Written evidence submitted by GW4 Alliance (BER0045)

1. The GW4 Alliance brings together four of the most research-intensive and ambitious universities in the UK; the universities of Bath, Bristol, Cardiff and Exeter. We have a combined research income > £370m, employ > 8,000 academic staff and train > 23,000 postgraduate students. As individual universities with thriving innovation cultures, we make a substantial contribution to the global knowledge economy. Through GW4, we can create new opportunities at an unprecedented scale to respond to major policy developments, to attract global talent and build a highly skilled workforce, and work in partnership with industry to drive innovation and globally competitive Research & Development (R&D).
2. The Government's Research and Innovation funding allocations 2017-2021 demonstrate a strong commitment to increasing its investment to support the UK's world-class research and innovation system and drive productivity and growth.[1] The current R&D funding and governance landscape in the UK is complex and evolving rapidly, therefore we endorse the values of UKRI of collaboration, excellence, innovation and integrity as guiding principles to navigate this environment and deliver on this commitment. We welcome UKRI's wish to ensure that quality, value for money and sustainability are embedded in all activities to safeguard the effectiveness of public spending on R&D. We encourage the approach to work in partnership with those at the front line of research and innovation to identify emerging opportunities.
3. We support the explicit, continued commitment to the Haldane principle to make funding decisions based on excellence and making proper use of expert view in these processes.
4. We agree that the recent funding allocations demonstrate strong commitment to the dual support system. It is vital that the UK's research base is underpinned by both quality assessment exercises indicating research excellence and by peer-reviewed project competitions. We believe it is essential to maintain both arms of the dual support system and a balanced approach for block, responsive and directed funding; the best ideas flourish in a balanced ecosystem.
5. Whilst recognising the rationale for collaborative, industry-led funding, we also recognise the potential risk of not maintaining, or worse, decreasing the level of funding available to support the discovery research which underpins all these R&D activities. A strong underpinning discovery base is imperative to ensure industry engagement.
6. The quality-related (QR) component gives universities a flexible and sustainable model with which to deploy resources into cutting-edge areas of research and innovation and this is effective in supporting strategic thinking, planning and action. It allows us to invest in people and facilities, to respond quickly to emerging opportunities and to leverage investment from business and charities that could otherwise flow out of the UK.
7. The GW4 Alliance is a prime example of how deploying QR funds add value to each of our partners' research and innovation endeavours. To date, the GW4 Building Communities programme has invested £2.3M, catalysing 74 research communities; for every £1 we spend on developing these collaborations we receive almost £12 in external grant funding. From these communities we have forged new links with >140 external partners (e.g. Ministry of Justice, Airbus, Sky News and the European Space Agency). We help catalyse programmes such as the Institute of Coding; led by the University of Bath and bringing together universities, large corporates, SMEs and professional bodies to develop and deliver innovative, industry-focused education across the UK.[2] We have one of the largest postdoctoral and clinical training portfolios of any regional university partnership; >30 externally-funded GW4 doctoral training entities are hosted by one of the partners across the Alliance. We build connections with external stakeholders, driving forward recommendations from the BEIS-sponsored and GW4-led South West England and South East Wales Science and Innovation Audit (SIA), in areas such as high

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/731507/research-innovation-funding-allocation-2017-2021.pdf

[2] https://researchportal.bath.ac.uk/en/projects/gw4-coding

value design engineering, digital innovation, compound semiconductors, and resilience and sustainability.[3]

8. Within our institutions, we have, for example, deployed QR funds to support the development of University/Specialist Research Institutes which reflect university strength and depth in key research areas (Bristol, Cardiff, Exeter) and introduced fellowship initiatives across all disciplines to advance research careers and leadership potential. These early career research (ECR) schemes (e.g. Ser Cymru; Bristol Vice-Chancellor's fellowships, Bath Prize Fellowships, and the University of Exeter's ECR networks, liaison forums and training) have also leveraged significant external and philanthropic investments.
9. The success of this flexible and sustainable model is further evidenced by the recent Wellcome Trust report 'Empowering UK universities: how strategic institutional support helps research thrive,'[4] which includes a case study from Cardiff University on the development the world's first compound semiconductor cluster in South Wales, CSconnected. Strategic institutional support, with co-investment from IQE and Welsh Government, was integral to securing the £50m Compound Semiconductor Applications Catapult Centre for South Wales.
10. The same report states that 'the ambitions set out in the Government's Industrial Strategy, and the growth in mission-led funding, will all rely on strategic institutional support to underpin and deliver the coherent and efficient research system needed to achieve their goals.' As we see increasing levels of UKRI funding directed at cross-disciplinary strategic challenges and initiatives, the role of QR in providing both stability and flexibility will become even more critical.
11. There is an increasing expectation for institutional contributions to public funding of research and innovation, from individual fellowships to large, interdisciplinary endeavours. The ability for institutions to support the breadth and depth of these high-quality propositions can be limited by this expectation. This could be further compounded by progressively directed QR allocations. We encourage engagement between UKRI and institutions to manage realistic contributions to ensure that the wealth of internationally competitive research and innovation can be realised.
12. The introduction of directed QR funding to support institutional Global Challenges Research Fund (GCRF) activities is a key example of this. It will enable the delivery of institutional visions for GCRF research, allowing institutions to bring a strategic approach to recruitment, external partnerships, infrastructure development, impact and innovation. Whilst we welcome this new programme we highlight the need for the sector to work together in discussing evolution, delivery, evaluation and sharing of best practice.
13. It is well documented that the UK's withdrawal from the EU may pose challenges for research collaboration, research mobility, and for staff and students from all nations who come to, and already work in, UK universities. However the potential reduction in EU funding opportunities may proportionally affect Humanities, Arts and the Social Sciences more than Science, Technology, Engineering and Medicine. A recent article from the British Academy states "13 out of the top 15 disciplines with the highest amount of funding from 'EU government bodies' as a total proportion of that discipline's funding are in the arts, humanities and social sciences."[5] Therefore the rationale for the balance of funding across disciplines must take such imbalances into account.
14. We endorse the findings of the 2017 National Audit office report 'Cross-Government Funding of Research and Development'[6] which considered the effectiveness of government's arrangements for coordinating research activity and maximising the value of government's investment in

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[3] http://gw4.ac.uk/sww-sia/

[4] https://wellcome.ac.uk/sites/default/files/empowering-uk-universities-how-strategic-institutional-support-helps-research-thrive.pdf

[5] https://www.britac.ac.uk/why-brexit-matters-humanities-and-social-sciences

[6] https://www.nao.org.uk/wp-content/uploads/2017/11/Cross-government-funding-of-research-and-development.pdf

research and development. It recommended that UKRI could take a lead in efforts to join up the research landscape, address cross-cutting challenges, improve the quality of evidence on the UK's research and innovation landscape, and in raising awareness off gaps or overlaps in research programmes, skills, capability or infrastructure.

15. However, we recommend that assessment of the balance of public funding should also include consideration of NIHR funding streams, particularly where Full Economic Costing is not applied.
16. Furthermore, we encourage a more holistic approach to schemes across the research councils to develop impact and build partnerships and address the innovation gap between the outputs of discovery research and the entry levels for Innovate UK support. Impact Acceleration Accounts (EPSRC, ESRC and MRC) to develop these are vital and transformative. We would recommend an expansion of these schemes both in volume and across the all the research councils. Currently, AHRC, NERC and BBSRC (for different and valid reasons) do not provide this form of support. At present the knowledge exchange mechanisms are potentially disconnected and we would encourage a UKRI-wide approach to their implementation and evaluation.
17. To strengthen productivity it is imperative that the entire ecosystem is engaged: infrastructure, people, research (across the spectrum of discovery to applied) and development. Therefore, whilst funding should be industry-centred and challenge-led, all the resources should not be allocated to or through business as will not prove most effective mechanism to deliver the Industrial Strategy (e.g. Exeter pioneering cheap and efficient solar energy).
18. In Wales the two arms of the 'dual support' system are represented by funding from the research councils and HEFCW (rather than Research England). Cardiff University has concerns, which are not unique in the Welsh HE sector, over the imbalance which results from the inclusion of Research England within the envelope of UK Research & Innovation as prescribed in the Higher Education and Research Act 2017. UKRI should make every effort to engage with HEFCW and the Welsh Government on devolved matters to secure Wales' full participation in driving economic prosperity through research and innovation. We are pleased to note the recent Reid Review's endorsement of Sir Ian Diamond's recommendations, that QR in Wales should be protected and a HEIF-like fund for knowledge exchange should be established.
19. Therefore, there is disconnect both between Research Council knowledge exchange mechanisms and mechanisms (or lack of) across the devolved nations. These discrepancies between public funding streams across the UK landscape cause disconnects in the ability for inter-institutional and inter-disciplinary collaboration across the UK.
20. In relation to QR and capital funding, we welcome the establishment of UKRI's Balanced Funding Working Group (BFWG), including representation from the funding councils of the devolved administrations, to further consider the evidence-base and rationale for QR and capital funding. We wish to stress the importance of universities engagement with BFWG to develop this programme.
21. Throughout the development of the Industrial Strategy, we have welcomed the comprehensive and long-term approach to shaping an industrial strategy and commitment to driving growth across the whole of the UK. We endorse the views of UKRI strategic prospectus that 'economic growth depends increasingly on knowledge, and the UK must do more to make the most of its world class research' and welcome the vision to push the frontier of human knowledge and understanding alongside the delivery of economic, and social and cultural impact. We believe that universities are central to addressing the key challenges of the UK economy and that a vital part of the success of the Industrial Strategy will be sustained commitment to increase R&D investment to levels similar to our global competitors.
22. We endorse the fundamental principles of Industrial Strategy Challenge Fund (ISCF) support that Government funding should leverage at least equivalent co-investment from industrial and other collaborators. A key challenge will be to grow industrial expenditure on R&D to meet the 2.4% GDP target and, if the current gap between 1.7% and 2.4% is met, that would produce £13bn pa.

To leverage the best ideas which can put the UK at the forefront of the industries of the future, research excellence must remain the guiding factor in the implementation of the ISCF.

23. We support the rationale for directed funding for an industry-led, multisectoral approach to the Industrial Strategy to ensure we can compete globally after the UK leaves the European Union. This competitive position requires a long-term approach. Projects of the scale required to deliver the Industrial Strategy are the result of long-term relationships and confidence that co-working can increase the competitiveness of the individual organisations.
24. To gain the greatest benefit for the UK, new collaborations need to be supported to develop and mature so that the strongest propositions and partnerships can be developed in response to each challenge and mitigate the risk of perpetuating old and known approaches at the expense of the new and innovative. Therefore we greatly value UKRI's early engagement with research communities to solicit and engage partners in the development of initiatives as well as ensuring coherence and transparency in the approach. By maintaining an open dialogue with UKRI, we can then deploy QR (and HEIF where available and appropriate) funding and schemes such as our GW4 Building Communities programme to support engagement with new partners, ensure the appropriate configuration of networks to mature propositions as future challenges are assembled.[7]
25. As a research alliance of leading research-intensive universities in South West England and South East Wales, we unequivocally endorse mechanisms to support UK-wide, place-based growth. We support the complementary channels for research and innovation and place-based growth; recognising that universities have a key role to play in both mechanisms. Self-formed university partnerships, such as ourselves, have a key role in ensuring regional competitiveness; we continue to encourage the Committee to consider our roles in the delivery of a successful Industrial Strategy.
26. As referenced earlier in this submission, we support the explicit, continued commitment to the Haldane principle to make funding decisions based on excellence and making proper use of expert view in these processes. However, decisions around support for the innovation ecosystem need to consider additional factors including the extent of industrial R&D capacity and activity within the immediate catchment of an investment infrastructure, the likely effectiveness of plans to extend the geographic range of beneficial activities and the extent to which a region is positioned to benefit from, actively exploit and co-invest in any given resource. The latter, regional factors should be key elements of decision making behind legitimate and transparent place-based investments.
27. We believe there is an imbalance between different parts of the country in Government funding of research/innovation and we welcome the introduction of the Strength in Places fund which acknowledges the importance of place. In building an innovation ecosystem which is geographically balanced, distributed and resilient, the UK needs to recognise and invest in high calibre R&D capacity which is already delivering at scale outside of traditional research clusters. There are many R&D hubs around the UK that, if properly invested in, would deliver real benefit for productivity, skills and jobs and would help rebalance the economy.
28. We encourage Government to take full advantage of the investment opportunities identified by regional consortia as part of the BEIS-sponsored SIAs. They have established an unrivalled knowledge base about the opportunities and gaps in the innovation landscape. The GW4-led South West and South East Wales SIA, and the South Wales Crucible SIA have developed and are taking forward a range of compelling propositions (see below). These investments benefit from being industry-led, supported by universities which are committed to playing central roles in economic renewal and endorsed by key public sector agencies including LEPs and city deals.
29. GW4 partners, in conjunction with key industrial partners are developing several initiatives which are aligned with the Industrial Strategy. We look forward to bringing these to maturity:

[7] http://gw4.ac.uk/funding-development/

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I. Great Western HIgh Value Design Centre for Advanced Engineering (GW-HIVE) will exploit the region's globally leading provision of high value engineering to undertake and rapidly mature industrial out-of-cycle development of future products, enhancing productivity, providing an open innovation environment and increase our agility through development of new design tools.

II. Compound Semiconductors (led by IQE Plc) is a programme support UK companies to participate in pilot line projects to develop an integrated supply chain that will incorporate the growth of new and novel materials via device prototyping and characterisation through to high value products. The focus will be on three mega-trends of energy efficiency, communications and safety and security, positioning the UK as a global centre of excellence and enabling it to maximise its share of the global market.

III. NUCLEATE is an open innovation and technology centre for nuclear energy which will create and attract the flexible facilities and funding required to help nuclear operators and their supply chains achieve the ambitious cost-reduction targets for new-build and legacy decommissioning identified in The Nuclear 'Sector Deal'. Working across advanced materials, robotics & sensors and digital safety & security NUCLEATE will ultimately form part of a seamless technology pipeline across the south west and help secure the UK as an international centre for nuclear innovation.

IV. Creative Industries: The region has received two multi-million pound awards from the AHRC-led Industrial Strategy Creative Industries Clusters Programme. The University of the West of England, University of Bristol, Bath Spa University and the University of Bath, joint with Watershed, and companies working across design, broadcast, performance, technology, publishing, and other sectors have received funding for a mix of development labs, fellowship schemes and large project funding, building on existing thematic strengths in the region including XR (immersive experiences), live performance and 5G. Cardiff University has also led on a successful bid, with the University of South Wales and Cardiff Metropolitan University, as well as the Welsh Government, Cardiff Council, all major Welsh broadcasters and more than 60 screen industry businesses. Clwstwr Creadigol will focus on screen industries to enable the already thriving scene in South Wales reach its full potential.

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