

UK Chemistry funding needs post EU exit

We outline the main asks for the chemical sciences in a future Horizon Europe association agreement and what the UK government must provide if this is not possible.

July 2020

We have collected extensive quantitative and qualitative evidence on the impacts that UK participation in Horizon 2020 has had to date and it shows that **full association would bring the fullest range of benefits to UK chemistry**. This is why we strongly recommended that:

When it has left the EU, the UK should associate fully to Horizon Europe to preserve and enhance international collaborations and the many reciprocal benefits they bring to both the UK and the European Union.

In the [R&D Roadmap](#) published in July 2020, the government said 'It is our ambition to fully associate to both programmes [Horizon Europe and Euratom] if we can agree a fair and balanced deal, but we will make a final decision once it is clear whether such terms can be reached.'

If the UK government doesn't make rapid progress in negotiating full association to Horizon Europe, there will be a gap in funding for science and research when the transition period ends in January 2021.

If the UK cannot associate, or there is a gap between the start of the programme and the UK achieving association, any domestic alternatives must provide the same combination of benefits for both UK researchers and the UK more widely.

Recommendations on alternatives to Horizon Europe:

- Long term, excellence based funding on a comparable scale to the ERC and MSCA.
- Large scale grants that encourage wide-reaching collaborative international networks.
- Specific grants for overseas travel, international collaboration, and access to international facilities to share knowledge, expertise and infrastructure.
- Alignment with global challenges in other internationally collaborative programmes. UK scientists need to continue working with the best across the world on the biggest challenges that face humanity by connecting into existing international collaborations or consortia.
- Tailored support for SMEs.

It may be that partial association to some elements of the new research programme is possible. This is yet to be explored fully, but the recommendations above can help guide as to which parts of Horizon Europe would be a priority. Any partial association agreement should be considered alongside comprehensive measures to maintain and promote the UK research funding landscape domestically.

Background

European science and research programmes

Science is a collaborative, international endeavour. It provides the widest benefits to society when researchers from diverse backgrounds, be that country, sector, discipline or other characteristics, come together. Access to European Union (EU) research and development framework programmes for universities and businesses enhances our global competitiveness by supporting UK scientists to continue working internationally, even now the UK has left the EU.

The UK has been 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.

The UK has collaborated with groups in 145 countries while participating in Horizon 2020.¹

In [The Future Relationship with the EU](#), published in February, the government outlines its approach to negotiations with the European Union. This involves considering a relationship in line with non-EU Member State participation with Horizon Europe and a number of other programmes.

The EU also benefits from the UK's contribution, a recent study found that withdrawal of the UK from the framework would affect work in the 'Excellent Science' pillar primarily, due to the UK's leading role.²

Current plans for Horizon Europe

On 27th May the European Commission president unveiled new proposals for the EU budget from 2021 – 2027 with €94.4bn allocated to Horizon Europe.

Horizon Europe is expected to follow similar structure to Horizon 2020, although there are changes proposed in how funding for industry and global challenges are represented across the pillars (Figure 1).

¹ Vinnova, [H2020 visualisation](#) (accessed 28/11/2019)

² Science | Business article on the study: <https://sciencebusiness.net/framework-programmes/news/loss-uk-eu-research-programme-would-hit-basic-science-networks-hardest>

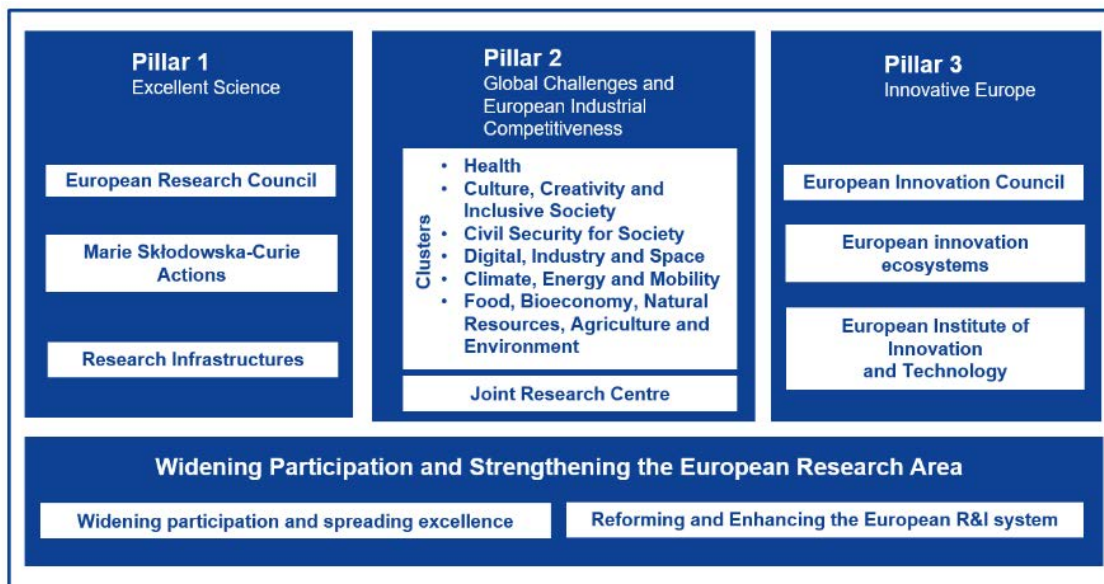


Figure 1: Preliminary structure of Horizon Europe. Taken from: https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en

Evidence from UK participation in Horizon 2020

To date:³

- The UK research and innovation sector has received € 6.1bn (£ 5.3bn) through Horizon 2020, with €413m (£379m) awarded to the UK chemical sciences.⁴
- In fact, the UK is one of the largest beneficiaries of Horizon 2020, second only after Germany, and the chemical sciences win a significant proportion of the competitive, excellence based funding (12.3% of the UK funding through the Excellent Science pillar goes to the Chemical Sciences).⁵
- As a sector the UK chemical sciences mainly benefit from the Excellent Science pillar. 86% of the total Horizon 2020 funding for the UK Chemical Sciences comes through the European Research Council (ERC) and Marie Skłodowska-Curie actions (MSCA) funding streams (€197 million and €158 million respectively)⁵.
- Furthermore UK Chemistry Departments received 23% of their total funding from EU sources in 2017/18.⁶
- Other funding streams where the Chemical Sciences and Chemical Engineering take a significant proportion of the UK total include the Innovation in SMEs fund (€4.46 million, or 12.1%)⁵, and the Nanotechnologies fund (€9.55 million, or 15%)⁵; both are parts of the Industrial Leadership pillar.

³ See individual references for date stamps of when the information was collected

⁴ 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.

⁵ Data collected November/December 2019 (pre data upload on 23rd December).

⁶ HESA data for 2017/18, purchased by the RSC.

- Non-financial benefits of participation in these multi-national schemes include supporting longer-term growth of business, enabling researchers to do riskier, long-range research, and allowing UK researchers to work on research that could transform global policy in the future.

Evidence from our community has revealed that some of the non-financial benefits of involvement with Horizon 2020 and other EU framework programmes include:⁷

- Access to large, pan-European collaborative projects like the Innovative Medicines Initiative (IMI) and Human Biomonitoring for the EU (HBM4EU)
 - Essential access to European infrastructure, e.g. computing power
 - Encouragement and assistance to collaborate with industry earlier
 - Large-scale, long-term funding for discovery research through the ERC
 - Connection to some of the best talent in Europe for collaboration and recruitment
 - Access to and support towards navigating international markets for business
- From our survey in Feb 2019⁸, 63% of respondents said that the factor that was most important in public research and development funding was access to collaborative networks that span different countries, disciplines or sectors. The other two most popular factors were access to international knowledge and expertise (49%) and access to international facilities or equipment (33%).
 - Another question from the same survey probed the achievability of replicating some of the aspects of EU framework programmes. 65% of respondents said large scale grants (from tens to hundreds of millions of Euros) would be ‘difficult’ or ‘very difficult’, 61% said the same about long-term grants (five years or more).

Urgent action is needed to ensure that research and development across the UK can be stabilised during a period of uncertainty and turbulence, if it is to continue to contribute to our wellbeing, society and the economy. Negotiations on the future UK-EU relationship are continuing at a time where R&D spending is already being squeezed, as institutions’ and charities’ budgets are affected by the coronavirus crisis.

The RSC’s response⁹ to the Sir Adrian Smith review on ‘[Changes and Choices: Future Frameworks for international collaboration on research and innovation](#)’ included 3 overarching principles to be considered in any new UK funding arrangements:

1. International: new funding streams for collaboration must enable UK association to Horizon Europe and support UK researchers to build global partnerships. Funding streams must also recognise the importance of a two-way flow of knowledge and expertise into and out of the UK.

⁷ [International Collaborations Create Chemistry](#), Royal Society of Chemistry, December 2018

⁸ Survey performed by the RSC (Feb 2019) which almost 5800 chemical scientists responded to.

⁹ [RSC response to the Smith review](#)

2. Independent and long-term: funding streams must be independent of political agendas and timescales, with grants that run for five years and longer, as scientific discovery and breakthroughs can be long-term endeavours.
3. Interpretable: a simple format for showing how funding streams fit together, what they are for and how to apply will support researchers in navigating and applying for the right funding.

Recommendations on alternatives to Horizon Europe

In the R&D Roadmap the government said ‘If we do not formally associate to Horizon Europe or Euratom R&T, we will implement ambitious alternatives as quickly as possible from January 2021 and address the funding gap.’¹⁰

Building on our evidence, we think the UK chemical sciences need accessible and easy to use schemes in the form of:

- **Long term, excellence based funding on a comparable scale to the ERC and MSCA.** This should be independent from political agendas, with rigorous scientific assessment and enable curiosity and discovery driven research. To build any kind of UK scheme that has the global reputation, prestige and impact of the ERC and MCSA will be challenging as these have been developed over years of significant investment, active building of open international networks and recognition from nations in the EU and beyond.
- **Large scale grants that encourage wide-reaching collaborative international networks.** In the absence of association to Horizon Europe, the UK government has to review its capability and capacity to support international scientific collaborations. To ensure that UK researchers and innovators can still make the same or greater impact through new international networks led by the UK, the UK needs a step-change in our levels of international engagement. Government would need vast capacity across a number of different departments to reap the full range of benefits that large-scale international collaboration brings. This includes capacity in the Science and Innovation Networks and its parent departments, but may need to extend to where expertise and capacity needs to be built in other departments. For example, where are the capacity and structures to connect promising UK SMEs with business mentors in other countries to ensure that they become the international exporters of tomorrow?
- **Specific grants for overseas travel, international collaboration, and access to international facilities to share knowledge, expertise and infrastructure. This should both bring the best talent to the UK, and encourage UK scientists to work with the best abroad.** A key part of encouraging this will be ensuring that the new immigration system has a streamlined visa application process and is welcoming in both substance and attitude. The UK should seek ambitious reciprocal mobility arrangements with future trading partners across the world in order to enable scientists to move around and to collaborate on both a long and short-term basis.¹¹
- **Alignment with global challenges in other internationally collaborative programmes. UK scientists need to continue working with the best across the world on the biggest challenges**

¹⁰ Page 43, [UK Research and Development Roadmap](#), July 2020

¹¹ RSC Position Statement on [Mobility in the Chemical Sciences](#), April 2020

that face humanity by connecting into existing international collaborations or consortia.

Many international collaborative programmes on global challenges bring together cross sector collaboration with interdisciplinary and international collaboration. UK programmes on global challenges must make it easy for all UK actors to 'plug into' these existing international networks, without unnecessarily complex application processes.

- **Tailored support for SMEs. In the absence of access to Horizon Europe, SMEs need large scale early stage funding, access to international networks and markets, and support and mentorship.** SMEs should also be eligible for other forms of funding, including longer term, excellence based grants, and international consortia. We know from many SMEs in our community that connections to other actors through international networks to recruit in specialist talent to support their cutting-edge businesses was vital to their growth.