

Letter from Rt Hon Norman Lamb MP to Rt Hon Philip Hammond MP

Science budget and Industrial Strategy

1. I am writing on behalf of the Science and Technology Committee to highlight the importance of a Budget on 22nd November which boosts funding for science and innovation as Brexit negotiations continue; strengthens place-based policies for science and innovation, to spread and deepen productivity growth; and signals the start of a fundamental appraisal of Government's innovation support programmes. Those measures will have to work in the context of a forthcoming Industrial Strategy White Paper, which should: clarify the link between the Industrial Strategy Challenge Fund and 'sector deals'; balance support for established sectors and disruptive new technologies; and coordinate the ISCF with other elements of the National Productivity Investment Fund to support infrastructure projects that could underpin further place-based science and innovation policies. The White Paper should be published as soon as possible, even against a still uncertain Brexit background, to help demonstrate the long-term direction of travel of the Government's industrial strategy.

2. Specifically, we urge you in the Budget to:

- give a clear commitment now to the UK's full participation in Horizon 2020 throughout the relevant research projects and throughout the proposed Brexit implementation period, as well as to the EU's successor 'Framework Programme 9' or offer an alternative vision for future close collaboration on European research programmes on a similar scale.
- clarify the rationale for the selection of the 'challenges' on which the Industrial Strategy Challenge Fund is based and how these may evolve as the programme proceeds in future, and present a coherent programme of planned ISCF themes and potential 'sector deals' that together make the overall direction of travel for the industrial strategy unambiguous.
- extend place-based research and innovation interventions, building on existing strengths in specific places, including the location of future new research institutes outside the 'golden triangle', and ensure that the ISCF is coordinated with other elements of the National Productivity Investment Fund to ensure infrastructure planning takes account of the need for a wider geographical distribution of science and innovation.
- establish a place-based fund for supporting a geographically more dispersed science and innovation footprint beyond the south-eastern 'golden triangle', and encourage regional economic development based on areas of scientific excellence.
- consider how the R&D Tax Credit system might be better targeted—for example to improve R&D investment in specific regions.

- initiate a fundamental assessment of the balance of funding across the many Government innovation support initiatives, to feed into the Industrial Strategy White Paper.
- publish David Connell’s review of the Small Business Research Initiative without delay, along with the Government’s response, and establish a central fund and management for the SBRI and encourage all Government departments to deploy it.
- acknowledge that a further science budget uplift will be needed over the next 10 years of at least a further £2.4bn to help deliver the Government’s 2.4% of GDP target for overall R&D expenditure, and begin by increasing—or at least signalling such an increase—within the current Spending Review period.

3. We elaborate on the rationale for these measures below. Further information on the issues is available in the written evidence we received and the oral evidence we took on 7 November from eight witnesses; all of which we have published on our website.¹ We are grateful to all of those involved for their contributions.

Brexit and future R&D collaboration

4. In its report on the Industrial Strategy Green Paper,² our predecessor Committee commented that “There is a weakness in the industrial strategy in that it could give more room for discussing or even acknowledging its links with Brexit. The industrial strategy must be configured to shape our Exit negotiations, but equally those negotiations will affect what can be achieved through the industrial strategy as well as how the different measures envisaged should be prioritised and re-prioritised.”³ The Government responded in September 2017 that:

“Leaving the EU allows us to make fresh choices about how we shape our economy and presents an opportunity to deliver a bold, long term Industrial Strategy that builds on our strengths and prepares us for the years ahead. ... The [planned] White Paper is just a stage in the process of developing and evolving our Industrial Strategy, which will help people and businesses across the UK to adapt to the changing landscape of the economy, whether that is relating to our departure from the European Union, globalisation or technological changes.”⁴

5. As Professor Paul Boyle of Universities UK put it, “the timing is unfortunate”. He was most concerned that there might be a gap in our involvement in the Horizon-2020 research programme and its successors if continuity is not made possible in the Brexit process.⁵ As Professor Chris Whitty, the interim Government Chief Scientific Adviser, pointed out last month, the Government’s science-related Brexit position paper⁶ was “high

1 Committee [inquiry website](#)

2 HM Government, [Building our Industrial Strategy’ Green Paper](#), (January 2017)

3 Science and Technology Committee, [Industrial Strategy: science and STEM skills](#), Thirteenth Report of Session 2016–17, HC 991 (April 2017)

4 Science and Technology Committee, [Industrial Strategy: science and STEM skills: Government Response to the Committee’s Thirteenth Report of Session 2016–17, HC 335](#) (September 2017)

5 [Oral evidence Q60](#)

6 [Collaboration on science and innovation: A future partnership paper](#) (September 2017)

on aspiration and a bit light on detail”.⁷ The CBI’s surveys have identified some slowing in business investment decision-making while Brexit details remain uncertain. Tom Thackray from the CBI thought, nevertheless, that the White Paper should be published as soon as possible “to give a direction of travel” — “For business’ perspective, we need to get on and start focusing on where we can invest”.⁸

6. It is important that the White Paper, as the Government has promised, helps people and businesses to adapt to Brexit and the wider changing landscape of the economy. The White paper should be published as soon as possible, even against a still uncertain Brexit background, to help demonstrate the long-term direction of travel of the Government’s industrial strategy.

7. Part of the challenge in adapting to Brexit is an uncertainty about the UK’s continued involvement in the EU Horizon-2020 research programme. EU funding through Horizon-2020 provided €1.2 billion to UK-based organisations for research project bids submitted in 2015 (16% of the total funding allocated). Professor Richard Jones, one of our witnesses, emphasised how in addition to the funding made available from Horizon-2020, “it is more valuable because it gives us connectivity and competition. ... We benefit enormously by collaboration with other researchers across Europe.”⁹ Researchers are attracted to the UK in part because of the EU research awards it receives.¹⁰ The Government’s recent Brexit position paper on science emphasised that “the UK will continue to welcome the brightest and best”, with the UK remaining “a hub for international talent”,¹¹ and Jo Johnson assured us last month that “we are very focused on making sure that our universities continue to have access to the bright minds they need to thrive”.¹²

8. The science minister has highlighted the Government’s commitment to underwriting the full funding for Horizon 2020 grants that are awarded to UK researchers before we leave the EU,¹³ which, as the Royal Society has noted, has reassured many in the research community. The Royal Society nevertheless wrote to the Prime Minister in October 2017, highlighting that “uncertainty is still a real threat that could lead to UK researchers being marginalised from Horizon 2020 collaborations and to scientists leaving the UK to seek greater stability”.¹⁴

9. The Secretary of State for Leaving the EU told the Brexit Committee in October that he expected the UK will be taking part in Horizon-2020 beyond Brexit, but that the Government had not yet engaged with the EU on this.¹⁵ Jo Johnson assured us last month that any ‘entrance fee’ that has to be paid to continue to participate in Horizon-2020 and its successor programmes will not be drawn from the current science budget settlement.¹⁶

7 Prof Chris Whitty [oral evidence](#) to S&T Committee, 17 October 2017, Q11

8 [Oral evidence](#) Q62

9 [Oral evidence](#) Q56

10 [Oral evidence](#) Q57 [Professor Boyle]

11 [Collaboration on science and innovation: A future partnership paper](#) (September 2017), para 16

12 Jo Johnson [oral evidence](#) to S&T Committee, 17 October 2017, Q12

13 Jo Johnson [oral evidence](#) to S&T Committee, 17 October 2017, Qq13, 15

14 [Letter from President of the Royal Society to the Prime Minister](#), 19 October 2017

15 David Davis [oral evidence](#) to Brexit Committee, 25 October 2017, Qq51, 59

16 Jo Johnson [oral evidence](#) to S&T Committee, 17 October 2017, Q34

In the meantime there is a potentially more immediate concern that the European Commission may continue to adhere to its earlier view that UK citizens would not be able to be in Horizon-2020 research teams after Brexit.¹⁷

10. In order to stem the uncertainty about our future involvement in EU research collaboration, the Government should give a clear commitment now to the UK's full participation in Horizon-2020 throughout the duration of the relevant projects and throughout the proposed Brexit implementation period. The Government should also unequivocally commit now to the EU's successor 'Framework Programme 9', or offer an alternative vision for future close collaboration on European research programmes on a similar scale. This would send the strong signal about our intentions to remain a full player in European research collaboration that is needed for us to continue to attract the best scientists and researchers after Brexit.

Industrial Strategy

11. The Industrial Strategy, according to the Green Paper in January 2017, is intended “to improve living standards and economic growth by increasing productivity and driving growth across the whole country”, and it listed ‘Investing in science, research and innovation’ as the first of its 10 ‘strategic pillars’.

12. The Green Paper highlighted an Industrial Strategy Challenge Fund (ISCF) and ‘sector deals’ to take forward innovation in particular areas. The criteria for making ISCF awards are that projects should have a potentially large, or fast growing global market; UK research and business capacity to meet market needs; significant potential social and economic benefits; and where government support will make a difference. The Government similarly told us: “We will select [ISCF] challenges based on their potential economic and social impact, focusing on where innovation is most likely to deliver a productivity boost for key parts of the economy, and where the UK has a distinct advantage or opportunity.”¹⁸

13. In 2017 around £1bn of NPIF funds had been earmarked for the ISCF, across seven areas: Life-sciences, Healthcare and medicines, Robotics and artificial intelligence, Clean and flexible energy, Driverless vehicles, Manufacturing and materials of the future, and Satellites and space technology.

14. The British Academy and the Campaign for Social Sciences have raised their concerns about what they saw as a lack of participation in that first round of the ISCF. Universities UK wanted the ISCF to take “a more multidisciplinary approach to funding research that recognises the contribution of a wider range of disciplines to the UK economy”.¹⁹ Alun Evans, the chief executive of the British Academy, highlighted the salience of the services sector, which accounts for four-fifths of the economy.²⁰ He thought the programme so far

17 European Commission website, [News for British applicants to Horizon 2020](#), 6 October, 2017; [Oral evidence Q12](#) [Prof Boyle]

18 Science and Technology Committee, [Industrial Strategy: science and STEM skills: Government Response to the Committee's Thirteenth Report of Session 2016–17](#) (September 2017)

19 Universities UK written evidence ([SBI028](#))

20 [Oral evidence Q2](#)

was “a bit scattergun and needs to be given more shape”.²¹ Some of those giving evidence to us said that they would welcome a clearer statement about the nature of the ISCF ‘challenges’.²²

15. The Green Paper highlighted the opportunity for industry to propose ‘sector deals’, listing five potential candidates, of which four have since produced proposals: *Life Sciences Industrial Strategy*, *Independent Review of the Creative Industries*, *Growing the Artificial Intelligence Industry*, and *the Made Smarter Review*.²³ The Green Paper explained that “deals will be driven by business to meet the priorities of business,” and could involve addressing regulatory barriers, promoting competition and innovation, working together to increase exports or working together to commercialise research. The Royal Society cautioned, however, that a sector-led approach should not just favour established technologies of major incumbent firms, but also supports disruptive innovation—“The ISCF challenge portfolio should include projects with different risk profiles.”²⁴ Professor Paul Boyle saw a need for a degree of risk-taking.²⁵ Professor Richard Jones wanted the ISCF to provide “a chair at the table that is occupied by the companies that are not here now but will be here in 20 years’ time”.²⁶

16. Our brief inquiry identified some uncertainty about the linkage between the ISCF and the sector deals initiatives. UK Research & Innovation (UKRI) explained that “ISCF challenges are often referred to in a sector deal, but the two can exist independently”. Indeed, UKRI highlighted that its “ISCF teams have been working very closely with government and industry teams developing related sector deals, and this is clearly shown in the close alignment with the sector strategies and reviews that have already been published.”

17. The Government, in the Budget or in its planned Industrial Strategy White Paper, should clarify the rationale for the selection of the ‘challenges’ on which the Industrial Strategy Challenge Fund is based and how these may evolve as the programme proceeds in future. The White Paper should lay out a coherent programme of planned ISCF themes and potential ‘sector deals’ that together make the overall direction of travel for the industrial strategy unambiguous.

Place-based policy

18. The Green Paper envisaged “a framework to build on the particular strengths of different places and address factors that hold places back—whether it is investing in key infrastructure projects to encourage growth, increasing skill levels, or backing local innovation strengths.” It would have “recognition of the importance of place at its heart.” It noted that “there are regional disparities in how the public sector and companies spend money on research and innovation, with UK public R&D funding heavily focused on the ‘golden triangle’ of Oxford, Cambridge and London. As well as continuing to unleash the excellence of institutions, we need to build on the excellence in research and innovation that exists in other parts of the country too, and ensure that capital, institutional influence

21 [Oral evidence](#) Q13

22 [Oral evidence](#) Q22

23 [Oral evidence](#) Q24 [Rebecca Endean]

24 Royal Society written evidence ([SBI026](#)); [Oral evidence](#) Q3

25 [Oral evidence](#) Q20

26 [Oral evidence](#) Q20

and government attention is targeted there effectively.” The science minister recently explained that “where we have productivity gaps in this country, it is associated with weakness in R&D: We want increased R&D expenditure to drive greater productivity in more parts of the country.”²⁷

19. The extra funding for science and innovation in the 2016 Autumn Statement—£4.7bn over four years, rising to £2bn a year—included funding for the ISCF.²⁸ Other awards within the National Productivity Investment Fund were for new homes, transport networks and fibre/5G connections, which have critical importance for place-based policies.

20. In 2015 the Government initiated a process of Science & Innovation Audits, which, the Government told us, identify “self-selecting local consortia to come together to analyse the economic potential of their selected technological themes and chosen geography.”²⁹ Our predecessor Committee concluded in March 2017 that the Audits have focused on mapping the UK’s existing scientific strengths, but not where innovation and technology transfer was being held back. Gap analysis had uncovered weaknesses within existing sectors, rather than identifying where new sectors needed to be developed.³⁰

21. In July 2017, the Council for Science & Technology wrote to the Prime Minister with recommendations for how to harness the role of science and technology to deliver economic benefits that are shared across the UK.³¹ It noted that the productivity of British industry varies considerably by sector and by region—highlighting that London is around 75% more productive than the North East.

22. Jo Johnson emphasised to us recently that “We are keen to ensure that, through smart specialisation, we identify areas of excellence in other parts of the country—they are well known already, in many cases—and that they are properly supported. We must continue to fund excellence and not spread resources in such a way that finite amounts of money are duplicated inefficiently.”³² It was also clear from those who gave evidence to us that place-based policies needed to focus primarily on developing ‘excellence’.³³ The CST was similarly clear that “the UK’s international strengths in basic science are founded in its support for ‘excellent’ activities Excellence should remain the basis for funding research in the UK.”³⁴

23. It is also clear that “without the presence of local research excellence and absorptive capacity within the local business community, place-based research and innovation interventions are much less likely to result in a significant, positive economic impact in that area.”³⁵ Professor Boyle from Universities UK saw scope for “bringing clusters of universities together to help fund and support businesses”.³⁶ There is nevertheless a

27 Jo Johnson [oral evidence](#) to S&T Committee, 17 October 2017, Q32

28 HM Treasury, [Autumn Statement 2016](#)

29 Science and Technology Committee, [Managing intellectual property and technology transfer: Government Response](#), HC 318 (September 2017)

30 Science and Technology Committee, [Managing intellectual property and technology transfer](#), Tenth Report of Session 2016–17, HC 755 (March 2017)

31 [Letter from Council for Science and Technology to the Prime Minister](#), July 2017

32 Jo Johnson [oral evidence](#) to S&T Committee, 17 October 2017, Q33

33 [Oral evidence](#) Qq46–50

34 [Letter from Council for Science and Technology to the Prime Minister](#), July 2017

35 [Letter from Council for Science and Technology to the Prime Minister](#), July 2017

36 [Oral evidence](#) Q4

debate about whether excellence follows funding or funding follows excellence. Some of our witnesses acknowledged that changing the geographical allocation of science funding can itself draw talent to those areas.³⁷

24. Tackling our productivity gap will depend on a widespread geographical contribution to industrial development, especially including areas of the country beyond the south-eastern ‘golden triangle’. Place-based research and innovation interventions should be extended, but these must look to build on existing strengths in specific locations. When considering major new research institutions, the Government should actively consider locating them outside the ‘golden triangle’ to help support growth in lower-productivity areas and to help maintain employment in those areas. The Treasury should work with other departments to coordinate the ISCF with other elements of the National Productivity Investment Fund to ensure infrastructure planning takes account of the need for a wider geographical distribution of science and innovation centres of excellence.

25. We support the CST’s recommendations that the Government work with UKRI to create and promote a single accessible map of local science, technology and innovation assets, subsuming the data from the existing ‘Science and Innovation Audits’.

26. We want the Government to establish a place-based fund for supporting a geographically more dispersed science and innovation footprint. The Government should closely examine the CST’s proposal for an ‘Innovation and Growth Place Fund’, delivered by UKRI, to encourage regional economic development “based on genuine pockets of scientific excellence”.

Innovation-support

27. The Industrial Strategy Green Paper noted a number of innovation support measures that might be adjusted or which were being reviewed—practices in universities’ Technology Transfer Offices, the Small Business Research Initiative (SBRI); a possible expansion of the Higher Education Innovation Fund (HEIF) or of Knowledge Transfer Partnerships; and a “review of government and research council laboratories and their potential to drive local economic growth”.

28. In March 2017, our predecessor Committee highlighted areas where the Government could assist in the technology transfer process, and how businesses and universities could do more to commercialise the results of their research work. It highlighted areas where the Government could assist in the technology transfer process, for example through the SBRI, which funds the development of technology solutions to meet specific government needs, either for Government departments’ own requirements or to meet policy challenges.³⁸ The Government acknowledged to our predecessor Committee that the SBRI had yet to reach its full potential.³⁹ The expanded SBRI budget of £200m for 2014–15 was not met, and many Government departments were not using SBRI at all.⁴⁰

37 [Oral evidence](#) Qq46–50

38 Science and Technology Committee, [Managing intellectual property and technology transfer](#), HC 755 (March 2017)

39 Science and Technology Committee, [Managing intellectual property and technology transfer: Government Response](#), HC 318 (September 2017)

40 Science and Technology Committee, [Managing intellectual property and technology transfer](#), HC 755

29. When the Prime Minister announced the Government review of the SBRI, she highlighted how effective a ‘Small Business Innovation Research’ scheme had been in the United States — “There, strategic use of government procurement not only spurs innovation in the public sector, it gives new firms a foot in the door”.⁴¹ David Connell undertook that review of the UK’s SBRI for the Government, but his findings (and the Government’s response) have yet to be published.

30. Some of our witnesses raised a concern about the relative effectiveness of particular innovation support measures. When David Connell gave evidence to our inquiry, he criticised a Government focus on the ‘supply’ side of university/industry collaboration, rather than the ‘demand’ side. The Industrial Strategy Commission also recently concluded that policies have focused too much on the supply-side, and that Government should now focus more on driving the demand for innovation.⁴² Through Government procurement, the Government could be a ‘lead customer’ for new technologies as they are developed. Our predecessor Committee had similarly complained that the Government’s efforts had “disproportionately focused on the ‘supply’ of commercialisable research by universities, rather than on the level of ‘demand’ from businesses”.⁴³

31. David Connell saw the SBRI as the principal example of demand-side support. On the supply side, he criticised R&D Tax Credits as costly, at around four times what BEIS spends on R&D grants to businesses.⁴⁴ The science minister told us that R&D Tax Credits were now worth £3bn, and supported private sector investment in R&D of £23bn.⁴⁵ And TechUK and others saw the scheme as “valuable”.⁴⁶ But Mr Connell explained that since 2001, net business R&D spending, after deducting tax credits, has actually decreased by some 14% when measured as a percentage of R&D —more even than the cost of the R&D Tax Credit programme.⁴⁷

32. David Connell highlighted the benefits of ‘soft start-ups’, where “expertise, finances and reputation developed over a period of years through companies undertaking paid contracts for customers before developing and marketing their own proprietary products and accelerating growth.” In contrast, he believed, “university research spin-outs tend to adopt a model that is much more dependent on venture capital from the start. Even when a company succeeds technically, this is nearly always followed by it being sold to a larger corporation, often based overseas. This is usually before the business has moved much beyond the R&D stage, so further growth is truncated or worse.”⁴⁸ The Treasury’s recent consultation on ‘patient capital’⁴⁹ saw pension funds as a potential untapped source of such capital.⁵⁰ UK defined-benefit pension funds hold around £1.3trn of assets but tend to invest very little in patient capital, with overseas institutions appearing to invest more

41 CBI annual conference 2016: [Prime Minister’s speech](#), 21 November 2016

42 [Final Report of the Industrial Strategy Commission](#) (November 2017); [Oral evidence](#) Q13

43 Science and Technology Committee, [Managing intellectual property and technology transfer](#), HC 755

44 David Connell, [The need for customer-pull in innovation policy](#) (February 2015)

45 Jo Johnson and Sharon Ellis [oral evidence](#) to S&T Committee, 17 October 2017, Qq27, 28

46 [Oral evidence](#) Q46 [Tom Morrison-Bell]

47 David Connell, [The need for customer-pull in innovation policy](#) (February 2015)

48 David Connell, [The need for customer-pull in innovation policy](#) (February 2015)

49 ‘Patient capital’ is long-term investment in innovative firms, which may require substantial investment or timescales before a financial return is made.

50 HM Treasury, [Financing growth in innovative firms: Consultation](#), August 2017

in UK venture capital funds than UK pension funds. There is a debate about whether this is the result of a perceived over-interpretation of the legal responsibility of pension fund trustees to act ‘prudently’.

33. The SBRI’s “phased approach concentrates funding on the most promising projects and it is the only UK innovation scheme that gives early stage companies 100% funding in amounts large enough to make a difference to their prospects.”⁵¹ David Connell wanted a central (rather than departmental) fund for the SBRI, with a central administration to encourage more widespread departmental participation. He saw NHS England as a role model in its use of the SBRI.⁵²

34. A ‘Connecting Capability Fund’ has been introduced to support collaborations between universities and to increase opportunities for commercialisation of their research. The High Value Manufacturing Catapult told us:

“One of the best ways of developing other clusters is by establishing Catapult centres with world-class teams doing specialised R&D for their customers, linked to some kind of inherent strength within the area—it could be a university, it could be past industries—at the same time as having policies such as SBRI, to increase the demand for innovation through contracts and help breed Catapult spin-off companies.”⁵³

David Connell also wanted greater focus on Catapults.⁵⁴

35. On another scheme, the Higher Education Innovation Fund, Universities UK told us that they would support greater spending on HEIF, to £250m a year—a £50m increase on current funding.⁵⁵ Innovate UK highlighted how its system of loans, rather than grants, to businesses encouraged a meaningful commitment from industry because it had to put forward funding of its own.⁵⁶

36. The Government should initiate now a fundamental assessment of the balance of funding across the many Government innovation support initiatives, to feed into the Industrial Strategy White Paper and its further iterations. The Government should without delay publish David Connell’s review of the SBRI along with its response, to feed into that fundamental assessment. The SBRI needs a Government-wide impetus, with a central fund and management, and with all departments strongly encouraged to take advantage of an enhanced budget for the scheme.

37. The Government should also use the Budget to consider how the R&D Tax Credit system might be better targeted — for example to support place-based policies and improve R&D investment in specific regions.

Balance of spending and the science budget

38. The new UKRI organisation, already operating in shadow form before its official formation in April 2018, is in a pivotal position to address the issues we highlight in this

51 David Connell, [The need for customer-pull in innovation policy](#) (February 2015)

52 [Oral evidence](#) Q84

53 [Oral evidence](#) Q68

54 [Oral evidence](#) Q68

55 Universities UK written evidence ([SBI028](#))

56 [Oral evidence](#) Q83 [Dr Ruth McKernan]

letter—notably the structure and overall coherence of the ISCF (which it administers) and place-based initiatives. It will also be a key player in advising ministers on the balance of funding for the different areas of science research and the balance between research and innovation.

39. The Green Paper compared the balance of research funding in the UK with our competitors, noting that “We have a challenge in translating our leadership in global research into commercial outcomes—a longstanding weakness relative to other countries”. The High Value Manufacturing Catapult believed that if the current 10:1 ratio between science funding and innovation funding changed to say 80:20 it would “help to deliver a stronger conveyor belt of ideas flowing from the research base into commercial successes that boost the UK economy”.⁵⁷ Tom Thackray from the CBI thought that “We should consider whether [the 10:1 ratio] is the right split, and whether there are nearer-to-market interventions that are more effective”.⁵⁸

40. Sir Mark Walport, the CEO-designate of UKRI, told our predecessor Committee in January 2017 that “There is opportunity to expand the innovation funding. That must not be done at the expense of the research base, but when there is new funding available there is the opportunity to change the balance slightly.”⁵⁹

41. But, as Sir Mark indicated, any such rebalancing is predicated on the overall funding pot available. Funding will also be needed for further rounds of the ISCF programme and reacting positively to further ‘sector deal’ proposals. Funding will make possible the sort of place-related reforms envisaged by the Council for Science & Technology, as well as any extension of the SBRI. And a well-funded science base will help maintain the UK’s position as an attractive collaborative partner, post-Brexit (the Green Paper noted that “other countries have been increasing their investment in research and development in relation to GDP”). The science/ISCF budget increases announced in Autumn Statement 2016, along with the more recent commitment to increase the UK’s R&D spend as a percentage of GDP, are essential pre-requisites for these objectives.

42. Our predecessor Committee, before the 2015 Spending Review, called for a “roadmap” for increasing public and private sector science R&D investment, taken together, to 3% of GDP, from a figure of only 1.7%.⁶⁰ That Spending Review set a science budget that was stable in real terms (in place of the previous ‘cash flat’ settlement) through the addition of a new Global Challenges Research Fund (which also counts against the UK’s Official Development Assistance spending obligation). The extra £2 billion a year by 2019-20, made available in the 2016 Autumn Statement, brings a welcome real-terms increase in the science budget. The science minister has highlighted that this is “the biggest increase in science spending in 40 years, effectively pencilling-in a 20% uplift in public R&D for the period to 2020-21. That will get us up to about 1.8% of GDP”.⁶¹ But, as the previous Committee put it, that should be regarded as “a down-payment on a trajectory for increasing R&D investment” to a 3% of GDP target.

57 High Value Manufacturing Catapult written evidence ([SBI0033](#))

58 [Oral evidence](#) Q77

59 Sir Mark Walport [oral evidence](#) 25 January 2017, Q60

60 Science and Technology Committee, [The science budget](#), First Report of Session 2015–16, HC 340 (November 2015)

61 Jo Johnson [oral evidence](#) to S&T Committee, 17 October 2017, Q27

43. Against that background, **the Government's recent commitment to meet the current OECD average for investment in R&D—2.4% of GDP—within ten years, with a longer-term goal of 3%, is welcome.** But, as the Campaign for Science & Engineering⁶², TechUK⁶³, the Royal Society⁶⁴ and others pointed out, the Government has yet to share details of a 'roadmap' towards meeting those milestones that researchers and businesses need. The Government has not, for example, given its assessment of the likely multiplier-effect on business R&D spending from any increases in public expenditure (in the past, the ratio has been 2:1 between private and public spending⁶⁵). Also, a significant proportion (possibly half⁶⁶) of business R&D expenditure comes from overseas, and there may be uncertainty about this future source of investment after Brexit—including uncertainty about whether that will grow or decline.

44. But a further uncertainty, and one that the Government could control, is the future trajectory of Government R&D spending. The £2bn a year addition to the science budget, announced in 2016, will raise Government R&D spending in 2020-21 to £10.8bn, or 0.57% of GDP.⁶⁷ If the business sector responds by increasing its R&D spending in line with the 2:1 ratio, it would increase overall R&D by 0.2% of GDP, increasing overall R&D to 2.0%. Securing the further leap to the 2.4% target might need a further £2.4bn increase in the science budget (giving a rise of 0.13% of GDP), with business providing the other £4.8bn (0.27% of GDP). Professor Alun Evans believed that “we are going in the right direction towards 2.4%: It would need a step change to move towards 3%.”⁶⁸

45. **The Government should use the Budget to signal that a further science budget uplift will be needed over the next 10 years of at least a further £2.4bn to help deliver its 2.4% of GDP target. A start on such an increase should be made within the current Spending Review period, and announced—or at least signalled—in the forthcoming Budget. It would be a mistake to leave such an uplift to the latter stages of the 10-year target period, because (a) it would weaken the signal that the Government means to deliver also on its larger 3.0% target soon after, (b) businesses and overseas investors will have a lead-time in responding to public-sector expenditure rises, and (c) an early announcement of an enhanced science budget would signal the Government's commitment to a well-funded post-Brexit science landscape.**

I am copying this letter to Business Secretary Greg Clark MP, and to the minister for science Jo Johnson MP.

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Chair

14 November 2017

62 CaSE written evidence (SBI016)

63 [Oral evidence](#) Q63

64 Royal Society written evidence ([SIB026](#)); [Oral evidence](#) Q3

65 [Oral evidence](#) Q6

66 [Oral evidence](#) Q6 [Prof Richard Jones]

67 Royal Society etc, [Investing in UK R&D](#) (November 2017)

68 [Oral evidence](#) Q9