

August 22<sup>nd</sup> 2017

Letter to members of the Council for Science and Technology

- For the attention of Prof Dame Nancy Rothwell

- Cc Prof Sir Mark Walport, Gareth Davies, Jenny Dibden, Stian Westlake, Rebecca Endean

By email to Alan Pitt: alan.pitt@go-science.gsi.gov.uk

Dear Nancy and members of the Council for Science and Technology,

Thank you for your very helpful letter. We are setting out here our response which we trust will demonstrate how the Industrial Strategy Challenge Fund (ISCF) challenges, as they have now been refined, will fit within the Government's modern Industrial Strategy, building on many of the points you make.

Since we met, UKRI Chief Executives have worked closely with colleagues in BEIS, Industry Councils, the Royal Society and Academies and thought leaders across industry who are building sector deals. In sum, we now have a much clearer idea of how the Industrial Strategy Challenge Fund aligns with the Government's emerging Industrial Strategy.

We understand that the Government's Industrial Strategy White Paper will propose to improve productivity, raise earning power and increase wellbeing across the whole of the UK. It is expected to be delivered in the autumn and will have five themes; business, people, innovation, places and infrastructure. The ISCF challenges aim to drive business and innovation and should, as a collective, also link into and deliver positive impacts on infrastructure, people and place. In terms of place, consideration of the potential that each ISCF challenge has for improving productivity and economic growth across less well served parts of the UK (whether through investments made or the benefits arising), will be important.

While UKRI can't attempt to cover all aspects of the Industrial Strategy with the ISCF, we will naturally ensure alignment with other significant initiatives, including the 'BetheBusiness' campaign and sector deals and there will be clear links with cross-cutting themes for all challenges. Each challenge will also specifically consider other levers, such as changes in regulation and standards, that will help delivery and will need be considered across Government and in conjunction with sector deals. The different policy levers that Government plans to bring together to address a challenge will be outlined in the White Paper.

Skills are another area where it will be important to ensure links to emerging sector deals and the Industrial Strategy more broadly. As challenges are refined they will include a section on skills.

The 11 challenges currently in contention for funding through the ISCF have been assessed using the following five criteria: a) Be business-led in an area of existing UK strength; b) Take advantage of our research depth and expertise; c) Be a clear opportunity for growth with a sustainable global market and contribution from industry; d) Have validated evidence that Government intervention is necessary and of strategic importance to the UK and e) Solving each challenge should catalyse productivity growth. These criteria align with those being

considered to set the strategic 'missions' in the Industrial Strategy and focus on boosting productivity. The challenges, if solved, should drive economic growth and productivity, with ISCF investment providing the much needed catalyst.

In developing the second wave of ISCF challenge proposals, we recognise that the first three challenges were largely manufacturing in nature (production of batteries, innovative medicines and robots). We are now concentrating more on services, since 80% of the UK economy derives from the **services sector** including financial, accounting and legal services, creative industries and communications. In this category, the UK has a strong global presence. Services are an established sector very much at risk from disruption due to the application of emerging digital technologies, indeed many sectors including the automotive and aerospace industries are being reconfigured as service industries. If we don't transform to maintain our lead, others will. We have several proposals in a range of sectors where delivery can help protect the strong service economy. The challenges in this category (still subject to refinement) are to:

- Increase the UK's share of the global business and financial services market from ~13% to >15% by delivering real-time, predictive, personalised and tailored services, to be delivered both locally and globally.
- Double the revenues of UK-based live entertainment businesses and increase their audience numbers five-fold within the next 5 years by deploying new technologies.
- Commercialising the value of space data by establishing a global data refinery, guaranteeing future data security by assuring assets of core UK infrastructure, to ensure the UK space industry captures 10% of the global market by 2030.

The use of digital and AI technologies to transform some manufacturing sectors to become a through-life, integrated service offers significant opportunities and would see digital companies providing services to manufacturers to help them be more productive and pivot their business models. This, and other aspects, are being developed as part of the 'Digital Manufacturing' challenge.

The UK has a particular strength in the **healthcare sector**, derived from a strong legacy of biomedical and social research. Three challenges that reflect the opportunity to both manage the health of our nation, and deliver the new products and services globally are:

- Delivering a step change in early diagnosis and precision treatment through better use of health data.
- To halve time off work and hospitalisation of mental health sufferers by improving diagnosis, monitoring and treatment using digital health technologies.
- To double the market in new consumer products and services for the frail elderly, delaying the need for institutional care and improving quality of life and independence.

The huge opportunity to build the **low carbon economy** and reduce environmental impact in places where people live and work has resulted in three challenges that impact the cost of housing, energy and food. These are:

- Manufacturing better buildings to build safer, healthier, sustainable and more affordable places to live and work.
- Prove that 'internet of energy' approaches, intelligently joined up locally, can turn cleaner energy into low cost energy and create the high value jobs that underpin a prosperous society.

- Boosting productivity of the food sector from 'farm to fork' by 30% while halving the environmental impact.

A proposed challenge on quantum technologies is also currently in development, recognising this technology could be applicable across a number of other challenge areas proposed. Also of note, there is no specific challenge on AI, machine learning or data; these disciplines are a horizontal theme, present in all of them.

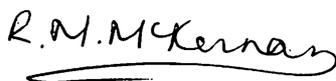
We also note the comments included in your letter regarding risk appetite and we share the view that a 100% success rate would suggest the level of ambition had been too low for the ISCF. It will be important that there is a broad risk appetite across the portfolio of challenges as well as within elements of each specific challenge.

Our approach adopts many of the principles used by the DARPA model, will require an empowered Challenge Director, supported by a group of advisors, who can draw on all the expertise of UKRI and UK businesses. We recognise this is a new approach and are grateful for CST's advice on how these roles can best be developed and supported. We can reassure CST that the points made around governance are already in hand.

As part of the announcements in November, we also intend to announce an Expression of Interest (EOI) for Wave 3, which will take place in early 2018. The EOI will launch in January/February and will invite interested parties to submit ideas for future challenges. An EOI would run for 3 months closing in March/April and selected challenges would be invited to go into a deep dive process starting in June, with funding starting in 2019/20.

At the end of August refined 4-page descriptions for each of the ISCF challenges, supported by associated detailed evidence, metrics and analysis (related to specific assessment criteria) will have been prepared. We propose that we share these with the CST in early September and attend the CST meeting on September 13<sup>th</sup>/14<sup>th</sup>, along with Alex Jones (BEIS lead for the Industrial Strategy), to discuss progress and gather further advice.

With best wishes,



Dr Ruth McKernan CBE  
Chief Executive  
Innovate UK



Prof Melanie Welham  
Chief Executive  
BBSRC