Position statement

Benefits of UK association to Horizon Europe

January 2020

Access to European Union (EU) research and development framework programmes for universities and businesses enhances our global competitiveness by supporting UK scientists to forge links and collaborations between countries, sectors and subjects.

> "I want to look at the strongest possible form of association to Horizon Europe […it is] not only necessary, but essential."
>
> Chris Skidmore MP, Parliamentary Links Day June 2019

The UK is an active participant in Horizon 2020 and our participation in its successor, Horizon Europe, would bring a wide range of benefits to both the UK and Europe. European Union Member States and the European Parliament are currently agreeing the shape of Horizon Europe, which will run from 2021-2027 with a proposed budget of €97.6bn.

We recommend that:

1. Horizon Europe should continue to **support excellence and international collaboration** to benefit Europe's science and innovation base and its citizens.
2. When it leaves the EU, **the UK should associate fully to Horizon Europe** to preserve and enhance these international collaborations and the many reciprocal benefits they bring to both the UK and the European Union.
3. The UK, EU and other international programmes should seek to **align to tackle global challenges**.

Funding for research and innovation

UK research and innovation has received € 6.1bn (£ 5.3bn) through Horizon 2020 so far, with €413m (£379m) awarded to the UK chemical sciences[1].

This funding is important for all parts of the chemistry sector. In 2017/18 UK universities received 23% of their chemistry funding (£55 million) from sources across the EU.[2] Similarly, UK businesses – especially SMEs – benefit from the funding and collaboration opportunities the EU offers. Since the launch of Horizon 2020, UK companies have received €1.16bn (£984m) in EU funding, of which €824.8m (£700m) (71%) went to SMEs. €41.41m (£35.15m) (5%) of the funding for UK SMEs went to companies in the Chemical Sciences and Chemical Engineering.[3]

*In a survey of nearly 5,800 chemists, **75% said EU framework programmes benefit UK science and innovation**, compared to only 3% who said their impact has been negative.[4]*

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Discovery research in the UK benefits significantly from EU funding and is a vital component of a successful research and innovation sector.

Discovery research underpins current and future research and innovation activities. Whilst its impacts can be long term, the history of science shows they often lead to ground-breaking discoveries that deliver new technologies or open up completely new avenues of research. EU framework programmes support discovery research through instruments such as the European Research Council (ERC) and Marie Skłodowska-Curie Actions (MSCA) as part of Horizon 2020's Excellent Science Pillar. 19.4% of the prestigious European Research Council funding in the area of Chemical Sciences was awarded to the UK (€ 197m or £ 169m), more than to any other country.[5]

*Chemists see **funding for discovery research** as a vital aspect of public R&D funding, and one of the hardest to replicate within the UK.[4]*

*The UK has had **4152 participations in the MSCA** to date (16.4% of the total), more than any other country.[3]*

International Collaboration

The collaborations enabled by EU framework programmes are on a completely different scale to what individual countries or bilateral agreements can achieve.

This is vital in the context of tackling global challenges and advancing discovery research, where we can only achieve progress by bringing together the best people, facilities and equipment in the world. For example, the PharmaSea project is developing potential new drugs for Alzheimer's and epilepsy. It owes its success to being able to access EU-wide and global collaborative networks and bring together people with specialist skills not available in any one country.[6]

*Chemists see **access to international collaborative networks, knowledge and expertise** as crucial aspects of public R&D funding.[4]*

*The UK has collaborated with groups in **145 countries** while participating in Horizon 2020.[7]*

International collaborations are associated with more highly cited publications.

An analysis of papers published across our portfolio of 44 journals revealed that papers co-authored by researchers based in different countries or regions have a higher number of mean citations than those with authors from a single country or region.[8] Research funded by EU framework programmes also has a higher average impact in terms of mean citations, significantly higher than research papers funded by the UK Government alone.

To support international collaboration, both through EU framework programmes and partnerships with countries throughout the world, the UK needs an immigration system that is flexible, cost-effective, easy to use, and above all welcoming to scientists and their families.

Mobility is an essential driver for scientific collaboration, and Freedom of Movement across the European Economic Area (EEA) has helped make collaboration through EU framework programmes straight-forward. Upon leaving the EU, to meet the Government's ambitions for UK science and innovation we need a better immigration system for scientists outside the EEA, and to maintain the ease of mobility currently available to EEA scientists. This system must be more streamlined and cost-effective than the current one and must welcome scientists and their families to the UK, whatever the length of their visit and whatever their career stage. To continue to attract the entrepreneurial scientific talent that has contributed to the UK becoming a global leader in science and innovation, the visa system should also consider the needs of individual entrepreneurs and small to medium enterprises as well as larger, multinational organisations.

***84%** of chemists said **Freedom of Movement benefit UK science and innovation**. 71% of chemists, including 60% of UK nationals, felt it had specifically benefitted their career.[4]*

*A **third of UK start-ups** were founded by non-UK nationals and **51% of UK start-up employees** come from outside the UK.[9]*

Global Challenges

To support the delivery of the national and global challenges we face, UK scientists must have access to international networks of researchers with relevant knowledge and expertise.

The nature of mission-led research is that it is broad, involves numerous overlapping disciplines and requires cooperation and collaboration. The chemical sciences community is working to develop innovative technologies to address global societal challenges, from water purification membranes and drought-resistant crops, to new antibiotics, batteries and solar cells. The €5.3bn Innovative Medicines Initiative is the world's largest public-private partnership in the life sciences, supported by Framework Programme 7 and Horizon 2020. The partnership works towards speeding up the discovery and delivery of new medicines to patients across the world. [10]

*An independent report by Mariana Mazzucato, commissioned by the European Commission as part of its preparation of Horizon Europe, states that "Importantly, **such challenges cannot be solved by any single European country**, no matter how large it may be".* [11]

UK, EU and other international research programmes should remain aligned to tackle global challenges.

The European Commission's revised mission areas, which come under the "Global Challenges and Industrial Competitiveness" pillar, cover climate change, cancer, healthy oceans and natural waters, carbon neutral and smart cities, and soil health for sustainable food. Some of these mission areas are closely aligned with the United Nation's Sustainable Development goals.[12] Being involved in research linked to overlapping national, EU and global challenges enables UK scientists to stay up-to-date in or lead on the latest developments worldwide.

Contact

The Royal Society of Chemistry would be happy to discuss any of the issues raised in our briefing in more detail. Any questions should be directed to Kathy Page, policy@rsc.org, 01223 438451.

About us

With around 50,000 members in over 120 countries and a knowledge business that spans the globe, the Royal Society of Chemistry is the UK's professional body for chemical scientists, supporting and representing our members and bringing together chemical scientists from all over the world. Our members include those working in large multinational companies and small to medium enterprises, researchers and students in universities, teachers and regulators.

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[1] Figure generated using Horizon 2020 portal keyword search for 'Chemical Sciences', on 18/11/19. This may not capture all EU funding to UK chemical sciences.

[2] HESA Finances record 2017/18, https://hesa.ac.uk

[3] Figure generated using Horizon 2020 portal keyword search for 'Chemical Sciences' and 'Chemical Engineering', on 10/01/20. This kind of keyword search may not capture some companies labelled differently, for instance SMEs in chemistry reliant sectors such as pharmaceuticals or energy.

[4] Survey of chemical sciences community on their views of European framework programmes, Royal Society of Chemistry, February 2019

[5] Horizon 2020 Project portal, accessed November/December 2019, Chemical Sciences' is a Key Word used to search the portal, and is likely to be an underestimate of the total spend on Chemistry.

[6] http://www.rsc.org/globalassets/04-campaigning-outreach/policy/international-collaborations-create-chemistry/rsc_pharmasea_casestudy_2018.pdf, October 2018

[7] Vinnova, H2020 visualisation (accessed 28/11/2019)

[8] *International collaborations create chemistry*, Royal Society of Chemistry, December 2018

[9] *Science priorities for Brexit – Evidence Report*, House of Commons Science and Technology Committee, July 2017

[10] https://www.imi.europa.eu/

[11] *Mission-oriented research & innovation in the European Union*, European Commission, February 2018

[12] Sustainable Development Goals, United Nations, https://www.un.org/sustainabledevelopment/sustainable-development-goals/