research, development and commercialisation approaches demand an international perspective. The European Commission (EC) should continue to build on the objectives of the European Research Area and Horizon 2020 to establish industrially led research projects, enable access of facilities across borders, stimulate demand of innovation via public sector procurement and optimise commercialisation of research outcomes.

There are a number of funding streams that help connect National initiatives across borders such as Eureka, Eurostars, COST and ERA-NETs. These are less well-known. If they are integrated into, say, Horizon 2020, their visibility and hence adoption would increase. For example COST is a funding stream that is little promoted and yet it offers a means to connect researcher/projects across Europe to help solve a technological challenge. Better promotion is required of the different schemes.

The ERANET mechanism provides a clear example of a delivery programme where there is a need for better and agreed alignment of rules, objectives and expectations between member states and the European Commission (EC). The current status, whilst optimising flexibility, does not provide adequate definition to ensure fair and transparent competition. Our current experience with ERANET is that it is unlikely to promote further EU cooperation on this scheme.

EU activities funded by co-operation of National bodies (e.g. ERA-NET, OLAE+) would benefit from a more unified approach in implementation. One example – in OLAE+ projects there was a large difference in the dates for National bodies issuing funding letters, meaning some partners were expected to sign legal project commitments before they had received confirmation of (co-)funding from their Nation.

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

The enlargement of the EU is unlikely to be beneficial to the UK. Engagement of companies located in other non-member countries could still be achieved as it is currently via Associated Countries, who can participate in, say, Horizon 2020 (providing the governments of the Associated Countries contribute funds to Horizon).



The Centre for Process Innovation
Wilton Centre, Wilton,
Redcar, Cleveland,
United Kingdom, TS10 4RF

T: +44 (0)1642 455 340
F: +44 (0)1642 447 298
E: info@uk-cpi.com
W: www.uk-cpi.com