Why the UK should associate to Horizon Europe

As a member of the EU, the UK has full access to EU research Framework Programmes and the funding, networks, collaborations and infrastructure they provide. Horizon Europe is the EU's next ambitious research programme. Following Brexit, the UK will have to decide if it is going to seek to associate to Horizon Europe or look to establish its own alternative. This paper explains why securing association is the best approach.

- **The EU Framework Programmes are the most ambitious multilateral funding schemes in the world, and participation is increasingly global**. Horizon 2020 has funded more than 7,500 collaborative projects with participants from 149 countries. The budget for Horizon Europe is expected to be €100 billion, and the programme will attract associated and third countries beyond Europe for us to collaborate with.

- **Europe is the UK's biggest collaborator on research**, and these links are a national asset. The EU28 produce a third of the world's scientific publications. By associating to Horizon Europe we can capitalise on the excellent collaborative networks we already have, without limiting the scope for growing new connections elsewhere.

- **The benefits of associating to Horizon Europe will be more than financial**. Participation would allow us to continue to influence the research agenda in Europe and beyond, with the UK involved at the earliest stages in debates on regulation and standards.

- **There are no quick and cheap ways to replace Horizon Europe**. Implementing new multilateral or bilateral programmes at short notice will likely mean compromising on ambition, efficiency, and scale. The EU Framework Programmes have a world-renowned reputation for excellence, which cannot be replicated quickly.

The most ambitious multilateral funding schemes in the world

Horizon Europe will provide a significant, pooled budget**:**

- Horizon 2020, the current Framework Programme, has made €77 billion[i] of funding available. Horizon Europe its successor, is expected to increase this to €100 billion.[ii]
- By pooling resources and mutually respecting decisions, a common pot system avoids the risk of "double jeopardy", where multiple funding agencies must all independently approve a collaborative application for it to proceed.

Horizon Europe will provide value for money and big economic returns:

- Framework Programmes are efficient, with administration costs for Horizon 2020 currently accounting for less than 5% of the total budget,[iii] which compares favourably to national-level schemes.
- The schemes also generate substantial economic returns. Data from the last full Framework Programme (2007-13) shows that for every €1 spent, the direct and indirect economic effects produce €11.[iv]
- Since 2014, Horizon 2020 has funded more than 7,500 collaborative projects with participants from 149 countries.[v] Associating to Horizon Europe does not mean that the UK will miss out on building ties with other countries.

Europe is the UK's biggest collaborator on science, and these links are a national asset

EU partnerships have made Europe, and the UK, a world-leading location for science. Over half of the UK's collaborative papers are with EU partners,[vi] and countries that are geographically close are more likely to collaborate.[vii] The EU28 produce a third of the world's scientific publications, with only 7% of the global population.[viii]

To achieve the Government's vision for "Global Britain", and to dramatically increase foreign and domestic investment in research as a proportion of GDP, the UK's international collaborative networks should be expanded, rather than replaced. Association need not limit the UK's ambitions to develop new networks, and can be a central part of the Government's international research strategy.

The benefits of associating to Horizon Europe will be more than financial

EU funds foster global collaboration, create new disciplines and build business networks:

- UK clinical trials on diseases with limited patient populations are especially reliant on EU collaboration. The UK has the third highest number of total joint clinical trials with other EU countries, and the second highest number for rare diseases and paediatric patients.[ix]
- EU funding helps to establish new disciplines and supports UK companies to engage in Europe.[x] For example, Clean Sky is an EU programme developing cutting-edge technology to reduce aircraft CO_2 emissions. UK involvement in Clean Sky amplifies domestic funding, enhancing its impact and provides UK companies with a critical route to engage and cooperate with new customers in Europe.

There are no quick and cheap ways to replace Horizon Europe

Framework Programmes are prestigious and competitive. Securing competitive funding against a wide pool of EU applicants boosts the ambitions of UK research, and cements its international reputation.

- *"Think about football, and think about if there were only national leagues and there was no Champions League, then we would never be able to see Manchester United playing against Real Madrid, and we would never get to see how playing with and against each other makes European football fantastic.*" Prof Matteo Carandini, GlaxoSmithKline/Fight for Sight Professor of Visual Neuroscience, University College London

- Seven researchers funded by EU schemes have been awarded a Nobel Prize, including British scientist Professor Sir Peter Ratcliffe this year.[xi]

Productive research collaborations take time to construct:

- Securing access to Horizon Europe would deliver much-needed stability to both UK researchers and their potential international collaborators for at least a 7-year period. Collaborative partnerships start to form many years before funding is awarded, and there has already been a fall in UK participation rates in Horizon 2020 since 2016.

The challenge of replicating the benefits of Framework Programmes through a new system should not be underestimated

- Prestige cannot be quickly bought through a domestic scheme. The EU Framework Programmes have built their reputation over many years, which helps participating countries to attract top global talent. It would be difficult for the UK to compete against the EU in attracting leading scientists, especially in the short-to-medium term.
- There would be major costs and logistical challenges to the UK setting up a replacement scheme – as set out in Wellcome's submission to the Adrian Smith review.[xii]
- Deep collaboration on research is supported by alignment of regulation. We are currently aligned with EU regulations but not with other countries, and it would take time to change this. For example, the EU strongly values animal welfare and requires that macaque monkeys have a minimum cage size of 2 m^2 , compared to 0.2–1.4 m^2 in the USA.[xiii] Differences such as this make collaboration more difficult and costly. Cancer Research UK have reported that differing standards had made some EU–USA trials unfeasible.[xiv]
- In global terms, any new UK programme will be small relative to others, which reduces the UK's ability to set the regulatory and research agenda. As a comparison, the US National Institute of Health (NIH) spends the equivalent of over £30 billion annually on research. The UK Medical Research Council and National Institute for Health Research combined spend under £2 billion.[xv]

What about the rest of the world?

Horizon Europe will be at the heart of national spending plans across Europe and beyond, with little budget left for additional deals with the UK. Stepping away from Horizon Europe could mean losing long-established collaborative networks in Europe, with no guarantee new ones can be found elsewhere.

Associating to Horizon Europe does not mean that the UK will have less scope for forging new links outside Europe. Horizon Europe is expected to become highly international itself, with countries such as Argentina, Australia, Brazil, Canada, Japan, New Zealand, South Africa and the USA expressing an interest in participating.[xvi]

Background: What is Horizon Europe?

Horizon Europe is the EU's ambitious €100 billion research and innovation programme that will run from 2021-2027. The program aims to strengthen European science and technology research, boost innovation capacity, competitiveness and jobs, and deliver on citizens' priorities.[xvii] Horizon Europe will also include mission-led research, that will address global challenges – including climate change, healthy soil and food, and cancer.[xviii] The Commission has made its initial proposal for Horizon Europe and is currently in negotiation with the Council and European Parliament.

The Framework Programme is structured around 3 pillars:

1. **Excellent Science**: focused on scientific impact, this pillar aims to reinforce and extend the excellence of EU science. This pillar includes the European Research Council and Marie Skłodowska-Curie Actions, which are prestigious personal awards (so-called "mono-beneficiary" schemes). These schemes support talented researchers through substantial long-term grants, and help them to move their work to another country. This pillar also includes coordination of developing new research infrastructure.
2. **Global Challenges & European Industrial Competitiveness**: focused on societal impact and large-scale collaboration, this pillar aims to boost key technologies and solutions to meet the Sustainable Development Goals. This pillar is currently designated €52.7 billion of the total budget.
3. **Innovative Europe**: focused on economic impact, this pillar aims to stimulate breakthroughs that create new markets and an innovative ecosystem across Europe. It includes the new European Innovation Council and SME schemes.

Should the UK participate as an associated country or an industrialised third country?

The Framework Programme legislation allows non-member states to participate either as an 'associated country' or an 'industrialised third country'. Our full analysis explains this in more detail.

Associated country

- Associated countries participate in all parts of Framework Programmes, through a dedicated association agreement. Organisations and researchers from associated countries have a similar status to those from EU Member States and can participate under the same conditions.[xix]
- The variety of existing models of association reflects the diversity of countries involved – for example, the agreement with Israel does not include freedom of movement or regulatory alignment. On the other hand, as a European Economic Area (EEA) member, Norway is in the EU single market and signed up to free movement of people.

Industrialised third country

- Industrialised third countries can only participate in some parts of the Framework Programmes. As a third country, UK researchers could only access EU funding from restricted themes agreed in advance.
- If the UK were a third country it would not be able to participate in the European Research Council and Marie Skłodowska-Curie Actions programmes, where we currently win over

20% of the available grants,[xx] and would have no access to funding for industrial partnerships and collaborations.

- UK researchers would also be restricted from leading projects funded through the Framework Programme.

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About Wellcome

Wellcome is a global charitable foundation working to improve health, supporting over 14,000 researchers in more than 100 countries. Last year over 200 organisations and individuals from across Europe gave us their views on EU-UK collaboration and this briefing reflects this consultation.[xxi]

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[i] https://ec.europa.eu/programmes/horizon2020/en/background-material
[ii] https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en
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[xvi] https://sciencebusiness.net/framework-programmes/news/eu-begins-discussions-horizon-europe-eight-countries
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