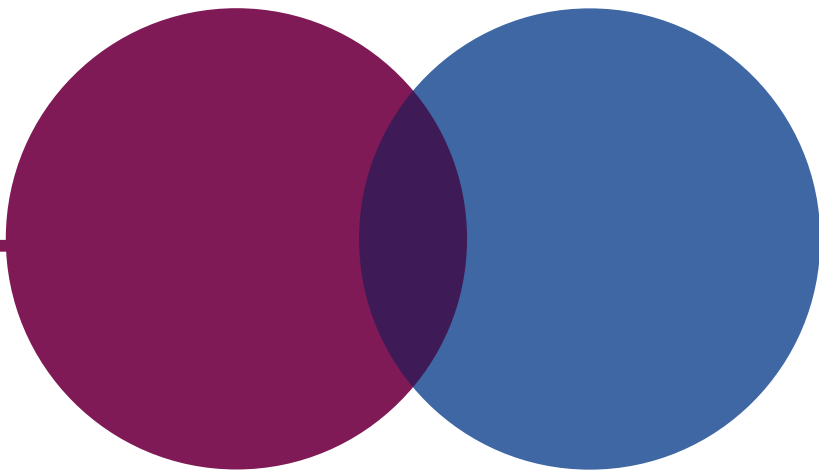




National Audit Office



UK Research and Innovation's management of the Industrial Strategy Challenge Fund

UK Research and Innovation
and the Department for Business,
Energy & Industrial Strategy

REPORT

**by the Comptroller
and Auditor General**

**SESSION 2019–2021
5 FEBRUARY 2021
HC 1130**

Key facts

£3.0bn

budget of the Industrial Strategy Challenge Fund (the Fund) over an eight year period 2017-18 to 2024-25

£1.2bn

expenditure from the Fund since 2017-18 as at January 2021

24

industrial and societal issues ('challenges') addressed under the Fund as at January 2021

1,613 number of projects supported by the Fund by January 2021

£567 million funding to date contributed by industry to projects alongside public funding

43 and 72 weeks time it took to select and approve challenges for the second and third Waves of funding respectively (in the first Wave the funding process followed a different approach)

14% underspend against the Fund's budget for 2019-20 (in 2017-18 and 2018-19 underspend was 5% and 7% respectively against the budget)

24 weeks the average length of time (including serving notice period) it took in 2019-20 to appoint a permanent Challenge Director for the duration of a challenge

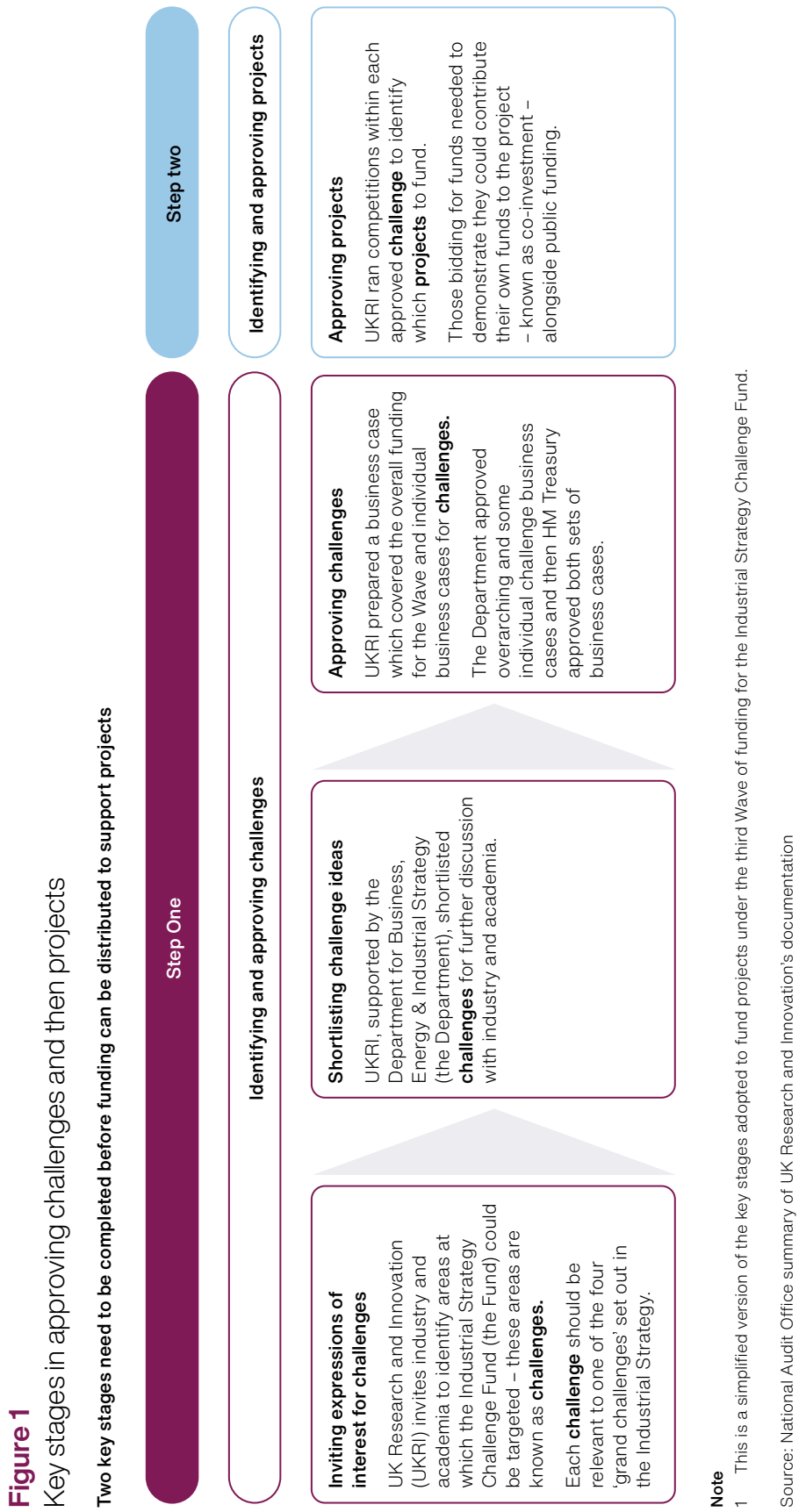
Summary

1 The Department for Business, Energy & Industrial Strategy (the Department) has overall responsibility for the government's spending on science, research and innovation. One of its objectives is to deliver the UK's Industrial Strategy by, among other things, promoting investment in science, research and innovation to make sure the government's ambition of the UK becoming the 'most innovative country' is fulfilled.

2 Established by the Department, the Industrial Strategy Challenge Fund (the Fund) supports the aim set out in the government's Industrial Strategy to raise long-term productivity and living standards. An "industry-led" programme, announced in late 2016 and funded from the National Productivity Investment Fund (NPIF) introduced by HM Treasury, the Fund aims to 'tackle [...] major industrial and societal challenges' through supporting four 'grand challenges' outlined in the Industrial Strategy (future mobility; clean growth; artificial intelligence and data; and the ageing society). The Fund contributes to the government's aim for the UK to spend 2.4% of its gross domestic product on research and development (R&D). Recently, the government has looked to the Fund to contribute to its aim to achieve net zero carbon emissions by 2050. The government is also considering how its 'levelling up' agenda – whereby it aims to create opportunity for everyone in all regions and address disparities in economic and social outcomes – will apply to R&D and innovation spending across the UK.

3 The government's approach to distributing the Fund has changed since it was introduced. Most recently, UK Research and Innovation (UKRI), a non-departmental public body reporting to the Department and which is responsible for the Fund, has invited potential bidders from business and academia to identify important societal and industrial 'challenges' faced by the UK that might merit financial support from the Fund. Each challenge is intended to contribute to one of the four grand challenges identified in the Industrial Strategy. Once a challenge is approved by ministers, organisations are invited to bid for individual projects that will contribute to that challenge. Those bidding need to demonstrate they can contribute their own funds to the project - known as co-investment - alongside public funding. The selection process, as it now exists, is outlined in **Figure 1** overleaf. By 2019-20, UKRI and the Department had overseen three rounds of funding, known as Waves 1, 2 and 3.¹

¹ Wave 1 was funded in two stages (Wave 1a and 1b). In Wave 1a, to get the Fund up and running, the research councils and Innovate UK identified fundable projects from recently completed competitions which matched Industrial Strategy ambitions. Wave 1b followed the challenge structure used in Waves 2 and 3. Due to the lack of readily available data on Wave 1a projects these have not been included in some of our analyses.



4 Current challenges range from supporting the UK's development of low-carbon technologies, to looking to support the better detection of disease and to identify new ways to tackle cyber security threats. Individual projects within the challenges range from the mass production of vaccines, support for new approaches to constructing houses, the development of batteries required for electric vehicles and the establishment of a national satellite test facility.

5 The Department has set UKRI five objectives for the Fund, to:

- increase UK businesses' investment in R&D, while also improving R&D capability, capacity and technology adoption;
- increase multi- and inter-disciplinary research;
- increase engagement between academia and industry on targeted innovation activities;
- increase collaboration between new small companies and those that are established; and
- increase overseas investment in R&D in the UK.

6 By January 2021, the Fund was supporting 1,613 projects contributing to one of the 24 approved challenges, each linked to one of the four grand challenges.² UKRI has so far spent around £1.2 billion of the eight-year budget of £3.0 billion funding projects. To date, industry has contributed £567 million against the Fund's co-investment target of £2.8 billion. UKRI currently forecasts it will meet this target over the life of the current challenges.

7 UKRI, established in 2018 (bringing together the seven research councils, Innovate UK and Research England), has overall responsibility for the Fund. The Department scrutinises the affordability of proposals and then approves spending from the Fund. It also advises ministers on policy alignment between Fund challenges and Departmental objectives such as the Industrial Strategy. HM Treasury scrutinises and approves, from a value for money perspective, business cases (a condition of funding from the NPIF).

² The Industrial Strategy Challenge Fund is currently made up of what UK Research and Innovation (UKRI) describes as 21 challenges and three programmes. Programmes do not follow the challenge model so do not have a Challenge Director and are monitored and evaluated differently. This is due to the fact that in Wave 1, UKRI's predecessors were required to spend the money quickly and provided funding to investment-ready programmes. We refer to both as challenges in this report.

Scope of this report

8 The Fund has a number of characteristics which can make the assessment of its value for money challenging. It is looking to support innovative projects, some of which by their nature will fail; the impact of its support may only become obvious over the long term; and it is looking to contribute to a broad range of objectives. Regardless of these challenges, we consider that there are certain key elements which need to be in place to support the achievement of value for money – clear objectives, an approach which aligns resources with the achievement of these objectives, and consideration of progress and performance.

9 This report examines whether the Fund has been set up in a way likely to optimise value for money. The report examines:

- the establishment of the Fund, in particular whether it has attracted sufficient good-quality bids, whether the selection processes have been efficient and whether the budget is managed effectively (Parts One and Two); and
- the approach to monitoring and evaluating the Fund's performance, as well as its performance to date (Part Three).

10 Full details of our scope and audit approach are set out in Appendices One and Two.

Key findings

Establishment of the Fund

11 The Fund is an ambitious programme, and government is looking for it to contribute to an increasing number of objectives. The Fund contributes to addressing the government's four grand challenges set out in its Industrial Strategy. To do so, it has established 24 challenges, each of which has a set of objectives. Under these, UKRI is funding and then maintaining oversight of 1,613 projects. The government is also looking to the Fund to contribute to its target for the UK to spend 2.4% of its gross domestic product on R&D and, more recently, to its ambitions around net zero. It is also considering the Fund's role in contributing to its 'levelling up' agenda (paragraphs 1.5 to 1.9 and Figures 2, 3 and 17).

12 The Department and UKRI worked quickly to establish the Fund and attract sufficient interest from bidders. Since 2017, UKRI has received almost 2,700 bids for 61 competitions for project funding across 16 challenges. Of these, about one in four bidders – 699 – were successful. Almost 60% of the competitions received at least two bids for every project awarded funding. We found that, over time, UKRI has developed its approach to how it identifies challenges to focus more on the needs of industry and academia. Stakeholders we interviewed, including applicants and other organisations involved in promoting investment in R&D and innovation, were positive about, for example, the support provided to industry through the Fund (paragraphs 2.2 to 2.6 and Figures 5 and 6).

13 The Fund has succeeded in attracting winning bids from small and micro companies although larger companies accounted for a growing proportion of projects in the latest funding Wave.

Small and micro companies accounted for more than 40% of the project awards in both of the first two Waves. The third funding Wave, however, which started in 2019-20, saw a rapid increase in the proportion of projects awarded to large companies (from 20% to 29%) compared with the second funding Wave, and a rapid fall (from 44% to 31%), in the number of small- and micro-businesses winning funding. UKRI has found no evidence of in-built bias towards larger companies during the selection process. A number of factors are likely to be impacting on the number of smaller companies applying, including their awareness of the Fund, the time and effort required to apply and the requirement – increased for the third funding Wave – to bring co-investment (paragraphs 2.7 to 2.9 and Figure 7).

14 Funding awards have been distributed unevenly across the country.

By the end of March 2020 just over 63% of the funding awarded had gone to organisations registered in London, the South East and West Midlands. Of the total funding awarded, 44% had gone to organisations registered in London and the South East, mainly in the health and life sciences sector. The West Midlands had attracted another 19% of the awarded funding, mainly in the manufacturing and materials sector. Our analysis suggested that the geographical distribution of funding was not explained by the distribution of businesses undertaking R&D activities in the economy. To date, UKRI has not had an explicit objective to consider the regional balance in its awards. In July 2020, the government stated that it was considering how spending on R&D and innovation should contribute to its 'levelling up' agenda (paragraphs 2.10 to 2.12 and Figures 8 and 9).

15 Lengthy processes for agreeing challenges and then projects leads to delays in funding projects.

A balance needs to be struck between making sure proposals for challenges and then bids from prospective grant recipients are of sufficient quality and approved quickly. Overly long processes might delay the impact of projects and might deter applicants. We identified lengthy approvals processes at both key stages of the Fund – selecting and approving challenges and then selecting and approving projects (paragraphs 2.15 to 2.19 and Figures 1 and 10). For the third Wave of funding, for example:

- it took UKRI, the Department and HM Treasury 72 weeks to move from identifying ideas for new challenges (expression of interest stage) to the approval of those challenges; and
- UKRI then took on average 31 weeks to assess applications for project funding and then make an offer for funding to the applicant.

16 Grant recipients and stakeholders consulted by us consistently identified the lengthy approvals process as a potential deterrent to prospective applicants.

A number of factors contributed to the time taken to award funding, including capacity constraints in UKRI and a need in the early stages of the Fund to improve the quality of business cases submitted by UKRI to support ideas for new challenges. However, lengthy approval processes at both official and ministerial level in the Department and HM Treasury, carried out in sequence, have added to the time taken. Businesses and representative bodies told us they had concerns about the impact of these elongated approval processes (paragraphs 2.13 to 2.19 and Figure 10).

17 UKRI has faced difficulty recruiting staff to help administer the Fund. Having fewer staff than UKRI estimates is required to manage the Fund – could have an impact on a number of areas - such as its oversight and evaluation of performance. In 2019, UKRI estimated that its staffing to administer the second funding Wave was 40% under capacity. For the third Wave this had deteriorated further to around 60%, equating to approximately 42 full-time equivalents. More recently, UKRI informed us that the shortfall had improved with eight positions covering the Wave 2 and 3 challenges still vacant in January 2021. The appointment of Challenge Directors within UKRI is critical to setting the direction for and then successfully implementing each challenge. Since the start of the Fund, it took on average over 37 weeks to appoint permanent Challenge Directors for the duration of the challenge, although in 2019-20 this had shortened to 24 weeks.³ UKRI informed us that the delays were partly due to the difficulty of finding and hiring staff at an appropriate level who have a mix of science and industry experience. The recruitment is not delivering diversity at Challenge Director level, which is important given that diversity of thinking is likely to be important to the success of a Fund seeking to encourage innovative ideas. Out of 20 Challenge Directors at the end of August 2020, three were female (paragraphs 2.20 to 2.22 and Figure 11).

18 UKRI is underspending against the Fund budget, which may put pressure on future years' budgets. In total, by March 2020 UKRI had spent £1,024 million against the overall Fund budget to that point of £1,146 million (an 11% underspend). Delays in getting new challenges approved and up and running has had a knock-on impact on UKRI's ability to start spending on newly approved challenges. These delays are likely to push spending into the following years as commitments build up. This pressure, exacerbated by the impact of COVID-19 which will have slowed progress on some approved projects, may increase the risk of UKRI having to re-profile its future spending to fit within its annual budgets. UKRI and the Department are currently reviewing the Fund's multi-year budget profile (paragraphs 2.26 to 2.30 and Figure 12).

3 This analysis looked at the time taken until the permanent Challenge Director started in their role at UKRI. It includes the time taken for recruitment and the notice period for the appointee when leaving their previous role (if relevant).

19 UKRI and the Department reacted quickly to support COVID-19 related R&D whilst supporting other projects unable to progress as planned. In May 2020, the government announced that the Vaccines Manufacturing and Innovation Centre funded by the Fund would receive a further £93 million to accelerate its construction and to make sure a vaccine could be produced quickly and in large quantities. At the same time, UKRI agreed to re-profile £165 million from the current budget into future years for 20 challenges. Some businesses, particularly small- and medium-sized enterprises, struggled to meet the co-investment requirements due to the impact of COVID-19 on their operations. Some of those businesses have had to re-scope or pause work on their funded projects (paragraphs 2.31 and 2.32).

Monitoring performance

20 There is currently no clear link between the objectives set for the Fund and the performance of the Fund's projects, making it more difficult for UKRI to measure the long-term impact of the Fund as a whole. The five Fund objectives, set by the Department, focus on who receives support from the Fund, such as business and academic bodies, rather than the impacts projects may deliver (which are set at a challenge level). While UKRI reports performance against Fund objectives, no expectations or baselines were set at the start and reporting at Fund level does not focus on impact. UKRI is looking to enhance its evaluation of the Fund's performance against its objectives and to consider its wider social and economic impact. UKRI has, for each challenge, established 'benefit maps', which set out in detail the outcomes that the challenge is intended to deliver as well as how the projects supported by the challenge will contribute. It is currently piloting its approach to collecting performance data in this area for two challenges, with the aim of having this approach in place for all challenges by April 2022 (paragraphs 3.9 to 3.12).

21 UKRI's assessment of performance suggests projects and challenges are performing well although there has been some fluctuation over the last six months. Challenge Directors' most recent assessment of performance (as at January 2021) put 16 of the 24 challenges in the top two categories (meaning that performance was either in line with expectations or an issue which might have a negative impact on the challenge had been identified but could be mitigated). In June 2020, their assessment was that 12 challenges were performing at that level; by September 2020 this figure was 19. The fluctuating assessments over recent months have reflected, for example, the impact of COVID-19 on individual challenges. UKRI also monitors project progress. Considered against six criteria, such as cost and risk management, projects have consistently been classified as being on track to deliver their planned objectives, or having some scope for improvement to make sure that all objectives would be met. However, we have identified some limitations in UKRI's performance data (paragraphs 3.3 and 3.4).

22 UKRI's ability to generate meaningful performance information on the Fund's projects has, until June 2020, been hindered by its reliance on systems inherited from its predecessors. Until June 2020, UKRI was reliant on the manual compilation of data drawn from these systems, leading to sometimes incomplete and untimely management information which places constraints on its ability to monitor project performance efficiently and in a consistent manner. UKRI now has access to more timely information that draws directly from these different systems. Even so, the research councils monitor projects using different processes and systems compared to Innovate UK. For projects initiated by the research councils, some of the data are either not included at all in the routine management information or still have to be added manually (paragraph 3.5).

Conclusion

23 In the three years since the Fund – £3.0 billion of support to industry and academia to help solve the economy's and society's most complex issues – was introduced, UKRI and the Department have worked well to generate interest from industry and academia. Over that period, government has enhanced its engagement with industry to seek out challenges which might benefit most from taxpayer support.

24 UKRI's own assessment shows that the Fund's key components – challenges and projects – are broadly performing well. To sustain this position, the Department and HM Treasury, working with UKRI, need to place more emphasis on the outcomes and impact its funding secures at the Fund level. The increasing number of challenges supported by the Fund, each with their own objectives, and range of different objectives at Fund level risk obscuring priorities and will make the assessment of value for money in the longer term more difficult. UKRI, the Department and HM Treasury need to look again at the drawn-out process for selecting and approving challenges and projects, to ensure that good applicants are not deterred from putting forward bids.

Recommendations

25 We have identified a number of areas where UKRI has sought to learn lessons and improve its approach. For example, externally it has changed how it identifies challenges so that it is more focused on the needs of industry and academia. Internally, it has taken steps to develop more timely and accurate management information from the bodies which were brought together into UKRI. And its approach to performance assessment is evolving to consider the impact the projects it funds are achieving.

26 To support the next steps in the Fund's development we recommend:

- a UKRI, working with the Department and HM Treasury, should re-examine the arrangements for measuring the performance of the Fund**, in particular whether the array of current objectives provide a coherent direction and have sufficient focus on the impacts to be delivered from the money spent;
- b UKRI, working with the departments, should streamline the current arrangements for selecting new challenges to help shorten the time taken to arrive at decisions.** Lengthy approval timescales can have practical implications for applicants hoping for support, UKRI's ability to manage its budget effectively, and ultimately the delivery of impacts. UKRI and the departments should assess whether the right staffing capacity is in place in UKRI at the times needed and whether the approval processes in the departments could be shortened without undermining the rigour of the exercise;
- c In line with the government's ambition for R&D to support the wider 'levelling up' agenda, UKRI should examine the factors that may be driving the current geographical distribution of funding.** This might include issues such as awareness of the Fund across the UK, and the intensity of involvement in the Fund across the industrial sectors known to be investing in R&D and innovation, for example, arising through the choice of challenge funds; and
- d UKRI should review the impact of changes in its conditions for co-investment funding on the size of business applying for support through the Fund.**