

Country Study: UK

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Contents

Introduction.....	3
Organisations	6
UKRI.....	6
Innovate UK	7
Organisation evaluation	8
Reviews of TSB and Innovate UK	8
Reviews of Catapult Centres.....	9
Processes	11
Policy formulation	11
Policy evaluation	12
Recent policy evaluations.....	13
Industrial Strategy 2017.....	13
Plan for Growth and Innovation Strategy 2021.....	14
Content	15
Input Content	15
Industrial Strategy 2017.....	15
Plan for Growth and Innovation Strategy 2021.....	15
Policy document contents.....	16
Industrial Strategy 2017.....	16
Plan for Growth (2021).....	16
Innovation Strategy 2021.....	16
Pillars.....	17
Output Content.....	18
Good Practices.....	21
References.....	23

Introduction

The UK has a long history of industrial policies that can be traced back at least to Robert Walpole's 18th-century programme of subsidies and tariff protection to strategic industries, if not to 16th and 17th-century government-sponsored poaching of skilled artisans from Flanders (Chang, 2002; 2007). As Chang (2007) points out, the UK only implemented and became a champion of laissez-faire and free trade in the 1860s with the repeal of the Corn Laws after almost a century of active industrial policies that helped it become the strongest industrial power in the world at the time.

After the end of World War 2, in the 1950s, the UK introduced subsidies and nationalised several industries, followed by a power-sharing arrangement between government, businesses, and workers in the 1960s and 1970s. In the 1980s, with the rise of the free market, "laissez-faire" ideology (especially with the election of Margaret Thatcher in 1979), industrial policies diminished, although did not disappear, in the country. The dominant understanding at the time was that resource allocation should be left to "market forces", i.e., to the private sector. In the 1990s, some industrial policies were made, although these were of a "horizontal" or non-selective nature, often under the names of "competitiveness" or "productivity" policies (Norris & Adam, 2017; Wren, 2001; Bailey & Driffield, 2005). Active industrial policies have been regaining space in the country since the late 1990s. In 1997, for example, the Sector Skills Councils were established to provide key industries with support to generate core skills and increase productivity. The following year, the Regional Development Agencies were established, providing substantial funding for projects aimed at developing business efficiency and competitiveness, employment, skills, and sustainability in their regions (The National Archives, 1998). In the 2000s, this trend was further advanced with the establishment of organisations such as the Manufacturing Forum in 2004, which would become the Ministerial Advisory Group on Manufacturing (MAG) in 2008, and the Technology Strategy Board (TSB) in 2004, which ten years later would change its name to the current 'Innovate UK'.

Throughout the 2010s the move towards more active policies was intensified. Under Vince Cable's leadership, the Department for Business, Innovation and Skills (BIS) declared in 2012 a new sectoral approach to industrial strategy, in what some considered to be the return of UK industrial policy after 30 years (O'Gardy, Chakraborty & Cridland, 2012; House of Commons, 2017). This strategy initially focused on life sciences, energy, and aerospace. As part of the strategy, the British Business Bank was idealised and launched, a public procurement mechanism was created, and the Regional Development Agencies were substituted by the Local Enterprise Partnerships (LEPs) (O'Sullivan et al., 2013; BIS, 2012a; 2012b; 2013; HM Government, 2013; Cable, 2012).

In 2016, as one of the first acts of the new conservative government of Theresa May, BIS merged with the Department of Energy and Climate Change (DECC) to form the current Department for Business, Energy and Industrial Strategy (BEIS). This change signified a significant milestone as it explicitly established industrial strategy as a key component of government policy. It was also in the 2010s that an initiative was put forward to establish technology innovation centres across the country, which would later be renamed the Catapult Centres (Hauser, 2010; O'Sullivan et al., 2013).

The main policy of the new Department was to formulate and implement the Industrial Strategy, launched in 2017. The publication of an explicit Industrial Strategy can be seen as the result of a long process of gradual increase in UK government industrial policy activities since the 1980s.

This gradual movement towards more active policies has followed a global trend in the same direction largely as a response to several global events: i) the 2008 global financial crisis, which put in question the efficiency of unregulated market mechanisms; ii) the growing importance in international trade of China and other Asian nations who are avid users of active industrial policies; iii) the increased complexity and pace of innovation and the emergence and fusion of technologies with potentially disruptive effects known as “advanced manufacturing”, “Industry 4.0”, “Digital transformation”, “4th Industrial Revolution”, etc., with a growing understanding that private sector efforts alone are not enough to cope with these changes (Labrunie et al., 2020).

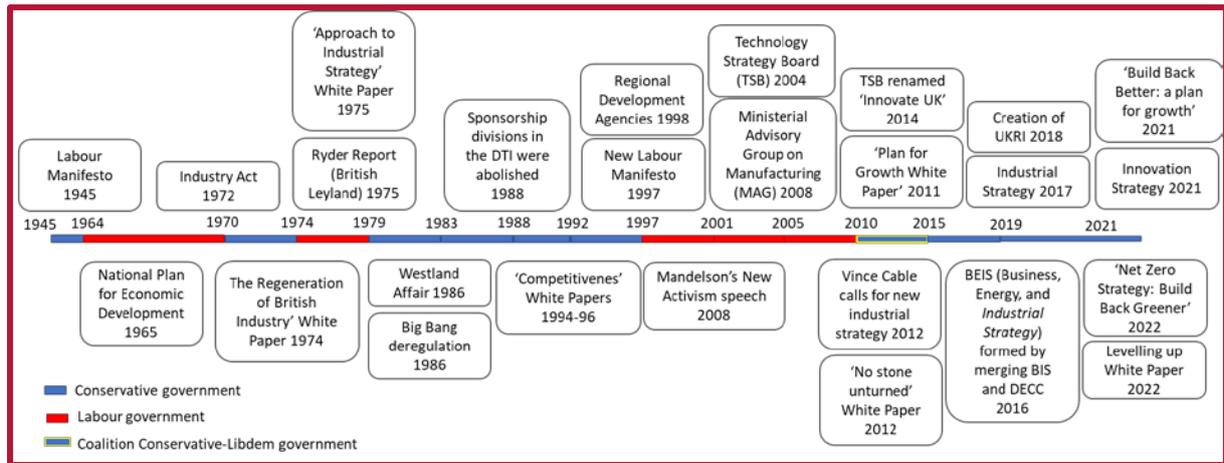
Most of the industrial policies of today, however, are considerably different from the 20th-century ones. First, they focus on innovation rather than on defending strategic and nascent industries (Soete, 2007). Second, they are much warier in intervening with market mechanisms (Labrunie et al., 2020). To mark such differences, the current interventions will be referred to as *industrial innovation policies*.

The current policy – put forward in two documents¹ published in 2021, “Build Back Better: Plan for growth” (HM Treasury, 2021) and “Innovation Strategy” (BEIS, 2021) – was proposed to build “on the best of the Industrial Strategy from 2017” (Sunak & Kwarteng, 2021). However, in practice, the new document has removed key aspects of the previous strategy such as sectoral and local policies (ISC, 2021), widespread consultation processes with the industrial innovation policy community (Coyle and Muhtar, 2021), and independent evaluation mechanisms (Haldane, 2021). At the same time, some suggest that it has kept existing flaws, such as committing to too many measures with little prioritisation (ISC, 2021). In terms of new organisations, in 2021, the government established a new Office for Science and Technology Strategy (OSTS) and a National Science and Technology Council (NSTC). In the same year, a new research funding body, the Advanced Research and Invention Agency (ARIA), modelled after the US Advanced Research Projects Agency (ARPA), was announced, and in July 2022 its CEO and Chair were appointed.

The timeline below highlights important publications and events in the UK’s national industrial innovation policy landscape.

¹ Other relevant recent strategies include the Net Zero Strategy – aimed at reducing Carbon emissions - and the Levelling Up White Paper – aimed at promoting regional development in the UK. Here we will focus on the Plan for Growth and Innovation Strategy as they are more directly related to industrial innovation.

Figure 1 – Timeline of important documents and events in UK industrial innovation policy²

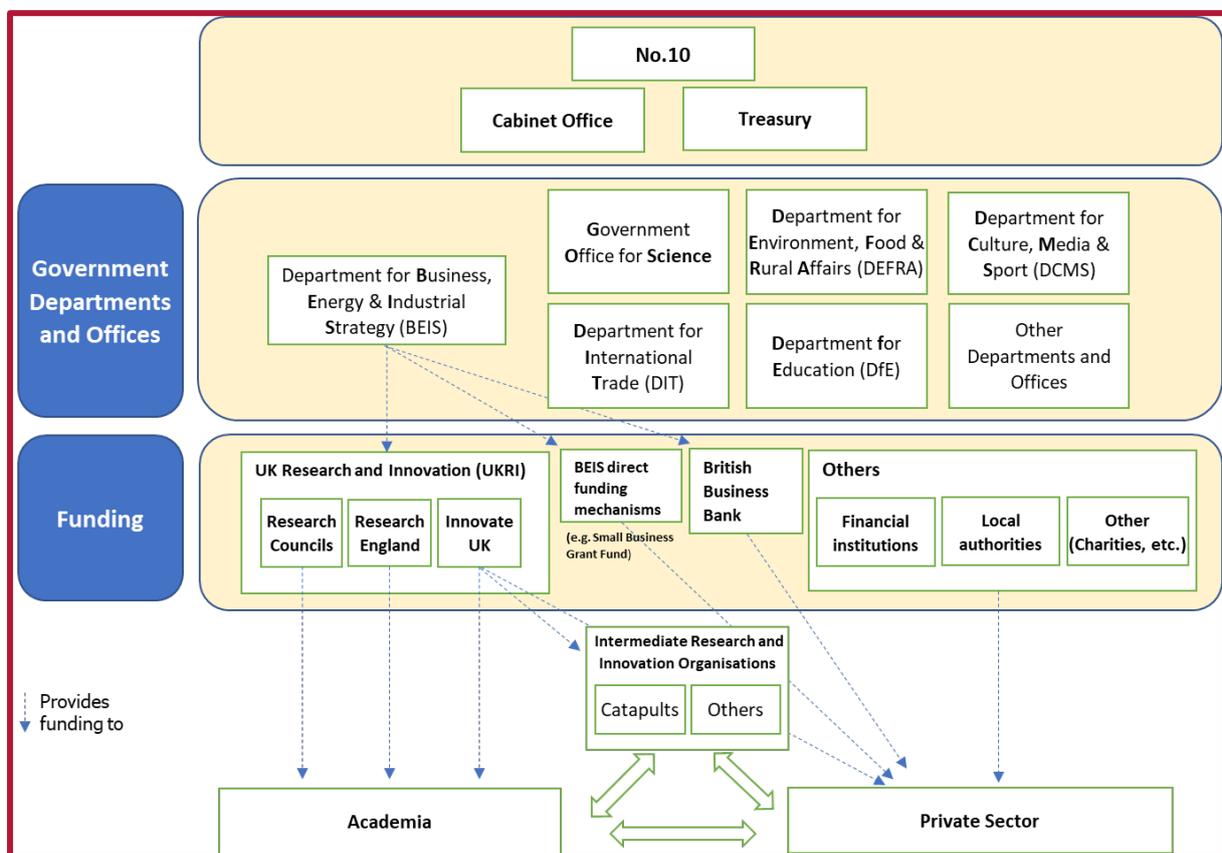


² Figure **Error! Main Document Only.** – Timeline of important documents and events in UK industrial innovation policy

Organisations

In the UK, organisations that have a central role in policymaking are the Prime Minister's Office (also known as No. 10), Her Majesty's Treasury (HMT), the Cabinet Office (a department responsible for supporting the prime minister and Cabinet), and BEIS. The first three are often referred to as the 'centre of government' and play a central role in determining policy direction (Norris & Adam, 2017). While No. 10 and HM Treasury have a prominent role in industrial innovation policy formulation, when it comes to policy implementation, BEIS is the main actor. Sponsored by BEIS, UK Research and Innovation (UKRI) is the main agency responsible for industrial innovation matters. Other Departments that play significant roles are the Department for International Trade (DIT), the Department for Environment, Food & Rural Affairs (DEFRA), and the Department for Education (DfE). Figure 2 below provides a map of key organisations involved in the implementation of industrial innovation policy in the UK.

Figure 3 – Map of organisations involved in industrial innovation policy implementation in the UK³



UKRI

Brings together seven disciplinary research councils, Research England – responsible for providing research and knowledge exchange funding to higher education institutions in the UK –, and Innovate UK, the UK's innovation agency. In addition to grant funding, UKRI also plays a crucial role in maintaining UK research infrastructure, funding postgraduate students (including 28% of UK PhD students in 2020-21), providing research funding for universities, and running innovation-related programmes that support thousands of business enterprises (BEIS, 2022)

³ Source: Policy Links Unit, IfM Engage; BEIS annual reports and accounts.

UKRI was formed in 2018 as the government's response to the 2015 Nurse Review – a report written by the president of the Royal Society, Paul Nurse⁴, who reviewed the UK research councils and recommended their merger to increase cross-disciplinary research and innovation (Nurse, 2015). Since 2018, it has successfully delivered between £7 billion and £8 billion of research and innovation funding annually, was key in operationalising the government's 2017 Industrial Strategy through several programmes (ISCF, Future Leaders Fellowships, SPF), played a crucial role on Brexit negotiations and contingency arrangements (such as the continued association to Horizon programmes), and was essential to providing a quick response to the Covid-19 pandemic (BEIS, 2022).

The history of Innovate UK and the Catapult Centres are useful to illustrate the process of organisation establishment and evaluation in the UK.

Innovate UK

Innovate UK has its origin in the Technology Strategy Board (TSB), founded in 2004 within the department of Trade and Industry (DTI). The TSB has its roots in the Innovation Review published by the DTI in 2003, and the Lambert Review. The Lambert Review was a report written by Richard Lambert (a prominent British journalist and business executive) and published by HM Treasury which made “a series of recommendations aimed at smoothing out the path between Britain's strong science base and the business community”. The objective of TSB was to advise the Secretary of State for Trade and Industry on business research, technology, and innovation.

In July 2007, the TSB became an arm's length, business-led, executive non-departmental public body (NDPB) sponsored and funded by the Department of Business, Innovation and Skills (BIS). It was required to act by a management statement and financial memorandum, had a governing board with representatives from business, research and innovation, and was run by a chief executive officer, a management team, and around 200 staff. In its first five years, it enabled around £2.5 billion of investment as a combination of its budget, funding matched by industry, and other partner contributions. In August 2014, the organisation adopted the name Innovate UK (DB, 2022), and in 2018 it was incorporated into UKRI together with Research England and the Research Councils (BEIS, 2022).

Catapult Centres

The Catapult Centres have their origin in a 2010 report commissioned by BIS from Dr Hermann Hauser, an entrepreneur who had been active in information technology since 1978. The Hauser review – as it became known –, recommended the establishment of Technology and Innovation Centres (Hauser, 2010). The recommendation was followed and in 2011 each centre received at least £10 million 'core' funding per year for five years from the TSB, with the intention that in the long-term the funding split would be: one-third 'core funding', one-third commercial funding, and one-third collaborative (public and private) R&D funding. Later in 2011, the Technology and Innovation Centres were renamed as 'Catapults'.

It can thus be perceived that the organisations that became central to the UK's industrial innovation policy were formed following the recommendations of commissioned reports from prominent individuals: Nurse Review - UKRI, Lambert Review – TSB/Innovate UK, Hauser Review - Catapults. This

⁴ In 2021, BEIS commissioned a second report from Paul Nurse, reviewing the R&D and innovation organisational landscape of the UK. The review is currently underway (BEIS, 2022d).

process of organisation establishment is an interesting characteristic of the UK industrial innovation policy and builds on a strong tradition of reviews in the country, going back to Viscount Haldane's report of 1918, Lords Dainton and Rothschild's of 1971, Lord Waldegrave's of 1993 (Nurse, 2015), and more recently Lord Sainsbury's report on technical education (Independent Panel on Technical Education, 2016). The relevance of high-profile reviews in the process of organisation established in the UK could be the object of further exploration. For example, it could be interpreted as a straightforward mechanism to make policy decisions more 'technical', or as a political mechanism used by the government to 'outsource' the responsibility for the policy (and thus to potentially reduce the political risk if results are not achieved). On the other hand, it may reflect a lack of policy capability in government, and overreliance on individuals may further contribute to this.

Organisation evaluation

The Cabinet Office of the UK Government has a document (first published in March 2016 and last updated in May 2019) that guides the review of public bodies named: "Tailored Reviews: Guidance on Reviews of Public Bodies" (Cabinet Office, 2019). It sets out the principles for government departments to use when reviewing public bodies. The principles aim to ensure public bodies remain fit for purpose, well governed and properly accountable for what they do. The guidance offers greater flexibility to departments so that reviews are proportionate to the size and type of a public body and more flexible in timing and approach. The scope of tailored reviews includes non-departmental public bodies such as UKRI and extends to executive agencies and all non-ministerial departments. Departments continue to lead these reviews and must undertake a tailored review of their public bodies at least once in the lifetime of a Parliament (Cabinet Office, 2019).

Reviews of TSB and Innovate UK

For TSB a triennial review was carried out in 2013. The first stage of the review assessed the continuing need for the functions and form of the organisation, while the second stage examined compliance with statutory accountabilities, and financial and management responsibilities as defined by the Cabinet Office. The review was carried out by a team of officials from BIS which were independent of TSB and from the BIS sponsor team responsible for overseeing TSB. It received views from over 60 stakeholders with business, local government, central government, and scientific and engineering backgrounds. The team also sought the views of the TSB and interested BIS officials and attended regular meetings with them to share progress.

The review concluded that TSB should be kept with its functions, given that they contributed to the delivery of Government objectives of improving economic performance and the delivery of public services. It also concluded it should keep its form as a Non-Departmental Public Body given that it offered the best delivery model in terms of the effectiveness of delivery, independence and impartiality and likely costs and benefits. The Stage 2 conclusions were that TSB complied with all key accountabilities but made several recommendations for improvement (BIS, 2013b).

Although no official reviews have been made since TSB changed its name to Innovate UK, a larger independent review of UKRI has been carried out recently. Led by Sir David Grant and explicitly following the Tailored Review guidelines, it evaluated the efficacy, efficiency, accountability, and governance of the organisation. The review concluded that UKRI has helped maintain the UK's position

as a world leader in research, and by some metrics, the agency outperforms other national research and development funders in the G7. It also found issues in terms of coordination of the nine constituent bodies of UKRI, and a lack of clarity on organisational aims and purpose (BEIS, 2022).

Reviews of Catapult Centres

The Catapults have been reviewed several times by different entities. In 2014, the same Dr Hermann Hauser (of the Hauser report that led to the creation of Catapults in the first place) made a review of the Catapult network stating his positive surprise towards the degree of progress made and the quality of the people and facilities in the emerging network. He also urged the government to keep the mixed funding model and to keep expanding the UK's 'translational infrastructure, by adding one or two centres a year, until around 30 centres were established by 2030.

In 2017, BEIS commissioned an independent report from Ernst & Young. This report overall found examples of positive progress in all Catapults, but also made strong critical observations relating to the Catapults' purpose statements, governance processes, management practices, and funding model achievements. Overall, they claimed that "with the Catapult network's overall lack of a clearly articulated set of objectives, or a framework for measuring impact, and the current level of operational performance, it is unlikely that the impact of the network overall has been significant so far", and that to that date, "the Catapult network is unlikely to have provided the benefits and value for money envisaged at the outset". Among the recommendations, it was said that the Catapults should provide "robust, focused business plans supported by measurable milestone plans that will lead to economic benefits for the UK economy through *addressing articulated market failures*" (emphasis added). Important exceptions were made regarding the High-Value Manufacturing Catapult and the Cell and Gene Therapy Catapult, which had shown more evidence of positive impact than the other ones, with the High-Value Manufacturing Catapult being the only one to achieve the 1/3 public ('Core Grant' only), 1/3 collaborative R&D and 1/3 commercial funding expectations. All the other Catapults remained overwhelmingly reliant on public funding (EY, 2017).

In 2021 a third review of the Catapult centres was published by BEIS, focusing on how the Catapults could strengthen R&D capacity in local areas and improve productivity and contribute to greater prosperity in the UK. The review was based on "a series of stakeholder round tables and one-to-one interviews, internal workshops with BEIS, UKRI including Innovate UK, and responses to the R&D Roadmap survey". Overall, the review was very positive towards the Catapults, stating that they are a critical part of the UK innovation system, by bridging the gap between research and business. It acknowledged that the impacts of the different Catapults varied, mentioning that the longest established ones had the greatest impacts, suggesting "there are benefits to giving them time to establish themselves in particular sectors". Interestingly, the review also put into question the review processes itself, stating that the government should move away from extensive reviews and instead focus on supporting them to be more effective institutions. More specifically it was recommended that "Innovate UK / UKRI agrees with BEIS a clear, consistent 5-year review cycle which builds in expert review panels, and that this is maintained".

It can thus be seen that the UK has a tradition of evaluating public organisations, which seems to stem from the traditional rationale that government interventions should be based on a 'market failure' logic – that is, the view that every public organisation must prove that it is effectively contributing to

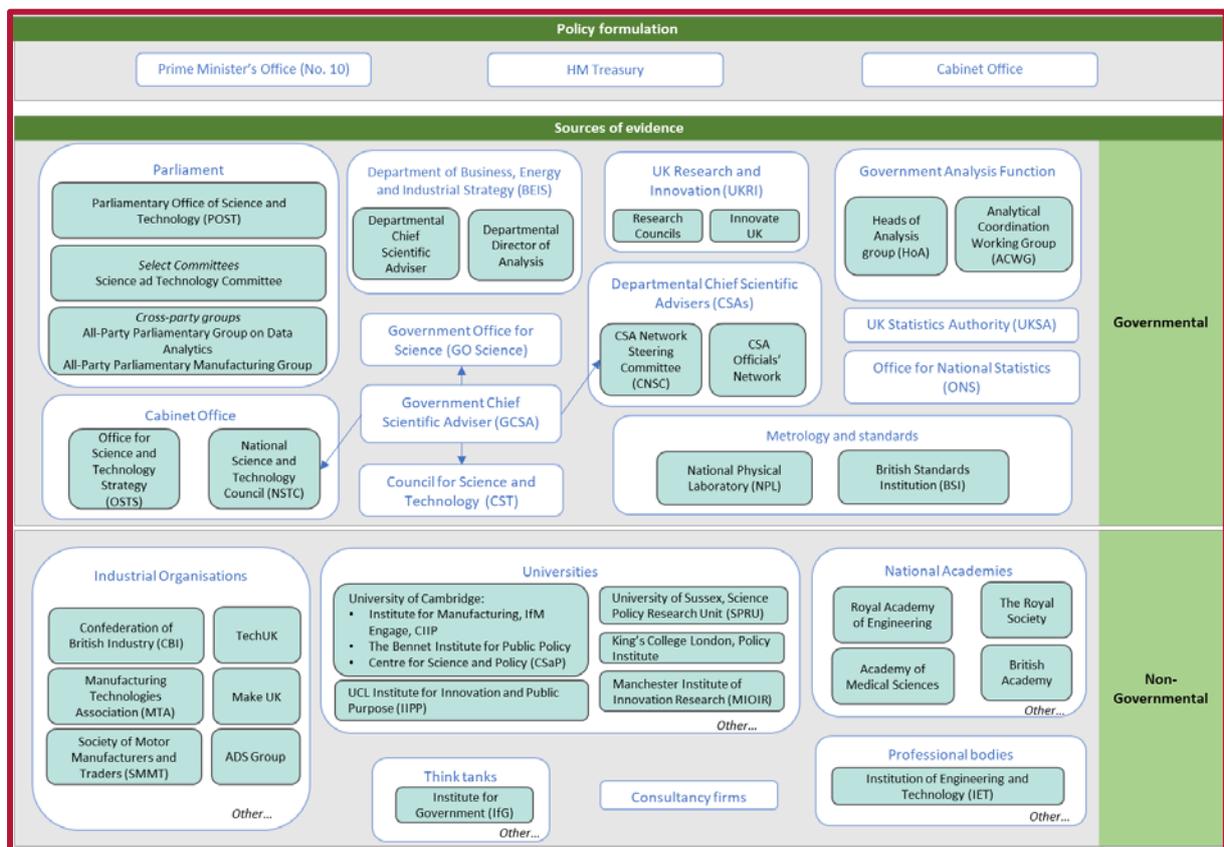
outcomes that would not be achieved by the private sector alone. In the last review of the Catapult centres, however, it was also perceived that reviews have been too sporadic and unstructured, and a regular and more consistent review cycle should be put in place. This would make the goals and expectations clearer for the organisations and would have the main objective of helping them become more effective – as opposed to reviewing whether they should exist at all. This seems to be in line with the call for looking beyond the 'market failure' rationale observed in the recent additions to the Green Book of policy evaluation.

Processes

Policy formulation

The formulation process typically involves consultations with actors from the government, industry, academia, and the public. This is done through advisory groups, councils, boards, committees, public consultations, and less formally through workshops, meetings, and interviews. Figure 1 below maps organisations that usually produce evidence that is considered in the industrial innovation policy formulation process (a description of all organisations mentioned in Figure 2 can be found in Annex I).

Figure 2 – Map of organisations involved in providing evidence for industrial innovation policy formulation in the UK⁵



However, each policy ends up having a different process, in which different voices are heard. For example, when the Industrial Strategy 2017 was being formulated, BEIS published the Industrial Strategy Green Paper named "Building our Industrial Strategy". With the publication of the Green Paper, a public consultation was open – in the document itself, there were instructions and contact details on how to respond to the Paper. Over 2,000 responses were recorded, including, for example, a report named 'Industrial Strategy: First Review' by the House of Commons Business, Energy and Industrial Strategy Committee (House of Commons, 2017a) – which ran its consultation process –, and a 100-page document produced by Engineering the future, an alliance of 38 professional engineering bodies in the UK led by the Royal Academy of Engineering, written as a direct response to the Green Paper (Engineering the

⁵ Source: Elaborated by Policy Links Unit, IfM Engage. Source consulted: Government Office for Science (2020).

Future, 2017). In the government's response to the House of Commons Committee report, it can be observed that some recommendations were taken into consideration – for example, in developing metrics to measure the impacts of the Industrial Strategy, and in the publication of updates on its progress (House of Commons, 2017b).

With the publication of 'Build Back Better: Plan for Growth', and the subsequent 'UK Innovation Strategy' in 2021, the process was quite different. First, the Plan for Growth was published by HMT and not BEIS. Secondly, there was no such public consultation process. While the Plan for Growth paper does not mention its formulation process, the Innovation Strategy cites two groups that were very influential in its elaboration: the Innovation Expert Group, chaired by Dr Hayaatun Sillem, created after the publication of the R&D Roadmap in July 2020; and the Prime Minister's Council for Science and Technology, which has directly informed the strategy. For example, a directly cited correspondence is available in CST (2021).

It can be thus observed that a marked characteristic of UK policymaking is variation in the policy formulation processes. By not having strict processes for policy formulation, these vary according to the priorities of the specific groups (or individuals) in power. This relates to a wider recurrence in British policymaking of frequent recreation of policies and organisations. According to some analyses, this would be a symptom of poor institutional memory, a tendency to abolish and recreate organisations as a proxy for demonstrating progress, and a centre of government that is too weak at long-term planning (Norris & Adam, 2017). In this context of change and churn, variations in policy formulation processes occur.

Policy evaluation

In the UK, two books published by HM Treasury guide government officials on policy appraisal and evaluation: the Green Book and the Magenta Book. The Green Book guides how to appraise policies, programmes, and projects. It also guides the design and use of monitoring and evaluation before, during and after implementation. The Magenta Book provides more detailed technical guidance on evaluation methods.

The rationale for government intervention in the UK has traditionally been framed in terms of market failures. However, recent changes to the HM Treasury's Green Book state that appraisal should be based on social value and welfare economics (although still in terms of monetary costs), and not simply economic market efficiency. This means that while market failures can be used as a basis for the rationale behind the intervention, policymakers are not limited to them. The appraisal of any business cases should include all significant costs and benefits that affect the welfare and well-being of the population. For example, environmental, cultural, health, social care, justice and security effects should be considered.

Understanding market failures and the other welfare and well-being considerations involved in developing the rationale behind government intervention is important but it is only part of the story. Any proposed government intervention needs a strong economic case supported by robust evidence that it will deliver social benefits that outweigh the cost of the intervention. It will also need careful

consideration for how an intervention will be delivered, managed, and financed in a way that optimises the social/public value produced by the use of public resources.⁶

Following these guidelines, evaluation processes for specific policies are also drawn. For example, the Industrial Strategy 2017 was annually evaluated by the Industrial Strategy Council – an independent non-statutory advisory group composed of leading men and women from business, academia, and civil society, tasked with providing impartial and expert evaluation of the government’s progress in delivering the aims of the Industrial Strategy. The results of this evaluation were published in the Industrial Strategy Council’s annual reports.

According to a 2021 National Audit Office report, since 2013 the UK government has been taking steps to strengthen policy evaluation in the country. These included establishing the cross-government What Works Trials Advice in 2015, setting up the Analysis Function in 2017, publishing an update to the Magenta book in 2020, and creating the Evaluation Task Force in 2021. Despite these efforts, much government activity is still either not evaluated robustly, or not evaluated at all. According to the report: “Out of government’s 108 most complex and strategically significant projects in its Government Major Projects Portfolio, only nine – representing 8% of £432 billion in spending – are evaluated robustly, while 77 (64% of spend) have no evaluation arrangements.” (NAO, 2021, p. 6)

Recent policy evaluations

Industrial Strategy 2017

The Industrial Strategy 2017 benefited from over 2,000 responses to its public consultation. A significant contribution came from a report from the House of Commons' Business, Energy and Industrial Strategy Committee named 'Industrial Strategy: First Review'. The Committee carried out its own consultation process and presented several recommendations for the formulation of the Industrial Strategy. The government responded to this report (see House of Commons, 2017b), clarifying which recommendations they would take into consideration – such as the ones on evaluation metrics and mechanisms for progress advertisement –, and which they felt were unwarranted or unfeasible.

A second important source of evidence was the already mentioned document written by Engineering the Future, an alliance of 38 professional engineering bodies in the UK, named “Engineering an economy that works for all”. The report was written based on a survey with 1,279 engineers and suggested key pillars for the industrial strategy (Engineering the Future, 2017).

Finally, the Industrial Strategy White Paper seems to have been influenced by ideas coming from Academia. In particular, the strategy's focus on 'Grand Challenges' is closely aligned with Prof. Mariana Mazzucato's idea of 'mission-oriented' policies. Mazzucato was explicitly cited in the final White Paper, and she and Prof. Jim Watson (both then at SPRU, University of Sussex) provided written evidence to the House of Commons report mentioned above (Mazzucato & Watson, 2016; UCL, 2017). In addition to these written contributions, BEIS also conducted an extensive series of meetings and discussions around the topic of industrial strategy from ministerial to official levels.

⁶ Treasure guidance on business cases for projects and programmes can be found alongside the Green Book. <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

In the Industrial Strategy White Paper, it was stated that an independent Industrial Strategy Council (ISC) would be created to develop measures to assess and evaluate the Industrial Strategy and make recommendations to the government. The Council was established in November 2018 and produced annual reports tracking the progress and implementation of the measures of the Industrial Strategy. The 2020 Annual report of the ISC evaluated several aspects of the Industrial Strategy progress, analysing specific areas and programmes, and highlighting that a successful policy relies on three factors: scale, longevity, and coordination. The 2021 report, on the other hand, already acknowledged the end of the Industrial Strategy and its substitution by the Plan for Growth and provided several recommendations and criticisms of the new policy. The criticisms included too little prioritisation, too much centralisation, and inadequate evaluation (ISC, 2020; ISC, 2021; Haldane, 2021)

Plan for Growth and Innovation Strategy 2021

The Plan for Growth and Innovation Strategy 2021 did not state any mechanism for policy evaluation so far, which highlights the variation in policy processes mentioned before.

Neither the Plan for Growth nor the Innovation Strategy 2021 made use of a public call for reviews, so it is harder to track which inputs were used. However, the Innovation Strategy 2021 explicitly mentions the key participation of the Innovation Expert Group, and the Prime Minister's Council for Science and Technology – and more specifically the report "Scaling the Impact of Innovation in the United Kingdom" (Council for Science and Technology, 2021).

The Innovation Strategy 2021 also explicitly mentions the pandemic-related Vaccine Taskforce and RECOVERY trial as inspiration and claims to have identified several core lessons from the pandemic in the writing of the strategy.

Content

Input Content

The input content of the recent UK policies is evaluated here. While several key strategies relate to industrial issues, such as the Net Zero strategy, or the Levelling Up strategy, here we will limit the analysis to the policies that focus more directly on industrial innovation issues. These are: Industrial Strategy 2017, Build Back Better: Plan for Growth (2021) (henceforth 'Plan for Growth'), and Innovation Strategy 2021.

Industrial Strategy 2017

As mentioned above, the Industrial Strategy 2017 benefited from over 2,000 responses to its public consultation. A significant contribution came from a report from the House of Commons' Business, Energy and Industrial Strategy Committee named 'Industrial Strategy: First Review'. The Committee carried out its own consultation process and presented several recommendations for the formulation of the Industrial Strategy. The government responded to this report (see House of Commons, 2017b), clarifying which recommendations they would take into consideration – such as the ones on evaluation metrics and mechanisms for progress advertisement –, and which they felt were unwarranted or unfeasible.

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Policy document contents

Here the contents of the three recent industrial innovation policy documents will be summarised. The focus will be given to their objectives, pillars (i.e., main priority areas), and evaluation processes.

Industrial Strategy 2017

The objectives of the Industrial Strategy 2017 included four 'Grand Challenges:

- AI & Data Economy: putting the UK at the forefront of the artificial intelligence and data revolution
- Clean Growth: maximise the advantages for the UK industry from the global shift to clean growth
- Future of Mobility: We will become a world leader in the way people, goods and services move
- Ageing Society: We will harness the power of innovation to help meet the needs of an ageing society

Plan for Growth (2021)

Although the Plan for Growth does not have a clear set of objectives, these can be perceived in several passages of the document:

- “These plans make progress on delivering the UK Government’s objective of over £600 billion of gross public sector investment over the next five years.”
- “(...) historic levels of investment will be required in UK infrastructure in the coming years, to maintain and upgrade networks to meet the UK Government’s objectives for economic growth and decarbonisation.”
- “(...) to help meet government objectives on climate change and regional economic growth.”
- “Infrastructure investment will be central to meeting our net zero objectives.”
- “These outcomes capture the government’s long-term policy objectives, including the people’s priorities of levelling-up, net zero and global Britain”
- “Putting the UK on the path to meeting its net zero emissions target by 2050”
- “(...) and drive progress towards the target for total UK investment in R&D (public and private) to reach 2.4% of GDP by 2027.”
- “(...) becoming a world-leader in technology to capture and store harmful emissions away from the atmosphere, with a target to remove 10Mt of carbon dioxide per year by 2030”
- “Producing enough offshore wind to generate more power than all our homes use today, a target of 40GW offshore by 2030, including 1GW of advanced floating rigs.”

Innovation Strategy 2021

Like the Plan for Growth, the Innovation Strategy also does not have a clear set of objectives, but these can be identified in the following passages of the document:

- “(...) to boost private sector investment across the whole of the UK, creating the right conditions for all businesses to innovate and giving them the confidence to do so.”
- “(...) making the UK a global science superpower, turning world-leading science and ideas into solutions for the public good.”
- “(...) to be a force for good on global challenges around climate, biodiversity, prosperity and security.”
- “The UK government, therefore, has an overarching goal of making the UK *a global hub for innovation*, placing innovation at the centre of everything this nation does.” (italics in the original)
- 4 key objectives are described in the Pillars:
 - Fuel businesses who want to innovate.

- Make the UK the most exciting place for innovation talent.
- Ensure our research, development & innovation institutions serve the needs of businesses and places across the UK.
- Stimulate innovation to tackle major challenges faced by the UK and the world and drive capability in key technologies.
- “Promoting an inclusive innovation sector will be a central objective across all the innovation programmes the UK government takes forward in the coming years.”
- “(...) target mobile investments which support the objective of securing long-term strategic advantage for the UK.”
- “(...) our strategic objectives of Net Zero, Global Britain and Levelling Up (...)”
- “We are therefore setting a target of reversing this brain drain by 2030.”
- “At a systemic level, we have a target of increasing public and private sector R&D expenditure to 2.4% of GDP to support the UK being a science superpower with a world-class research and innovation system.”

In summary, the main broad objectives of the surveyed UK industrial innovation policies are:

- **Increasing R&D expenditure and innovation:** make R&D expenditure in the country reach 2.4% of GDP and make the UK a ‘science superpower’ or a ‘global hub of innovation’.
- **Net Zero:** decarbonising all sectors of the UK economy to reach net zero emissions by 2050.
- **Levelling up:** according to the levelling-up campaign website, ‘Levelling up’ means: “boosting productivity, pay, jobs and living standards by growing the private sector, especially in those places where they are lagging; spreading opportunities and improving public services, especially in those places where they are weakest; restoring a sense of community, local pride and belonging, especially in those places where they have been lost; empowering local leaders and communities, especially in those places lacking local agency”.
- **Global Britain:** Brexit-inspired, Global Britain is about repositioning the UK on the global scene. According to the UK government's website: "Global Britain is about reinvesting in our relationships, championing the rules-based international order and demonstrating that the UK is open, outward-looking and confident on the world stage.”

Pillars

The areas of action (Pillars) of the recent UK policies are:

Industrial Strategy 2017	Plan for Growth	Innovation Strategy 2021
Ideas	Infrastructure	Unleashing Business
People	Skills	People
Infrastructure	Innovation	Institutions & Places
Business environment		Missions & Technologies
Places		

The similarity of these areas of intervention across the policies backs the argument made in an Institute for Government study that in the UK: "Government tends to recreate policies and organisations on an alarmingly regular basis. New organisations replace old ones; one policy is ended while a remarkably similar one is launched" (Norris & Adam, p. 3).

Output Content

A summary of the main UKRI sub-agencies, funds, and programmes follows:

Examples of UKRI sub-agencies, funds, and programmes:

- *Research Councils:*

The Research Councils provide funding for projects across several areas. Each Council has a slightly different process, but usually, they work through open competitive Calls for Applications for grants or fellowships. These are usually assessed through a two-stage peer review and decision-making process. Initially, the applications are sent to reviewers, who provide comments and decide if the application is supported or not. If supported the application is sent to a Panel, where the applications are ranked, and a decision is made on the funding. The existing Research Councils are:

- Arts and Humanities Research Council
- Biotechnology and Biological Sciences Research Council
- Economic and Social Research Council
- Engineering and Physical Sciences Research Council
- Medical Research Council
- Natural Environment Research Council
- Science and Technology Facilities Council

- *Research England:*

Research England is a UKRI agency responsible for funding and engaging with English higher education providers (HEPs). It has a funding allocation process for the research expenses of HEPs (which can be spent largely as they choose). The amount that each HEP receives is based on its quality, volume, and relative cost of research in different subject areas, to make sure funding is targeted to where quality is highest. Quality is measured through a periodic exercise known as the Research Excellence Framework (REF). Research England also has funding opportunities for individual projects, such as the Connecting Capabilities Fund, Expanding Excellence in England Fund, Research England Development Fund, UK Research Partnership Investment Fund, and University Enterprise Zones.

- *Innovate UK*

Innovate UK is the UK's national innovation agency. It provides support for business-led innovation in all sectors, technologies and UK regions. This is done in a number of ways including through grants and loans, chosen through a competitive process. The assessment is based on four criteria: 1. Size of the market opportunity; 2. Business capability; 3. Appropriate timing; 4. Value-added for the involvement of Innovate UK. Many of the grants support collaborative work between businesses, or between businesses and knowledge-base partners.

Innovate UK often works in collaboration with several innovation partners, including BEIS, British Business Bank, British Standards Institution (BSI), Defence and Security Accelerator, Defence, Science and Technology Laboratory, Department for International Trade, Intellectual Property Office, National Physical Laboratory (responsible for UK metrology infrastructure and development).

Important Innovate UK programmes include:

- Innovate UK's '**Knowledge Transfer Network**' (KTN) builds innovation networks in high-potential areas and helps innovators find the right partners. For firms in all

innovation stages: pre-seed, early stage, growth stage or scale-up, KTN can make introductions to new business partners, help companies find collaborators for grants and project delivery, or introduce them to new market opportunities and customers. The way KTN works is as follows: firms get in touch and discuss with KTN experts their innovation and business needs, and then they can connect the firm to a wider network of companies, academics, funders, and sector stakeholders.

- **Catapult Network:** Catapults are physical centres with cutting-edge R&D infrastructures including hubs, laboratories, testbeds, factories and offices. They work with thousands of innovative businesses across a wide range of sectors, such as manufacturing, space, health, digital, energy, transport, telecoms, etc. Focusing on late-stage research and development, they help the industry get high-potential ideas to market.
- **Innovate UK EDGE** is a publicly funded service available to all high-potential small to medium-sized innovation-driven companies. Innovation and growth specialists are at the core of their service. Each client engagement results in a bespoke strategy but common priorities include 1. Exploiting business innovation: Developing a commercial strategy and building a team to deliver it; protecting & harnessing IP; improving innovation management & accessing the innovation ecosystem globally; 2. Sourcing funding and finance: Applying the right strategy to secure grants and capital for the business, enhancing investor appeal and getting investment ready to propel the companies' growth; 3. Opening new markets: Creating connections to partners & leveraging insights to expand into vertical & international markets and achieve scale.
- *UKRI Funds*
 - The **Industrial Strategy Challenge Fund (ISCF)** addresses the big societal challenges being faced by UK businesses today. It's made up of 23 challenges, covering the four themes of the government's 2017 Industrial Strategy: clean growth, ageing society, future of mobility, artificial intelligence, and data economy. The fund is backed by £2.6 billion of public money, with £3 billion in matched funding from the private sector. A notable initiative funded by the Fund is the Made Smarter programme, aimed at increasing the adoption of industrial digital technologies by UK manufacturers.
 - The **Global Challenges Research Fund (GCRF)** supports cutting-edge research to address challenges faced by developing countries. It is part of the UK's official development assistance (ODA) and is managed by the Department for Business, Energy and Industrial Strategy. The fund addresses the United Nations' sustainable development goals. It aims to maximise the impact of research and innovation to improve lives and opportunities in the developing world. UKRI are one of the delivery partners alongside the Scottish Funding Council, Higher Education Funding Council for Wales, Higher Education Division Northern Ireland, Academy of Medical Sciences, Royal Society, British Academy, Royal Academy of Engineering and UK Space Agency. They also work in partnership with other organisations including the United Nations Development Programme (UNDP).
 - The **Strategic Priorities Fund** is an £830 million investment in multi- and interdisciplinary research across 34 themes. It is funded through the government's National Productivity Investment Fund and managed by UK Research and Innovation. The fund aims to: increase high-quality multi- and interdisciplinary research and

innovation; ensure UKRI investment links up effectively with government research and innovation priorities; respond to strategic priorities and opportunities.

- The **Strength in Places Fund (SIPF)** is a UKRI programme that helps areas of the UK to build on existing strengths in research and innovation to deliver benefits for their local economy. It aims to: support innovation-led regional growth; enhance local collaborations involving research and innovation. Projects focus on a self-defined area anywhere in the UK, not limited by nations or regions. All projects are collaborative and are led by consortiums that include both research organisations and businesses. Consortiums also need strong engagement from local leadership partners. The fund is open to any sector, area of technology or research discipline. Following an initial assessment, we award each shortlisted consortium seed funding to develop their application for full funding. We consider the potential for impact on the local economy when selecting projects to receive full funding. SIPF is funded from the Strategic Programmes budget (formerly the National Productivity Investment Fund).
- **Future Leaders Fellowships** support talented people in universities, businesses, and other research and innovation environments. They also allow universities and businesses to develop their most talented early career researchers and innovators or to attract new people to their organisations, including from overseas.
- The **Fund for International Collaboration** is a £160 million fund supporting international collaborations. It enhances the UK's ability to build new, and strengthen existing, partnerships with global research and innovation leaders. UKRI has worked with the Department for Business, Energy and Industrial Strategy to identify key partner countries for collaboration including China, Canada, South Korea and the US. There are 20 partner countries involved in our bilateral and multilateral programmes to date.

- Non-UKRI: *Advanced Research and Invention Agency (ARIA)*

ARIA is being developed as an organisation that will complement UKRI, seeking to help the government's ambition of investing £14.6 billion in R&D in 2021 and 2022 and building toward the target of 2.4% of GDP spent on R&D by 2027. It is being announced as an independent (BEIS, 2022c), high-risk, high-reward agency that seeks to replicate US Advanced Research Projects Agency's (ARPA) principles – an organisation known for its lean structure, and high-risk tolerance (CIIP, 2021). In July 2022, the CEO and Chair of the agency were announced (BEIS, 2022b), and the launch of the Agency is planned for the end of 2022.

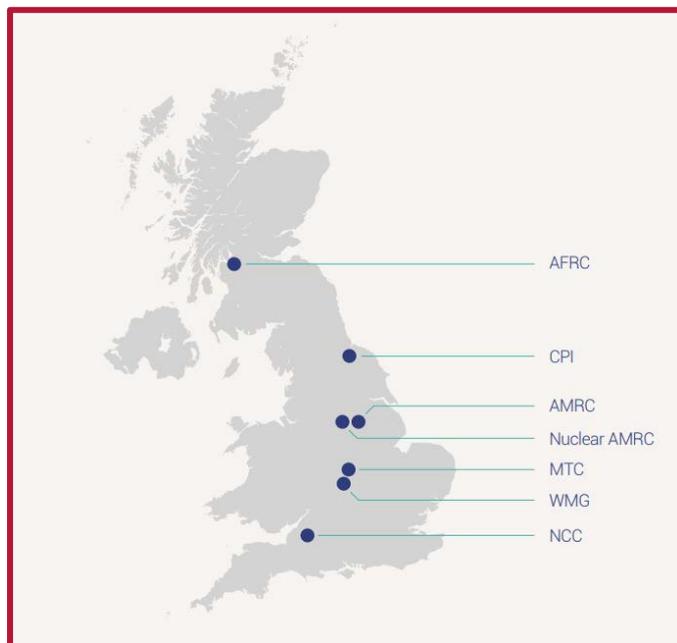
Good Practices

As mentioned above, the High-Value Manufacturing Catapult (HVMC) is considered a success case both by official reviews and by experts in the field. HVMC is a group of seven centres of industrial innovation brought together in 2011 by Innovate UK to accelerate the commercialisation of innovative new products and processes. Some of these centres existed for a long time before they were consolidated into HVMC. Table 1 and Figure 4 below list the HVMC, when they were founded, and their locations.

Table 1 – Innovation centres that compose HVMC⁷

Centre	Foundation year	Location
Warwick Manufacturing Group (WMG)	1980	University of Warwick
Advanced Manufacturing Research Centre (AMRC)	2001	University of Sheffield
Centre for Process Innovation (CPI)	2004	Redcar, Sedgefield and Darlington
Advanced Forming Research Centre (AFRC)	2009	University of Strathclyde
Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC)	2009	University of Sheffield
Manufacturing Technology Centre (MTC)	2010	Near Coventry
National Composites Centre (NCC)	2011	Bristol and Bath Science Park

Figure 3 – Geographical location of the HVMC centres⁸



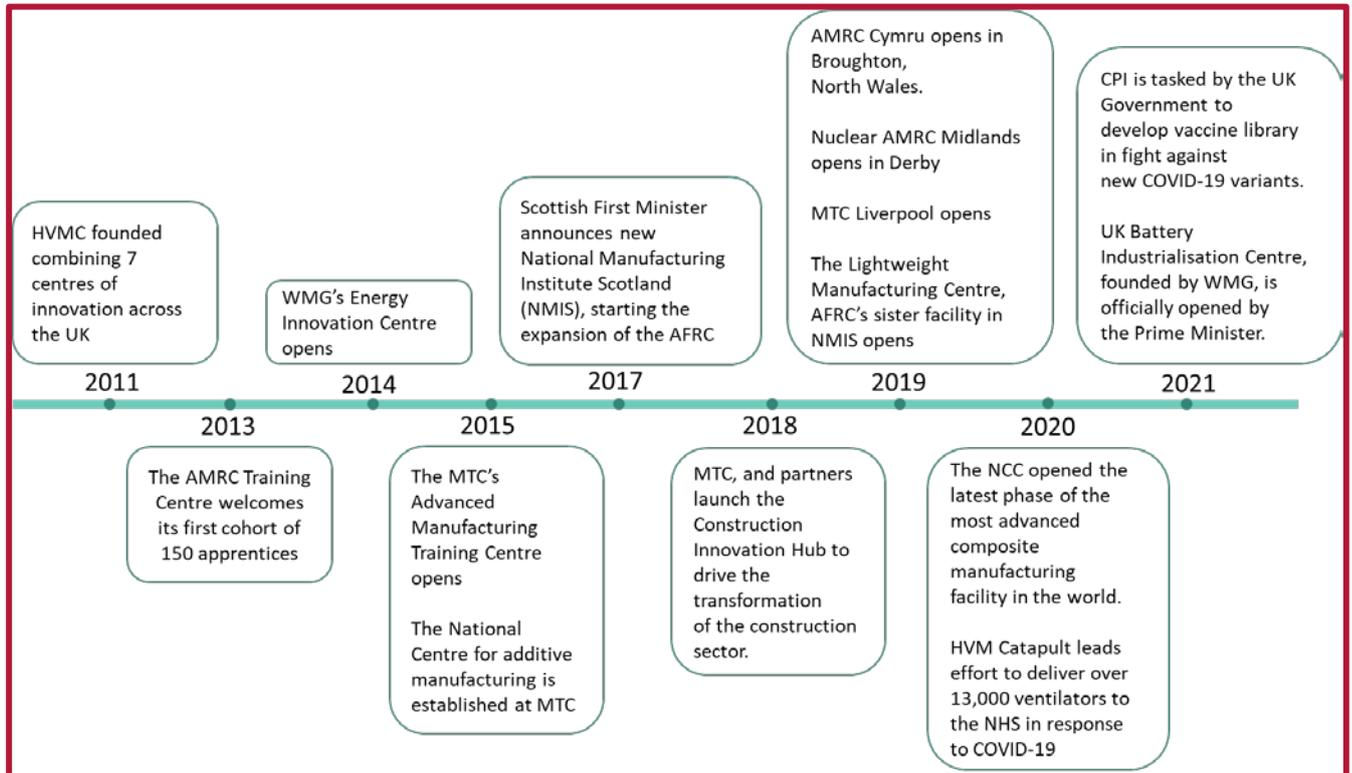
In the 2011-2021 period, HVMC has worked with 21,734 companies, of which 54% were SMEs, working on a total of 9,257 commercial and collaborative R&D projects. In that period, it has grown from a base of 493 experts in advanced manufacturing innovation in 2011 to 3,112 in 2021, and it now works with 5 times as many SMEs per year as in 2012-13. The facilities of HVMC have grown 3.5 times in that period,

⁷ Source: HVMC website.

⁸ Source: HVMC, 2019, p. 20.

reaching £828 million worth of assets in 2021. Key events in HVMC's history are highlighted in Figure 5 below.

Figure 4 – Key events in HVMC's history⁹



According to Dick Elsy, CEO of HVMC for eight and a half years and recently retired, the Catapult enabled genuine regional industrial transformation during the past decade. Major cases of successful transformation include:

- The University of Sheffield AMRC and the Nuclear AMRC transforming the Orgreave colliery and coking works into an international hub of industrial collaboration, bringing firms like Rolls-Royce, McLaren, and Boeing to Rotherham and Sheffield.
- The MTC moved from a 10-person team in a portacabin to a site of crowded investment, attracting £600 million to Ansty Park, including Meggitt's £130 million innovation centre.
- WMG continues to grow its global reputation in battery technology, making Coventry a go-to destination for battery investment.
- The AFRC grew from a small Centre focused on forming and forging into a Scottish industrial powerhouse, leading to the creation of Scotland's first major advanced manufacturing park and a £100 million investment in the new National Manufacturing Institute Scotland (NMIS).
- The NCC is the anchor of the HVMC in the South West, building the UK's sovereign capability in aircraft structures and leading digital innovation.
- CPI has a major impact in North East England, advancing the national capability for advanced vaccine development and contributing significantly to healthcare resilience in the UK (HVMC, 2021).

⁹ Source: Adapted from HVMC, 2021

References

Coyle, D. & Muhtar, A. (2021) UK's Industrial Policy: learning from the past? *Productivity Insights Paper No. 002, The Productivity Institute.*

Bailey & Driffield, 2005

BIS (Department for Business, Innovation & Skills) (2012a), *Industrial Strategy: UK Sectoral Analysis*, London, Department for Business, Innovation and Skills.

____ (2012b), *Strengthening UK Supply Chains: Public Procurement*, London, Department for Business, Innovation and Skills.

____ (2013a), *Building the Business Bank. Strategy Update*, London, Department for Business, Innovation and Skills

____ (2013b). *Technology Strategy Board: a triennial review*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/253593/bis-13-1073-triennial-review-of-the-technology-strategy-board.pdf . Accessed on: 27/06/2022.

____ (2021). *Independent review of UK Research and Innovation (UKRI): terms of reference*. Available at: <https://www.gov.uk/government/publications/independent-review-of-uk-research-and-innovation-ukri/independent-review-of-uk-research-and-innovation-ukri-terms-of-reference> . Accessed on: 26/06/2022

BEIS (Department for Business, Energy & Industrial Strategy) (2017) *Industrial Strategy: building a Britain fit for the future*. Available at: <https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future> . Accessed on: 11/07/2022.

____. (2021) *UK Innovation Strategy: leading the future by creating it*. Available at: <https://www.gov.uk/government/publications/uk-innovation-strategy-leading-the-future-by-creating-it> . Accessed on: 11/07/2022

____. (2022) *Independent review of UK Research and Innovation (UKRI): final report and recommendations*. Available at: <https://www.gov.uk/government/publications/independent-review-of-uk-research-and-innovation-ukri/independent-review-of-uk-research-and-innovation-ukri-final-report-and-recommendations> . Accessed on: 25/07/2022

____. (2022b) *Innovation heavyweights appointed to lead new Advanced Research and Invention Agency*. Press Release. Available at: <https://www.gov.uk/government/news/innovation-heavyweights-appointed-to-lead-new-advanced-research-and-invention-agency/> . Accessed on 25/07/2022.

____. (2022c) *Independence of the Advanced Research and Invention Agency (ARIA)*. Notice. Available at: <https://www.gov.uk/government/publications/independence-of-the-advanced-research-and-invention-agency-aria> . Accessed on: 25/07/2022.

____. (2022d) Research, development and innovation organisational landscape: an independent review. Independent report. Available at: <https://www.gov.uk/government/publications/research-development-and-innovation-organisational-landscape-an-independent-review> . Accessed on 01/08/2022.

Cabinet Office (2019) Tailored Reviews: guidance on reviews of public bodies. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/802961/Tailored_Review_Guidance_on_public_bodies_May-2019.pdf . Accessed on: 27/06/2022.

CIIP (Cambridge Industrial Innovation Policy) (2021) ARIA and the value of change-led innovation. Reports and articles. Available at: <https://www.ciip.group.cam.ac.uk/reports-and-articles/aria-and-value-challenge-led-innovation/> . Accessed on: 25/07/2022.

Council for Science and Technology (2021). Scaling the impact of innovation in the United Kingdom. *Council for Science and Technology*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1002994/CST_Letter_Innovation.pdf . Accessed on: 27/06/2022

DB (Designing Buildings) (2022). Technology Strategy Board TSB. Available at: https://www.designingbuildings.co.uk/wiki/Technology_Strategy_Board_TSB . Accessed on 27/06/2022.

Engineering the Future (2017). Engineering an economy that works for all: Industrial Strategy Green Paper response. *Royal Academy of Engineering*. Available at: <https://www.raeng.org.uk/publications/responses/engineering-an-economy-that-works-for-all> . Accessed on 27/06/2022

EY (2017). Catapult Network Review. *UK SBS PS17086*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/662509/Catapult_Review_-_Publishable_Version_of_EY_Report_1_.pdf . Accessed on 27/06/2022.

Government Office for Science (2020) Guidance for government Chief Scientific Advisers and their Officials. Chief Scientific Advisers and their officials: an introduction. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/856166/chief-scientific-advisers-and-their-officials-an-introduction.pdf . Accessed on 15/08/2022.

Haldane, A. (2021). UK industrial strategy is dead, long may it live. *Financial Times*, 22 March 2021. Available at: <https://www.ft.com/content/5ed942d1-7f8e-4494-84f1-840e7e414aec> . Accessed on 27/06/2022.

Hauser, H. (2010) The Current and Future Role of Technology and Innovation Centres in the UK. *A report by Dr. Hermann Hauser for Lord Mandelson, Secretary of State Department for Business, Innovation & Skills*. Available at: <https://publications.parliament.uk/pa/cm201617/cmselect/cmbeis/616/616.pdf> . Accessed on: 11/07/2022.

Hauser, H. (2014). Review of the Catapult network: recommendations on the future shape, scope and ambition of the programme. Available at: <https://catapult.org.uk/wp-content/uploads/2020/12/Hauser-Review-of-the-Catapult-network-2014.pdf> . Accessed on 27/06/2022.

House of Commons (2017a) Industrial Strategy: First Review. *House of Commons – Business, Energy, and Industrial Strategy Committee, Second Report of Session 2016-17*. Available at: <https://publications.parliament.uk/pa/cm201617/cmselect/cmbeis/616/616.pdf>. Accessed on: 11/07/2022.

House of Commons (2017b). Industrial Strategy: First Review: Government Response to the Committee's Second Report of Session 2016–17. *House of Commons – Business, Energy and Industrial Strategy Committee, First Special Report of Session 2017-2019*. Available at: <https://publications.parliament.uk/pa/cm201719/cmselect/cmbeis/337/337.pdf> . Accessed on 01/08/2022.

HM Treasury (Her Majesty's Treasury) (2021) Build Back Better: our plan for growth. Available at: <https://www.gov.uk/government/publications/build-back-better-our-plan-for-growth> . Access on: 11/07/2022.

HVMC (High Value Manufacturing Catapult) (2019). High Value Manufacturing Catapult: an overview. Available at: <https://hvm.catapult.org.uk/wp-content/uploads/2019/01/HVM-Catapult-brochure.pdf> . Accessed on 27/06/2022.

HVMC (High Value Manufacturing Catapult) (2021). High Value Manufacturing Catapult Annual Review 2020/21: manufacturing a clean green recovery. Available at: <https://hvm.catapult.org.uk/wp-content/uploads/2021/08/HVM-ANNUAL-REVIEW-2021-PRINT-DIGITAL.pdf>. Accessed on 27/06/2022.

Independent Panel on Technical Education (2016) Report of the Independent Panel on Technical Education. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/536046/Report_of_the_Independent_Panel_on_Technical_Education.pdf . Accessed on: 25/07/2022.

ISC (Industrial Strategy Council) (2020). *Industrial Strategy Council: Annual report*. Available at: https://industrialstrategycouncil.org/sites/default/files/attachments/ISC%20Annual%20Report%2020_0.pdf . Accessed on 27/06/2022.

ISC (Industrial Strategy Council) (2021). *Industrial Strategy Council: Annual report*. Available at: <https://industrialstrategycouncil.org/sites/default/files/attachments/ISC%20Annual%20Report%2021.pdf> . Accessed on 27/06/2022.

Mazzucato, M. & Watson, J. (2016). Written evidence from SPRU, University of Sussex (ISG0111). *House of Commons – Business, Energy and Industrial Strategy Committee*. Available at: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/business-energy-and-industrial-strategy-committee/industrial-strategy/written/39044.html>. Accessed on 27/06/2022.

NAO (National Audit Office) (2021) Evaluating government spending. HM Treasury, Cabinet Office - Report by the Comptroller and Auditor General. Available at: <https://www.nao.org.uk/wp-content/uploads/2021/12/Evaluating-government-spending.pdf> . Accessed on 22/08/2022.

Norris, E. & Adam, R. (2017) All change: why Britain is so prone to policy reinvention and what can be done about it. *Institute for Government*. Available at: <https://www.instituteforgovernment.org.uk/publications/all-change> . Accessed on: 11/07/2022.

Nurse, P. (2015). Nurse review of research councils. Available at: <https://www.gov.uk/government/collections/nurse-review-of-research-councils> . Accessed on: 25/07/2022.

O'Gardy, F.; Chakraborty, A. & Cridland, J. (2012). Vince Cable's industrial policy: panel verdict. *The Guardian*. Available at: <https://www.theguardian.com/commentisfree/2012/sep/11/vince-cable-industrial-policy>. Accessed on: 11/07/2022

O'Sullivan, E.; Andreoni, A.; López-Gómez, C. & Gregory, M. (2013) What is new in the new industrial policy? A manufacturing systems perspective. *Oxford Review of Economic Policy*, 29 (2), pp. 432-462. Available at: <https://www.jstor.org/stable/23607151> . Accessed on 18/07/2022.

Soete, L. (2007) From Industrial to Innovation Policy. *J Ind Compet Trade* 7, 273. <https://doi.org/10.1007/s10842-007-0019-5>

Sunak, R. & Kwarteng, K. (2021) Letter from Chancellor Rishi Sunak and Business Secretary Kwasi Kwarteng to businesses on the government's Plan for Growth. *Department for Business, Energy & Industrial Strategy and HM Treasury*. Available at: <https://www.gov.uk/government/publications/letter-from-chancellor-rishi-sunak-and-business-secretary-kwasi-kwarteng-to-businesses-on-the-governments-plan-for-growth/letter-from-chancellor-rishi-sunak-and-business-secretary-kwasi-kwarteng-to-businesses-on-the-governments-plan-for-growth> . Accessed on 11/07/2022.

The National Archives (1998) Regional Development Agencies Act 1998. Available at: <https://www.legislation.gov.uk/ukpga/1998/45/contents> . Accessed on: 25/07/2022.

UCL (University College London) (2017). Mazzucato cited in parliamentary committee report on industrial strategy. *UCL Home, The Bartlett*. Available at: <https://www.ucl.ac.uk/bartlett/news/2017/mar/mazzucato-cited-parliamentary-committee-report-industrial-strategy>. Accessed on: 27/06/2022.

Wren, 2001

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Cambridge Industrial Innovation Policy (CIIP) is a global, not-for-profit policy group based at the Institute for Manufacturing (IfM), University of Cambridge. CIIP works with governments and global organisations to promote industrial competitiveness and technological innovation. We offer new evidence, insights and tools based on the latest academic thinking and international best practices.

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