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STRENGTH IN PLACES FUND EVALUATION

Baseline Report

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CONTENTS

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EXECUTIVE SUMMARY

INTRODUCTION

This Baseline Report aims to describe the state of the world before the Strength in Places Fund (SIPF) programme. It follows the Evaluation Framework Report, and precedes the interim and final Impact and Process Evaluation Reports that will be produced in future stages of the evaluation. The Baseline Report provides data and evidence that can be used to inform the Impact Evaluation, allowing for comparisons of key quantitative metrics and qualitative insights to be made to help address the impact evaluation questions set out in the Framework.

SIPF is a UK Research and Innovation (UKRI) competitive funding scheme that takes a 'place-based' approach to research and innovation (R&I) funding. SIPF was announced by the UK government in the 2017 Industrial Strategy White Paper as part of an ambition to address large regional disparities in productivity and economic growth across the country. Applicants from any sector were invited to apply but they were required to be consortia comprising both business and publicly-funded research organisations. The place-based nature of the fund is a key distinction between SIPF and other R&I funding programmes. Location and a commitment to build on existing regional strengths were primary considerations in the allocation of funding (alongside the usual requirements for research excellence and high-quality innovation).

Over two waves, a total of 12 projects were awarded SIPF funding (see Table 1).

TABLE 1 PROJECTS RECEIVING FULL SIPF FUNDING

#	PROJECT NAME	FIELD	ECONOMIC GEOGRAPHY	LEADING ORGANISATION	UKRI AWARD AMOUNT (£M)
Wave 1 projects (announced 2020)					
1	CS Connected	Semiconductor materials	South Wales	Cardiff University	25.4
2	Decarbonising Maritime Transportation	Zero emissions sailing	Belfast	Artemis Technologies	33.1
3	Smart Data Foundry (formally Global Open Finance Centre of Excellence)	Financial technology	Central Scotland	University of Edinburgh	22.5
4	The Living Laboratory	Precision medicine	Glasgow	University of Glasgow	38.1
5	Infection Innovation Consortium (iicon)	Infectious disease therapeutics	Liverpool and Cheshire	Liverpool School of Tropical Medicine	18.7
6	MyWorld	Creative media	Bristol and Bath	University of Bristol	30.0

#	PROJECT NAME	FIELD	ECONOMIC GEOGRAPHY	LEADING ORGANISATION	UKRI AWARD AMOUNT (£M)
7	Growing Kent and Medway	Climate-smart food production and processing	Kent and Medway	National Institute for Agricultural Botany EMR	17.9
Wave 2 projects (announced 2021)					
8	Advanced Machinery & Productivity Initiative	Advanced manufacturing	Yorkshire & the Humber / North West	NPL Management Ltd	22.6
9	Midlands Advanced Ceramics for Industry 4.0	Chemical industries and materials	West Midlands / East Midlands	Lucideon Group Limited	18.3
10	Digital Dairy Value-Chain for South-West Scotland and Cumbria	Agri-Tech, Food and drink	Scotland / North West	Scotland's Rural College (SRUC)	21.3
11	media.cymru	Creative economy	Wales	Cardiff University	22.2
12	SmartNanoNI	Electronics and photonics	Northern Ireland	Seagate Technology Ireland	42.4

Source: UKRI, Frontier Economics, RAND Europe and know.consulting
Note: See https://www.ukri.org/publications/strength-in-places-fund-funded-projects/ for further details of funded projects.

The impact evaluation is focussed on 15 evaluation questions across seven themes, as shown in Table 2. For each evaluation question, we have developed a number of indicators of success and metrics with which to measure them. By tracking these indicators through the delivery of SIPF, we will be able to understand the state of the world five years after SIPF funding was awarded to the projects. In order to understand the contribution that SIPF funding may have made to the various indicators – over and above what would have happened without the Fund being established – it is important to build a comprehensive picture of the state of the world before, or in the early stages of, the programme, i.e. the 'baseline' position. That is the focus of this report. Importantly, **this Baseline Report does not in itself constitute an evaluation of SIPF**. Data collected at later stages of the evaluation will be needed to draw conclusions.

Early drafts of this Baseline Report were reviewed by the SIPF External Evaluation Advisory Group (SEEAG), the SIPF Programme Board, the SIPF Evaluation Working Group (EWG), and the NPIF Evaluation Oversight Board (NEOB). These bodies provided helpful comments and input in a number of areas, including baselining methodology and available secondary quantitative data sources.

TABLE 2 IMPACT EVALUATION THEMES

	THEME	EVALUATION QUESTIONS
	Knowledge and innovation	**EQ1**: Did SIPF increase the regional quality and quantity of **academic research** in key research fields? To what extent was long-term capacity for such research increased? To what extent did this leverage existing local strengths? **EQ2**: Did SIPF increase the quantity and quality of regional **commercial R&I** in key industries? To what extent was long-term capacity for such R&I increased? To what extent did this leverage existing local strengths? **EQ3**: Have the technologies and new knowledge supported by SIPF progressed **innovations** and helped create new businesses? If not, why not? **EQ4**: Have the innovations, technologies and new knowledge supported by SIPF been **adopted** more widely? If so, how are they being used? If not, why not?
	Jobs and skills	**EQ5**: Did SIPF improve the **job prospects**, in terms of the number, variety and profile of jobs available within the targeted regions? If not, why not? **EQ6**: Did SIPF increase the **skills base** and/or alter the profile of skills in targeted regions? If not, why not?
	Economic impact	**EQ7**: Did SIPF funded-activities contribute to improved **economic performance**, particularly within targeted industries and regions? If so, was the improvement sustained? If not, why not? **EQ8**: Did SIPF contribute to **closing gaps** in economic performance across UK regions? If not, why not?
	Networks and collaboration	**EQ9**: Did SIPF enhance and sustain the nature of **collaboration** and the collaboration infrastructure within targeted industries, research fields and regions? If not, why not?
	Societal impact	**EQ10**: Was the **reputation** for R&I of targeted regions and sectors enhanced as a result of the SIPF funding and outputs? If not, why not? **EQ11**: To what extent (and how) have SIPF projects fostered **equal, diverse and inclusive** research and business environments, and how well do SIPF projects align with UKRI ED&I aims? **EQ12**: Did the outputs of SIPF improve the **health, wellbeing and environment** of individuals in targeted regions?
	Policy design	**EQ13**: To what extent has the **evidence base** around the impact of locally targeted R&I spending in the UK been improved? **EQ14**: Did the learnings from SIPF influence and improve the design of R&I **policy**?

	THEME	EVALUATION QUESTIONS
	Value for money	**EQ15**: To what extent does SIPF represent **value for money** given the overall impact on knowledge, economy and society relative to the size of the investment?

Source: Frontier Economics, RAND Europe and know.consulting

BASELINE METHODOLOGY AND EVIDENCE SOURCES

To understand the baseline before/in the early stages of SIPF, we draw on both quantitative and qualitative evidence sources.

As part of the Evaluation Framework Report, we identified 24 secondary quantitative data sources that we considered potentially relevant to the evaluation. These data sources were identified on the basis of a preliminary review and audit of the content and quality of available data sources. In preparing this Baseline Report, we investigated these data sources further to assess in more detail their potential for use in the evaluation and quantitative baselining. We found that there were only a limited number of sources are available at a useful level of geographic and industrial granularity. Even where datasets could be disaggregated by both geography and sector, in many cases the granularity of the data was only sufficient for providing broad regional/sectoral trends, likely too broad to expect to see strong evidence of quantitative impact (certainly within the lifetime of the current SIPF programme). Even for the finest granularity data, the activity of the individual SIPF projects is likely to be small relative to the totality of economic activity in a particular sector and region, making quantitative identification of impacts challenging.

While broad regional/sectoral trends may not be sufficiently granular metrics to measure the impact of SIPF projects in themselves, this trend data can still be helpful for contextualising primary project level data and other evaluation evidence. We have therefore included some such data within our baselining. The short list of secondary quantitative data sources used for the quantitative baselining is summarised in Table 3 below.

TABLE 3 SECONDARY QUANTITATIVE DATA SOURCES

DATA SOURCE	METRICS
Dimensions.ai	Publications, citations, Field Citation Ratio (FCR), industry publications, and policy citations, by postcode and subject area
HESA Finance Data	Income from research grants and contracts by HE provider and HESA cost centre (£ thousands)
HESA Business and Community Interaction Data (HE-BCI)	Intellectual property spin-off activities by HE provider and number of new patents applications filed in year
Apprenticeships and Traineeships Data - UK Government	Apprenticeship participation by region and sector
Business Enterprise Research and Development Data (BERD)	Employment and expenditure on R&D performed in UK businesses by product group

DATA SOURCE	METRICS
Annual Survey of Hours and Earnings (ASHE)	Median weekly gross pay for full time employees (£) by sector and region
Business Structure Database (BSD)	Employment and turnover by SIC code and postcode
Annual Business Survey (ABS)	Gross Value Added (GVA) by region and SIC code

Many of the metrics identified in the Evaluation Framework rely wholly or partly on qualitative views. In order to provide a baseline position for these metrics, we undertook an extensive qualitative engagement process for this Baseline Report, involving:

1 Semi-structured interviews with SIPF projects;

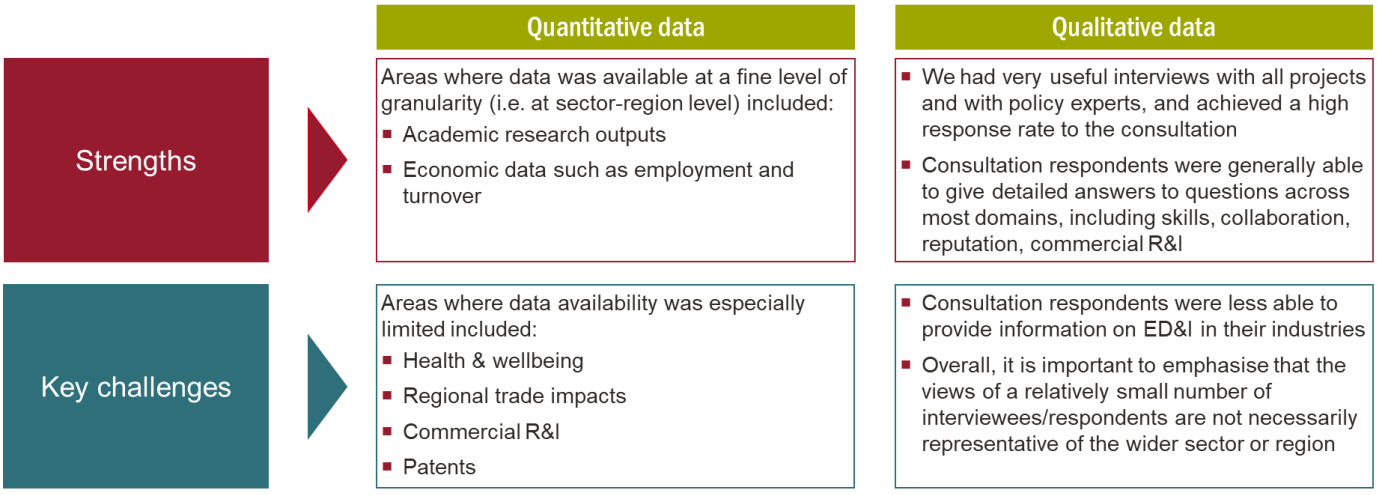
2 Semi-structured interviews with policy makers and experts; and

3 An email-based consultation process with regional/sectoral experts.

BASELINE FINDINGS

Overall, we collected a large volume of useful baseline data, the details of which are presented in the main body of this Baseline Report. Figure 1 provides a summary of the key strengths and challenges associated with the data we have (or have not) collected.

FIGURE 1 SUMMARY OF THE STRENGTHS AND CHALLENGES OF THE BASELINE DATA



Source: Frontier Economics, RAND Europe and know.consulting

On the quantitative side, relatively fine granularity data was available relating to academic research outputs, including publications, citations, and industry co-authored publications outputs by postcode and subject classification. Fine granularity data on employment and turnover by was also available (by postcode and five digit SIC code). Although less granular, quantitative data split by both region and sector was also collected relating to: R&I income of higher education provider partners of SIPF projects; apprenticeships and CPD courses; and median wages and productivity (GVA per worker).

While we have collected contextual data on R&D expenditure and employment by sector, there was generally limited data available at a useful granularity covering commercial R&I and patents. There was also limited data available at a useful granularity relating to trade and regional imports/exports. Secondary data on health, wellbeing and the environment in SIPF supported regions at sufficiently disaggregated level was very limited. However, we include some high-level geographical information from the Levelling Up White Paper. For evaluation questions relating to these areas, the evaluation will need to rely mostly on primary evidence (in particular qualitative assessment) at the Fund-level, as well as evidence gathered through project-level evaluations.

On the qualitative side, interviews with the individual SIPF projects and policy experts, along with responses to our consultation, provided valuable insights into the baseline level of skills, collaboration, commercial R&I and local industry reputation in each of the SIPF project regions. However, we were less able to solicit qualitative evidence on the baseline level of equality, diversity and inclusion (ED&I) outcomes within the SIPF project sectors and regions.

Below, we set out some of the main themes emerging from the quantitative and qualitative data we have collected.

QUANTITATIVE BASELINE DATA

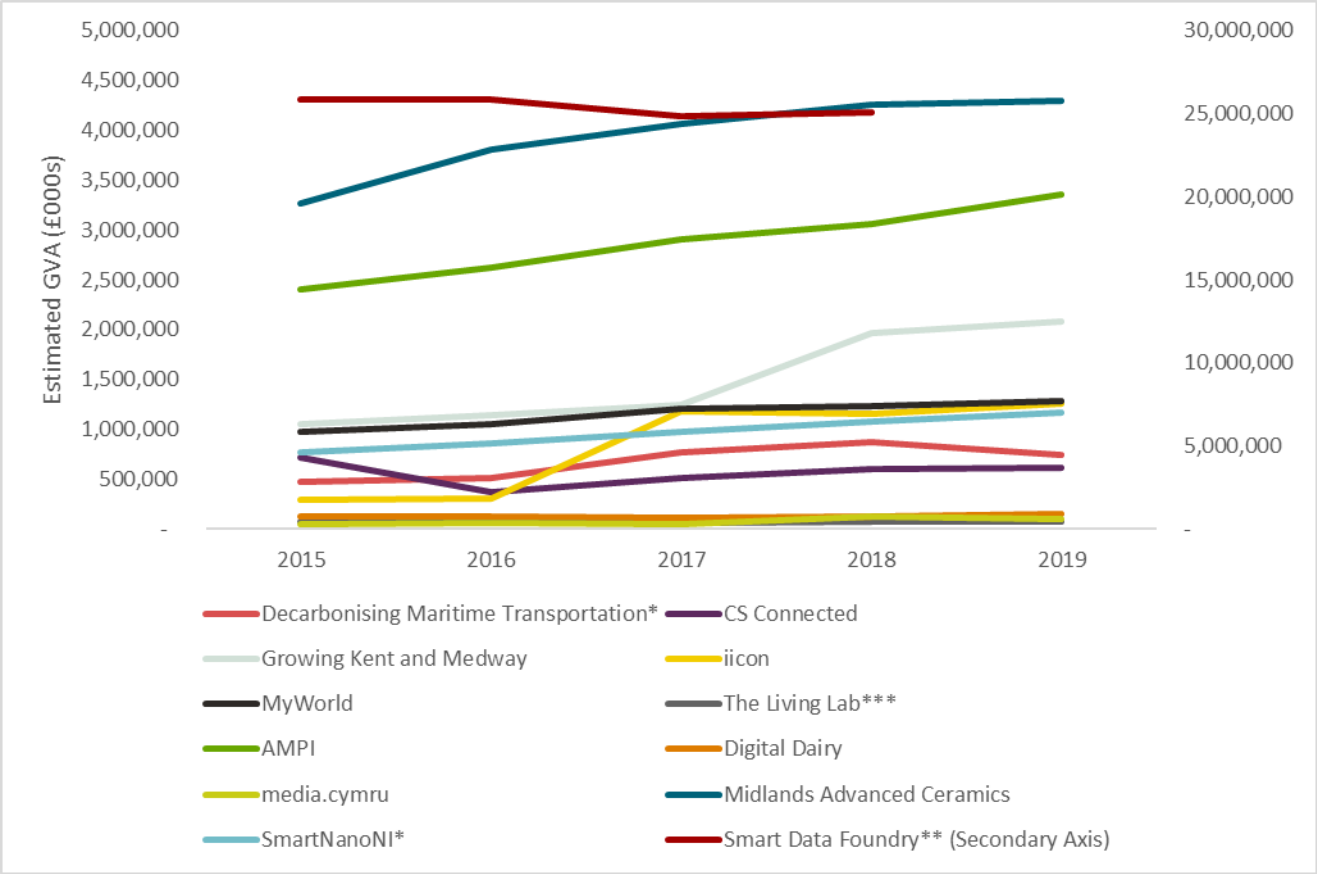
A key theme across most of the quantitative metrics we have collected is considerable variability between projects. This partly reflects the baseline level of economic activity in each project's respective sector-region but also reflects differences in the geographic and sectoral scope of the projects. For example:

- Smart Data Foundry covers the majority of financial and insurance activities in and around Edinburgh. This is a large industry associated with over 200,000 jobs.
- Midlands Advanced Ceramics covers engineering research, testing and consulting activities across a very large geographic area in the midlands (the largest project region).
- Other projects cover smaller regions or have sectors defined more specifically within the Standard Industrial Classification (SIC) system, e.g. Decarbonising Maritime Transportation, media.cymru, and The Living Lab.
- For academic outputs, projects related to medical sciences (the Living Laboratory and Infection Innovation Consortium) generally have much higher publication rates.

Where projects are smaller relative to the totality of economic and research activity in their respective sector-region, this will make quantitative identification of impacts more challenging.

Another key theme identified is that, in terms of broads trends in economic activity (employment, turnover, GVA), most projects' sector-regions have been relatively stable over the baseline period, 2015 to 2019, exhibiting a slight upward trends. For example, Figure 2 below shows estimated the gross value added (GVA) of the project sector-regions, based on GVA to employment ratios.

FIGURE 2 ESTIMATED GVA OF PROJECT SECTOR-REGIONS (BASED ON GVA TO EMPLOYMENT RATIOS)



Source: ONS (BSD and ABS) and OECD

Notes: Figure shows estimated Gross Value Added (GVA) by project 'sector-region'. GVA is estimated my multiplying sector-region employment (as recorded in the Business Structure Database) and the sector-region GVA to employment ratio (as recorded in the Annual Business Survey). Sector-region is identified in the Business Structure Database by the SIC07 five digit codes and partial post code areas covered by each project. Sector-region is identified in the Annual Business Survey by the SIC07 two digit codes and NUTS3 areas covered by each project (apart from the exceptions below).
** Northern Ireland is not covered by the Annual Business Survey. For projects in Northern Ireland, the GVA to employment ratio is calculated in the Annual Business Survey by project sector only.*
*** The financial sector is not covered by the Annual Business Survey. For the financial sector project Smart Data Foundry, the GVA to employment ratio reported is GVA in financial and insurance activities per worker in Scotland, taken from the OECD Regional Economy dataset (data for 2019 not yet available).*
**** Due to limited coverage of The Living Lab sector-region in the ABS, the GVA to employment ratio is calculated in the ABS by project region only.*

QUALITATIVE BASELINE DATA

A selection of baseline findings from the evaluation themes which relied more heavily on qualitative data collection are reported below. Although these views are helpful for building the baseline picture, it is important to note that the views of the individuals who responded to the consultation or participated in an interview do not necessarily represent those of the wider region or sector.

- **Jobs and skills.** Our qualitative baselining exercises revealed a large number of perceived skills gaps in SIPF-funded sectors. For example, the respondents described a need for increased technical skills of all kinds. This includes STEM skills, in general, with several stakeholders highlighting gaps in science (particularly physics and data science) and engineering, and PhD-level graduates. In the maritime sector, we were told of skills gaps around electrification, clean technologies, autonomy maritime design and naval architecture.

- **Networks and collaboration.** From the consultation, we found that the perceived nature of collaboration between stakeholders at baseline varied considerably between regions and sectors.

For example, we found evidence of well-established networks for collaboration across the life sciences sector in the Liverpool City Region (LCR), such as the LCR Health and Life Sciences Board (administered by the LEP). On the other hand, we were told of limited collaboration in several industries, where it was often described as bilateral, e.g. between one industrial and one academic partner, and on a project-by-project basis (less strategic).

- **Societal impact.** Regarding equality, diversity and inclusion, at a very high level, there was consensus across consultation respondents that inequalities exist in their industries, for example, in terms of representation of women, ethnic minorities, and people from different parts of the UK and with different socioeconomic backgrounds.

- **Policy design.** In general, interviewees characterised the knowledge base as 'incomplete', which echoes the findings of our Rapid Evidence Review in the Evaluation Framework Report. An interviewee from the UK government stated that: 'fundamentally, we don't have a comprehension of the real impact of place-based vs excellence based funding criteria'. They added that a benefit of SIPF is that it is testing the effectiveness of a combined approach of funding universities and businesses together.

CONCLUSIONS

This report aims to build a picture of the 'state of the world' before, or in the early stages of, the SIPF programme. We combine quantitative and qualitative sources to summarise the baseline position for all evaluation questions and indicators for which data is available. These will provide points of comparison for the Fund-level impact evaluation being conducted through later phases of the evaluation between 2023 and 2026.

Only a limited number of secondary data sources are available split simultaneously by both region and sector such that association of the data with individual SIPF projects is feasible. Examples of such data sources include academic output data (from Dimensions.ai), academic R&I funding (from HESA Finance Data) and economic data on employment and turnover (from the Business Structure Database). However, even where datasets can be disaggregated by both geography and sector, in many cases, the granularity of the data is only sufficient for providing broad trends. Even for the finest granularity data, the activity of the individual SIPF projects is likely to be small relative to the totality of economic activity in a particular sector and region, making quantitative identification of impacts challenging. These challenges highlight the importance of qualitative evidence and primary data collected through project-level evaluations for informing the Fund-level evaluation (and assessment of value for money), re-affirming the approach developed in the Evaluation Framework Report. While broad regional/sectoral trends may not be sufficiently granular metrics to measure the impact of SIPF projects in themselves, this trend data can still be helpful for contextualising primary project-level data and other evaluation evidence. In terms of trends in economic activity metrics, we find that most projects' sector-regions have exhibited slight upward trends of varying degrees over the baseline period, 2015 to 2019.

From the interviews, we found that Policy stakeholders are generally positive about SIPF as an experiment in place-based policy-making, as the knowledge base in this area is generally considered incomplete. A challenge for future phases of evaluation will be teasing out the role of SIPF in influencing R&I policy, given that our evidence suggests that the culture has already changed rapidly towards more regional-focused growth (most obviously as part of the Levelling Up agenda) and that there are a range of other place-based R&I initiatives being delivered, albeit not at the same scale as SIPF.

1 INTRODUCTION

This Baseline Report aims to describe the state of- the world before the Strength in Places Fund (SIPF) programme. It follows the Evaluation Framework Report, and precedes the interim and final Impact and Process Evaluation Reports that will be produced in future stages of the evaluation. The Baseline Report provides data and evidence that can be used to inform the Impact Evaluation, allowing for comparisons of key quantitative metrics and qualitative insights to be made to help address the impact evaluation questions set out in the Framework.

1.1 SUMMARY OF THE STRENGTH IN PLACES FUND

SIPF is a UK Research and Innovation (UKRI) competitive funding scheme that takes a 'place-based' approach to research and innovation (R&I) funding. SIPF was announced by the UK government in the 2017 Industrial Strategy White Paper as part of an ambition to address large regional disparities in productivity and economic growth across the country. The programme forms part of the wider National Productivity Investment Fund (NPIF) that will be contributing to the government's target to reach 2.4% of GDP investment in research and development (R&D) by 2027[1] (UKRI, 2020).

SIPF aims to:

- Support innovation-led regional growth
- Enhance local collaborations involving research and innovation.

Through SIPF, funding awards of between £10 million and £50 million are available for R&I programmes lasting between three and five years. Applicants from any sector were invited to apply but they were required to be consortia comprising both business and publicly-funded research organisations. The projects must be focused on a specific (self-defined) economic geography with a plan to achieve demonstrable impact on local economic growth.[2]

The place-based nature of the fund is a key distinction between SIPF and other R&I funding programmes. Location and a commitment to build on existing regional strengths were primary considerations in the allocation of funding (alongside the usual requirements for research excellence and high-quality innovation). As a result, as set out in the Evaluation Framework, the success of SIPF will necessarily be assessed, in part, on how far it has affected the distribution of economic outcomes rather than just a 'national average', particularly in those areas targeted for support, and the way the place-based and excellence lenses of the Fund interact (compared with the usual agnostic consideration of place), in terms of both delivery process and impact.

SIPF funding was awarded in two Waves. In Wave 1, 23 projects were awarded up to £50,000 of seedcorn funding to develop their proposals. In 2020, seven of these were selected for full funding (see Table 4). Total funding for Wave 1 was £187 million. In Wave 2, 17 projects were awarded seedcorn funding. In May

[1] UKRI SIPF Programme Overview (2020)

[2] https://www.ukri.org/our-work/our-main-funds/strength-in-places-fund/

2021, a further five projects were selected for full funding. Total funding for Wave 2 was £127 million. Table 4 provides details of the 12 funded projects across two Waves.

In January 2021, the Evaluation Consortium (Frontier Economics, RAND Europe and know.consulting) were appointed as the Fund-level evaluators for SIPF, with Frontier Economics as the lead partner. The evaluation of SIPF will continue for the duration of the funding, aiming to complete at the end of 2026.

TABLE 4 PROJECTS RECEIVING FULL SIPF FUNDING

#	PROJECT NAME	FIELD	ECONOMIC GEOGRAPHY	LEADING ORGANISATION	KEY GRANT RECEIVING PARTNERS	START DATE	EXPECTED COMPLETION DATE	UKRI AWARD AMOUNT (£M)
Wave 1 projects (announced 2020)								
1	CS Connected	Semiconductor materials	South Wales	Cardiff University	Swansea University; Compound Semiconductor Applications Catapult; Compound Semiconductor Centre Ltd	Nov 2020	May 2025	25.4
2	Decarbonising Maritime Transportation	Zero emissions sailing	Belfast	Decarbonising Maritime Transportation Technologies	Bombardier Aerospace; Queens University; Ulster University	Sep 2020	Apr 2024	33.1
3	Smart Data Foundry (formally Global Open Finance Centre of Excellence)	Financial technology	Central Scotland	University of Edinburgh	Fintech Scotland; Financial Data & Technology Association; Royal Bank of Scotland	Aug 2020	Jul 2025	22.5
4	The Living Laboratory	Precision medicine	Glasgow	University of Glasgow	NHS Greater Glasgow and Clyde; Bioclavis; MR Coiltech Ltd	Oct 2020	Sep 2025	38.1
5	Infection Innovation Consortium (iicon)	Infectious disease therapeutics	Liverpool and Cheshire	Liverpool School of	AMR Centre Ltd; University of Liverpool; Royal	Sep 2020	Aug 2025	18.7

#	PROJECT NAME	FIELD	ECONOMIC GEOGRAPHY	LEADING ORGANISATION	KEY GRANT RECEIVING PARTNERS	START DATE	EXPECTED COMPLETION DATE	UKRI AWARD AMOUNT (£M)
				Tropical Medicine	Liverpool and Broadgreen Hospital Trust			
6	MyWorld	Creative media	Bristol and Bath	University of Bristol	University of Bath; University of the West of England; Digital Catapult	Apr 2021	Mar 2026	30.0
7	Growing Kent and Medway	Climate-smart food production and processing	Kent and Medway	National Institute for Agricultural Botany EMR	University of Kent; NRI-University of Greenwich; Locate in Kent Ltd	Oct 2020	Sep 2025	17.9
	Wave 2 projects (announced 2021)							
8	Advanced Machinery & Productivity Initiative	Advanced manufacturing	Yorkshire & the Humber / North West	NPL Management Ltd	University of Huddersfield; University of Salford; Wayland Additive Limited	Feb 2022	Apr 2026	22.6
9	Midlands Advanced Ceramics for Industry 4.0	Chemical industries and materials	West Midlands / East Midlands	Lucideon Group Limited	Loughborough University; University of Birmingham; University of Leicester	Oct 2021	Jun 2025	18.3
10	Digital Dairy Value-Chain for South-West Scotland and Cumbria	Agri-Tech, Food and drink	Scotland / North West	Scotland's Rural College (SRUC)	University of Strathclyde; University of West Scotland; CENSIS	Feb 2022	Oct 2026	21.3

#	PROJECT NAME	FIELD	ECONOMIC GEOGRAPHY	LEADING ORGANISATION	KEY GRANT RECEIVING PARTNERS	START DATE	EXPECTED COMPLETION DATE	UKRI AWARD AMOUNT (£M)
11	media.cymru	Creative economy	Wales	Cardiff University	Cardiff Metropolitan University; Great Point Media; Gorilla	Jan 2022	Jan 2026	22.2
12	SmartNanoNI	Electronics and photonics	Northern Ireland	Seagate Technology Ireland	Digital Catapult N.I.; Causeway Sensors; Yelo Ltd	Dec 2021	Jul 2026	42.4

Source: UKRI, Frontier Economics, RAND Europe and know.consulting

Note: Key partner organisations defined as the three organisations other than the lead receiving the largest share of total funding from UKRI. See https://www.ukri.org/publications/strength-in-places-fund-funded-projects/ for further details of funded projects.

1.2 AIMS OF THE SIPF EVALUATION

The Fund-level evaluation aims to build an evidence base to judge the success and overall impact of SIPF. It includes both **process evaluation**, seeking to understand what has worked well and less well in the design and delivery of the Fund and making recommendations for changes to delivery process; and an **impact evaluation** to understand what SIPF has achieved and provide early evidence on Value for Money (VfM). The scope of the evaluation covers the Wave 1 and Wave 2 projects.

The SIPF-wide evaluation will be completed in parallel with project-level impact evaluations. Each of the 12 funded projects have or will develop and implement individual evaluations, including project-specific logic models, evaluation questions, success metrics and key performance indicators (KPIs). The SIPF-wide evaluation will draw on data and evidence gathered by project-level evaluations, but will go beyond simply aggregating project-level evaluations in order to provide a Fund-wide assessment of impact, by also analysing Fund-wide monitoring data, secondary data and primary quantitative and qualitative data. The Evaluation Consortium will work closely with project-level evaluation teams to ensure synergies are identified and that the evidence gathered in project-level evaluations will be useful for the Fund-level evaluation.

SIPF represents a pathfinder for place-based funding policy within UKRI. As such, the evaluation also aims to provide further evidence on the effectiveness of place-based R&I funding for future-policy-making. While the evaluation will, necessarily, only be able to comment on the particular mechanism adopted by SIPF (competitive tendering with a clear place-based portfolio allocation as part of the decision-making process), given the relatively limited evidence on place-based R&I policy identified in our evidence review for the Evaluation Framework, the findings should make an important contribution to understanding.

1.3 SUMMARY OF THE EVALUATION FRAMEWORK

The Fund-level Evaluation Framework Report was completed by the Evaluation Consortium in July 2021. This underpins all future stages of evaluation and includes:

- The **theory of change** (ToC), linking what SIPF is doing (inputs and activities) to what it will deliver (the outputs) and the benefits that will be realised in the shorter- and longer-terms (outcomes and impacts).
- The **logic model**, which is a visual representation of the ToC.
- The **process map**, setting out a detailed pathway of processes involved in the design, administration, running and monitoring of SIPF across both waves and the different stages of funding.
- The **evaluation questions** (covering both process and impact evaluations), with specific metrics and data sources identified to track and measure success.
- The **evaluation methodology** (covering both process and impact evaluations), setting out how evidence to answer the questions will be obtained and analysed.
- Key **timelines** for future phases of the evaluation.
- Potential **risks** and mitigation strategies.

The approach to this Baseline Report was informed by and agreed on as part of the Evaluation Framework, and therefore should be read in parallel with the Framework. To help contextualise the findings in the

Baseline Report, the following sections summarise the parts of the Evaluation Framework most relevant for the baseline analysis.

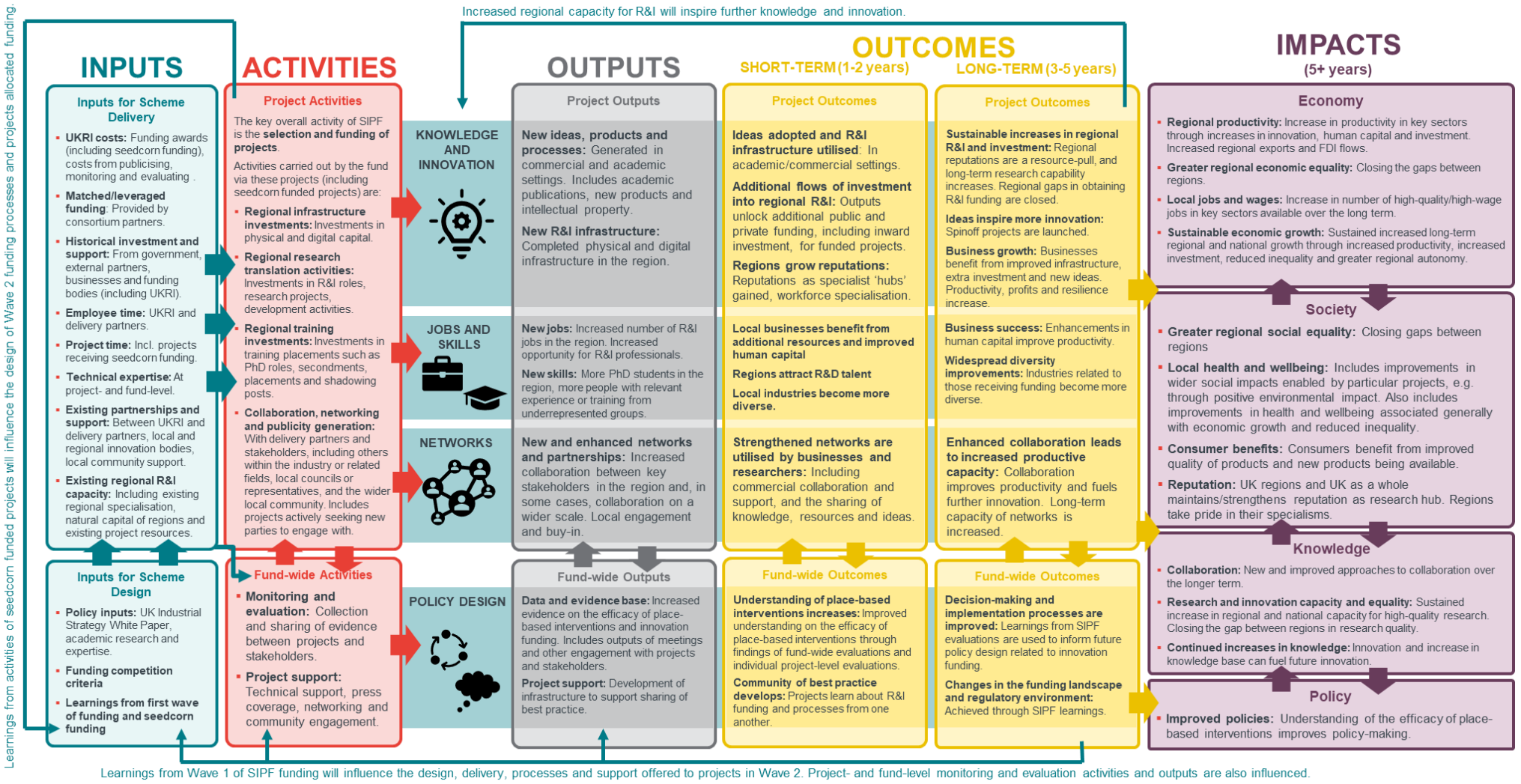
1.3.1 SIPF THEORY OF CHANGE AND LOGIC MODEL

The ToC captures the theory of how the intervention is expected to work, setting out the steps expected to be involved in achieving the desired outcomes, the assumptions made and wider contextual factors. Developing a ToC typically involves considering the proposed inputs (the investment/regulation/actions that will take place) and the causal chain that leads from these inputs to the expected outputs and outcomes. A **logic model** is a visual representation of the ToC that can be rapidly understood and disseminated.

The SIPF Fund-wide logic model is shown in Figure 3. It contains inputs (for both programme *design* and programme *delivery*), activities, outputs, outcomes (both *short-term* and *long-term*) and impacts (across the areas of *Economy, Society, Knowledge* and *Policy*, aligned with UKRI strategic objectives). From activities onwards, the model is split into two distinct strands: **project-level** elements and **Fund-wide** elements. The project-level elements are those which flow through the projects and are therefore dependent on the specific projects that are funded. The Fund-wide elements relate to two key activities of SIPF: supporting the projects in achieving their aims, and building an understanding around place-based policy and its effectiveness.

Further narrative details of the ToC – including interactions and feedback loops, timescales, external barriers and enablers, and assumptions – can be found in Section 3.2 of the Evaluation Framework Report.

FIGURE 3 SIPF LOGIC MODEL



1.3.2 IMPACT EVALUATION THEMES AND QUESTIONS

Drawing on the logic model and theory of change, we developed seven broad themes for the impact evaluation.[3] These themes form the organising structure of 15 impact evaluation questions, as shown in Table 5. For each evaluation question, we have developed a number of indicators of success and metrics with which to measure them (see Section 4.2 of the Evaluation Framework Report).

TABLE 5 IMPACT EVALUATION THEMES

	THEME	THEME DETAIL	EVALUATION QUESTIONS
	Knowledge and innovation	This theme considers the extent to which SIPF has contributed to creating new ideas, products, processes, as well as infrastructure for R&I.	**EQ1**: Did SIPF increase the regional quality and quantity of **academic research** in key research fields? To what extent was long-term capacity for such research increased? To what extent did this leverage existing local strengths? **EQ2**: Did SIPF increase the quantity and quality of regional **commercial R&I** in key industries? To what extent was long-term capacity for such R&I increased? To what extent did this leverage existing local strengths? **EQ3**: Have the technologies and new knowledge supported by SIPF progressed **innovations** and helped create new businesses? If not, why not? **EQ4**: Have the innovations, technologies and new knowledge supported by SIPF been **adopted** more widely? If so, how are they being used? If not, why not?
	Jobs and skills	This theme relates to the Fund's objectives to increase the number of R&I jobs in the SIPF regions and the number of individuals developing R&I skills.	**EQ5**: Did SIPF improve the **job prospects**, in terms of the number, variety and profile of jobs available within the targeted regions? If not, why not? **EQ6**: Did SIPF increase the **skills base** and/or alter the profile of skills in targeted regions? If not, why not?
	Economic impact	This theme considers the extent to which SIPF has delivered substantive long-term	**EQ7**: Did SIPF funded-activities contribute to improved **economic performance**, particularly within

[3] The Evaluation Framework Report also contains a detailed approach to the planned process evaluation. However the process evaluation does not require baselining, and so we do not include information relating to the process evaluation in this report.

	THEME	THEME DETAIL	EVALUATION QUESTIONS
		benefits for the economy, including regional productivity and economic equality.	targeted industries and regions? If so, was the improvement sustained? If not, why not? **EQ8**: Did SIPF contribute to **closing gaps** in economic performance across UK regions? If not, why not?
	**Networks and collaboration**	This theme relates to the Fund's objectives to create new and enhanced networks and partnerships between key stakeholders in the regions where funded projects are located.	**EQ9**: Did SIPF enhance and sustain the nature of **collaboration** and the collaboration infrastructure within targeted industries, research fields and regions? If not, why not?
	**Societal impact**	This theme considers the extent to which SIPF has delivered long-term benefits for society, including local health and wellbeing, and equality diversity and inclusion (EDI).	**EQ10**: Was the **reputation** for R&I of targeted regions and sectors enhanced as a result of the SIPF funding and outputs? If not, why not? **EQ11**: To what extent (and how) have SIPF projects fostered **equal, diverse and inclusive** research and business environments, and how well do SIPF projects align with UKRI ED&I aims? **EQ12**: Did the outputs of SIPF improve the **health, wellbeing and environment** of individuals in targeted regions?
	**Policy design**	This covers the Fund-wide objective to increase the data and evidence base around place-based funding and therefore improve future policy-making.	**EQ13**: To what extent has the **evidence base** around the impact of locally targeted R&I spending in the UK been improved? **EQ14**: Did the learnings from SIPF influence and improve the design of R&I **policy**?
	**Value for money**	This theme considers the extent to which the benefits that can be attributed to SIPF constitute value when compared to the costs of the Fund.	**EQ15**: To what extent does SIPF represent **value for money** given the overall impact on knowledge, economy and society relative to the size of the investment?

Source: Frontier Economics, RAND Europe and know.consulting

1.4 PURPOSE OF THE BASELINE REPORT

As summarised above, the impact evaluation will be structured around indicators (organised into Evaluation Questions). By tracking these indicators through the delivery of SIPF, we will be able to understand the state of the world five years after SIPF funding was awarded to the projects. In order to

understand the contribution that SIPF funding may have made to the various indicators – over and above what would have happened without the Fund being established – it is important to build a comprehensive picture of the state of the world before, or in the early stages of, the programme, i.e. the 'baseline' position. That is the focus of this report.

Importantly, **the Baseline Report does not in itself constitute an evaluation of SIPF**. Data collected at later stages of the evaluation will be needed to draw conclusions. However, some of the metrics and data gathered as part of the baseline do contain early insights into the perceived impact of SIPF to-date.

1.5 STRUCTURE OF THE BASELINE REPORT

The remainder of the Baseline Report is structured as follows:

- Section 2 outlines the baseline methodology (qualitative and quantitative) and describes the evidence sources used.
- Section 3 reports the baseline results, organised by evaluation theme and evaluation question.
- Section 4 provides some conclusions and describes the next steps.

We also provide Annexes providing details of our evaluation of possible secondary data sources, past investment received by projects, the research instruments used to gather evidence to support this Baseline Report, and evidence on the views of SIPF projects on the feasibility of using sector-region counterfactuals as part of the impact evaluation methodology.

This version of the Baseline Report is an update to a previous version produced in January 2022. The key revisions are: 1) including evidence relating Wave 2 projects, as well as Wave 1 projects, 2) incorporating data from a number of secure-access ONS sources and 3) incorporating information on past UKRI investments and geographical data from the Levelling Up White Paper.

1.6 GLOSSARY OF KEY TERMS AND ACRONYMS

Table 6 provides a glossary of key terms, acronyms and other relevant jargon relating to SIPF to help with the interpretation of this Baseline Report.

TABLE 6 GLOSSARY

TERM	EXPLANATION
ABS	Annual Business Survey
ASHE	Annual Survey of Hours and Earnings
BEIS	Department for Business, Energy and Industrial Strategy
BERD	Business Enterprise Research and Development
DHSC	Department of Health and Social Care
BSD	Business Structure Database
CA	Contribution Analysis

TERM	EXPLANATION
CPD	Continuing Professional Development
EC	Evaluation Consortium
ED&I / EDI	Equality, Diversity and Inclusion (sometimes Equity)
EoI	Expression of Interest
EQ	Evaluation Question
EWG	Evaluation Working Group for the Strength in Places Fund
FDATA	Financial Data and Technology Association
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GVA	Gross Value Added, used to measure the output of a particular sector
HE-BCI	Higher Education – Business Community Interaction
HEFCW	Higher Education Funding Council for Wales
HEP / HE Provider	Higher Education Provider
HESA	Higher Education Statistics Agency
HMRC	Her Majesty's Revenue and Customs
IFS	Innovation Funding Service
IUK	Innovate UK
KEF	Knowledge Exchange Framework
KPI	Key Performance Indicator
LAD	Local Authority District
LCR	Liverpool City Region
LEP	Local Enterprise Partnership
Logic model	A visual representation of the theory of change (ToC)
MHCLG	Ministry of Housing, Communities & Local Government
NEOB	NPIF Evaluation Oversight Board
NPIF	National Productivity Investment Fund
OLS	Office for Life Sciences
ONS	Office for National Statistics
QALY	Quality Adjusted Life Year, an outcome measure for health impact
RE	Research England
REA	Rapid Evidence Assessment, a form of desk review designed to provide quick insights on a topic from existing research

TERM	EXPLANATION
REF	Research Excellence Framework
ResearchFish	An online reporting system used by funders to collect information on the outcomes and the impact of their research. All SIPF projects are required to complete ResearchFish returns.
R&D	Research and Development
R&I	Research and Innovation
SEEAG	SIPF External Evaluation Advisory Group
Seedcorn funding	Funds to initiate and develop ideas for projects before receiving the full investment award.
SFC	Scottish Funding Council
SIC	Standard Industrial Classification (sectoral coding)
SIPF	Strength in Places Fund
SRO	Senior Responsible Officer
SRS	Secure Research Service (ONS secure data environment)
SSAT2	Sector Subject Area Tier 2
ToC	Theory of Change
UKRI	UK Research and Innovation
VfM	Value for Money
Wave 1 / Wave 2	SIPF projects were awarded in two Waves: seven projects funded in Wave 1 (announced in 2020) and five in Wave 2 (announced in 2021)
WECA	West of England Combined Authority
WIN	Wales Innovation Network

Source: Frontier Economics, RAND Europe and know.consulting

1.7 ONS DATA DISCLAIMER

This work was produced using statistical data from ONS. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

2 BASELINE METHODOLOGY AND EVIDENCE SOURCES

To understand the baseline before/in the early stages of SIPF, we draw on both qualitative and quantitative evidence sources. Our findings are organised by evaluation theme, question and indicator, presenting results as a mix of data tables, summary of qualitative insights and quotes, depending on the range of sources used for each indicator.

Not all indicators have been baselined. This is because some indicators, particularly those focused on activities or outputs of the Fund, rely on data and evidence that will be collected through project-level evaluations and/or Fund-wide monitoring data. These indicators do not have a 'baseline' since they reflect what the Fund itself is delivering – in effect, the baseline is zero. An example of such an indicator is adoption of new innovations coming out of the SIPF projects.

In developing the baseline, we also needed to agree a **baseline period.** SIPF Wave 1 projects were launched during 2020 and 2021, and SIPF Wave 2 projects were launched during 2021 and 2022. From early 2020, there was large-scale disruption to all types of organisations due to the Covid-19 pandemic, affecting business and research capabilities across all sectors. In addition, the UK formally left the European Union in January 2021, which has further disrupted employment, trade and demand for goods/services.

To avoid misattributing the impacts of SIPF, we have therefore elected to use the **pre-Covid and pre-Brexit period (2019 or 2019/20) for the SIPF baselining exercise**.[4] The speed of recovery from both economic 'shocks' will be important in determining the overall feasibility of isolating the impact of SIPF on the indicators of interest. This choice of baseline period is also appropriate given the start date of Wave 1 projects. Where quantitative data are available before and after the baseline period, we present key trends to provide relevant pre-SIPF data and any early insight into how metrics varied in the first year of the pandemic.

2.1 QUANTITATIVE EVIDENCE SOURCES

As part of the Evaluation Framework Report, we identified 24 secondary quantitative data sources that we considered potentially relevant to the evaluation. These datasets were identified on the basis of a preliminary review and audit of the content and quality of available data sources.

As part of the baselining phase, we have investigated these data sources further to assess in more detail their potential for use in the evaluation and quantitative baselining. Our detailed review of the 24 identified secondary data sources considered the following factors:

- the specific variables of interest available in the data relating to the evaluation metrics;
- geographic and industrial disaggregation and feasibility of mapping to SIPF projects;
- time-coverage;
- frequency of publication;
- data quality and methodology; and

[4] Where possible, we will also consider baseline 'trends' in quantitative metrics over 2015-2019 (inclusive).

- cost or any other issues with data access.

This information was used to identify the most useful data sources for the baseline and impact evaluation; to identify gaps in the secondary data and strategies for dealing with these gaps; and to refine our understanding of the type and granularity of quantitative analysis that is feasible given available data.

As noted in the Evaluation Framework Report, where we plan to use secondary data mapped to areas and sectors funded by SIPF (and potential counterfactual areas), we need to consider whether data are available at a sufficient level of granularity to align with the definitions of place or sector within each SIPF project (see Section 3.9).

Our review of the available data sources has found that there are only a limited number of secondary data sources that are available at a useful level of geographic and industrial granularity and that secure-access versions of data are generally needed for datasets with the finest granularity. Even where datasets can be disaggregated by both geography and sector, in many cases the granularity of the data is only sufficient for providing broad regional/sectoral trends, likely too broad to expect to see strong evidence of quantitative impact (certainly within the lifetime of the current SIPF programme). Even for the finest granularity data, the activity of the individual SIPF projects is likely to be small relative to the totality of economic activity in a particular sector and region, making quantitative identification of impacts challenging.

These challenges highlight the importance of qualitative evidence and primary data collected through project-level evaluations for informing the fund level evaluation (and assessment of value for money), re-affirming the approach developed in the Evaluation Framework Report. In the Section 3, below, we highlight the tables where these issues are particularly acute. This includes those derived from large-scale administrative or survey datasets of households and businesses held securely by ONS, such as the Business Structure Database, Annual Business Survey and Annual Survey of Hours and Earnings.

While broad regional/sectoral trends may not be sufficiently granular metrics to measure the impact of SIPF projects in themselves, this trend data can still be helpful for contextualising primary project level data and other evaluation evidence. We have therefore included some such data within our baselining.

The short list of secondary quantitative data sources identified as being informative for impact evaluation and quantitative baselining is summarised in Table 7 below. The full list of secondary quantitative data sources evaluated and reasons for their inclusion/exclusion is set out in Annex A.[5]

[5] As well as the data sources set out in Annex A, we have also reviewed the BEIS/Nesta Research & Development spatial data tool. We note that the BEIS/NESTA tool is validating of our assessment of secondary data sources, in so much that the tool relies heavily on the data sources we have identified as being most helpful (for example, HESA and BERD data) and the data sources used in the tool are in line with those we have considered as part of our secondary data sources assessment.

TABLE 7 SECONDARY QUANTITATIVE DATA SOURCES

DATA SOURCE	RELEVANT EQS	METRICS	ASSESSMENT
Dimensions.ai	EQ1, Indicator 1, Indicator 3 EQ9, Indicator 1	Publications, citations, Field Citation Ratio (FCR), number of publications with at least one industry co-author, and number of publications cited by at least on policy document. All metrics available by postcode and 'field of research'.	Detailed geographic disaggregation. The classification of subject area is also quite granular. Provides helpful metrics on quantity and quality of research outputs to complement project level ResearchFish submissions.
HESA Finance Data	EQ1, Indicator 2	Income from research grants and contracts by HE provider and HESA cost centre (£ thousands)	HESA cost centre is not an ideal level of disaggregation for identifying projects but provides some broad trends in research grant income for the HE provider partners of each project.
HESA Business and Community Interaction Data (HE-BCI)	EQ2, Indicator 1 EQ3, Indicator 2 EQ9, Indicator 1	Intellectual property spin-off activities by HE provider, including: Estimated current employment of all active firms (FTE); Estimated current turnover of all active firms (£ thousands); Estimated external investment received (£ thousands); Number of newly registered companies within the reporting period; Number of active firms; Number still active which have survived at least 3 years; Number of new patents applications filed in year; Number of patents filed by an external party naming the HEP as an inventor.	Data is not split by subject but provides some broad trends in spin-off and patent activity for the HE provider partners of each project.

DATA SOURCE	RELEVANT EQS	METRICS	ASSESSMENT
Apprenticeships and Traineeships Data - UK Government	EQ6, Indicator 1	Apprenticeship participation by region and sector	Region is disaggregated at LAD level and sectors are SSAT2 groups (or equivalent for Wales, Scotland and Northern Ireland). Provides broad regional and sectoral trends in apprenticeship numbers.
Business Enterprise Research and Development Data (BERD)	EQ2, Indicator 2	Employment in R&D performed in UK businesses by 'detailed product group' – 2019 (thousands); Expenditure on R&D performed in UK businesses by 'detailed product group' – since 2008 (£ millions); Expenditure on R&D performed in UK businesses by SIC code – since 2010 (£ millions).	Not possible to split data reliably by both region and sector simultaneously due to sample size.[6] Provides broad trends for sectoral expenditure and employment in R&D.
Annual Survey of Hours and Earnings (ASHE)	EQ5, Indicator 1	Median weekly gross pay for full time employees (£)	Available by both geography and sector but with somewhat limited granularity due to sample size. Requires secure access permission.
Business Structure Database (BSD)	EQ3, Indicator 2 EQ5, Indicator 1 EQ7, Indicator 2	Employment by SIC code and post code; Turnover by SIC code and post code.	Relatively fine granularity data, however, does not include information required for calculating GVA. Requires secure access permission.

[6] Prior to 2019, BERD data is available split simultaneously at the NUTS1 and 'broad product group' levels, however, broad product groups are substantially too broad for association with individual SIPF projects in most cases. For the purpose of baselining we therefore rely on BERD data split at the 'detail product group' or two digit SIC level, with no simultaneous geographic disaggregation.

DATA SOURCE	RELEVANT EQS	METRICS	ASSESSMENT
Annual Business Survey (ABS)	EQ7, Indicator 1, Indicator 2	Gross Value Added (GVA) by region and SIC code; Employment by region and SIC code; Turnover by region and SIC code;	Provides GVA data. Survey size does not give sufficient granularity to identify projects. May be combined with BSD data to proxy GVA (see below). Requires secure access permission.
Project baselining data	EQ1-EQ12	N/A	We have not yet received project baselining data. We will look to incorporate project baselining (and evaluation) data into the interim and final evaluation reports, where available. We have discussed progress on baselining with all projects. See Section 3.8 for a summary of this discussion.

For estimating Gross Value Added (GVA), our review suggests that the best available approach will be to proxy for GVA by combing BSD and ABS data. Specifically, we propose to use ABS data to calculate GVA to employment and GVA to turnover ratios by sector. Employment and turnover at a finer granularity from the BSD can then be multiplied by these values to proxy for GVA. This approach is in line with the methodology of the Technology Innovation Needs Assessment and Energy Innovation Needs Assessment, and is in line with current BEIS appraisal guidance.[7]

It should be noted that some of the secondary quantitative data sources identified are subject to lags in data availability. This has not significantly impacted baselining, with data up to at least 2019 available in most cases. However, data lags may impact data availability at the interim and final evaluation stages.

In addition to the quantitative data sources described in Table 7, we also draw on geographical contextual information reported in the Levelling Up White Paper. This information does not always correspond perfectly to our chosen baselining years.

[7] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/593463/Refreshed_Nuclear_Fission_TINA_Summary_Report_February2016.pdf and https://www.gov.uk/government/publications/energy-innovation-needs-assessments.

2.2 QUALITATIVE EVIDENCE SOURCES

Many of the metrics identified in the Evaluation Framework rely wholly or partly on qualitative views. In order to provide a baseline position, we undertook an extensive qualitative engagement process for this Baseline Report.

We used three methods for collecting primary qualitative baseline evidence:

1 Semi-structured interviews with SIPF projects;

2 Semi-structured interviews with policy makers and experts; and

3 An email-based consultation process with regional/sectoral experts.

These are summarised individually below.

2.2.1 SEMI-STRUCTURED INTERVIEWS WITH SIPF PROJECTS

In September 2021 and April 2022, the Evaluation Consortium performed hour-long semi-structured interviews with all seven Wave 1 projects and all five Wave 2 projects, respectively. These discussions had the following purposes:

- To understand the baselining activities that are being carried out by individual projects and any available project-level baseline data.
- To gather up-to-date definitions of each project's relevant region, sector and knowledge area, in order to identify the most appropriate secondary data to use in the quantitative baselining.
- To collect suggestions for regional and/or sectoral experts who could be invited to complete the consultation as part of the qualitative baselining.
- To understand the potential for comparison with counterfactual sectors/regions as part of the impact analysis.
- To collect views from the projects themselves on the baseline in areas where qualitative information is needed, including the skills profile, nature of collaboration and reputation in the SIPF-funded sectors/regions.
- To understand the extent to which projects have received past or additional investment, which may impact baseline measurement and the interpretation of the impact evaluation evidence. Information on this topic coming from the interviews was also supplemented by data collected by the SIPF Delivery Team. See Annex B for more details of past investment in SIPF projects.

The full topic guide for the interviews can be found in Annex C.

2.2.2 SEMI-STRUCTURED INTERVIEWS WITH PLACE AND INNOVATION POLICY EXPERTS

During November 2021, the Evaluation Consortium completed five hour-long semi-structured interviews with individuals involved in place and/or innovation policy-making. We identified people to interview through consultation with the SIPF Delivery Team and the Evaluation Working Group (EWG). Interviews took place with individuals from the following organisations:

- UK government: Department for Business, Energy and Industrial Strategy (BEIS); Cabinet Office (Levelling Up Task Force)

- Department for the Economy, Northern Ireland
- Higher Education Funding Council for Wales (HEFCW)
- Welsh government
- Scottish Funding Council
- Scottish government

Depending on availability, some of these discussions were carried out in a group setting, with 2-3 individuals working in similar areas interviewed together.

The interviews focused on the evaluation theme of 'Policy design' (evaluation questions 13 and 14). As such, the main purpose of the interview was to understand the current status of place-based R&I policy-making, including the evidence that is available to draw on, the experts who are consulted and the completeness of the knowledge base.

The topic guide for the interviews can be found in Annex D.

2.2.3 CONSULTATION OF REGIONAL/SECTORAL EXPERTS

We circulated via email a consultation template to 61 individuals. The large majority of these individuals were identified by SIPF-funded projects as sectoral/regional experts who would be well-placed to provide information about the baseline across a number of areas. A smaller number of recipients were Innovate UK Sector Leads, identified by the EWG. After issuing reminders to those who did not reply, we received a total of 34 responses. This included responses from at least one expert across each of the project sectors.

Having assessed the quantitative evidence sources against the ToC, we focused the consultation on the evaluation questions for which we found there was limited quantitative data available, specifically:

- EQ6: Did SIPF increase the **skills** base and/or alter the profile of skills in targeted regions? If not, why not?
- EQ9: Did SIPF enhance and sustain the nature of **collaboration** and the collaboration infrastructure within targeted industries, research fields and regions? If not, why not?
- EQ10: Was the **reputation** for R&I of targeted regions and sectors enhanced as a result of the SIPF funding and outputs? If not, why not?
- EQ11: To what extent (and how) have SIPF projects fostered an **equal, diverse and inclusive** research and business environments, and how well do SIPF projects align with UKRI ED&I aims?

The full consultation template can be found in Annex E.

Although we received a substantial number of responses, it is important to note that **the views of these individuals do not necessarily represent the those of the wider sector or region.**

2.3 SUMMARY OF EVIDENCE USED FOR BASELINING

Table 8 below summarises the evidence source used in baselining for each metric (quantitative evidence, qualitative evidence or both), organised by impact evaluation theme, question and indicator. Note that Table 8 lists the evidence sources relied upon for baselining but does not list all evidence sources that will be relied upon for the evaluation, such as primary project level data and additional qualitative research, as set out in the Evaluation Framework Report.

TABLE 8 SUMMARY OF EVIDENCE USED FOR BASELINING

THEME	EQ		INDICATOR	EVIDENCE SOURCES
1 KNOWLEDGE AND INNOVATION	1	**Did SIPF increase the regional quality and quantity of academic research in key research fields? To what extent was long-term capacity for such research increased? To what extent did this leverage existing local strengths?**	1 Quantity and impact of academic research outputs related to SIPF support (e.g. papers, events, conferences)	Dimensions.ai data
			2 Regional trends in academic R&I spending in targeted fields supported by SIPF	HESA finance data
			3 Additional research funding leveraged for the region as a result of SIPF in targeted fields	Not baselined – indicator to be evaluated from project level primary sources (ResearchFish)
	2	**Did SIPF increase the quantity and quality of regional commercial R&I in key industries? To what extent was long-term capacity for such R&I increased? To what extent did this leverage existing local strengths?**	1 IP - Number of patent, trademark and design applications in targeted regions and sectors	HESA HE-BCI data (patent filings and patent income for HE provider partners of SIPF projects, not available split by sector). Geographical data from the Levelling Up White Paper Evaluation will also draw upon project level primary sources (ResearchFish)
			2 Regional trends in commercial R&I spending in targeted sectors	BERD data (not possible to split by both region and sector simultaneously; baselining focuses on sectoral trends)

			3	Additional business R&D and other innovation-related investments leveraged as follow-on investments as a result of SIPF, including inward investment from outside the region and outside the UK	Baselining consultation Also to be evaluated from project-level primary sources
			4	Private sector R&I jobs created	BERD data provides sectoral trends in R&I employment for baselining. Evaluation will draw upon project-level primary sources
	3	**Have the technologies and new knowledge supported by SIPF progressed innovations and helped create new businesses? If not, why not?**	1	Number of new products and commercial success, as measured by take-up, profitability, expected revenues	Not baselined - indicator to be evaluated from project-level primary sources (ResearchFish)
			2	Spinoff/spinout commercial projects, products and businesses directly related to SIPF funding	HESA HE-BCI data (number and turnover of spinoffs for HE provider partners of SIPF projects, not split by sector). Evaluation will draw upon project-level primary sources
			3	Progress of supported technologies along commercial readiness scales (e.g. TRL/MRL)	Not baselined – to be evaluated qualitatively
	4	**Have the innovations, technologies and new knowledge supported by SIPF been adopted more widely? If so, how are they being used? If not, why not?**	1	Adoption within region/sector targeted by projects	Not baselined – to be evaluated qualitatively
			2	Adoption outside region/sector targeted by projects	Not baselined – to be evaluated qualitatively
2 JOBS AND SKILLS	5	**Did SIPF improve the job prospects, in terms of the number, variety and profile of jobs available within the targeted regions? If not, why not?**	1	Number and profile of jobs supported by SIPF funding	BSD data (employment by SIC code and post code). ASHE data on average wage by region. Geographical data from the Levelling Up White Paper
			2	Profile of follow-on jobs for those supported by SIPF funding	Not baselined - indicator to be evaluated from project-level primary sources (ResearchFish)

	6	**Did SIPF increase the skills base and/or alter the profile of skills in targeted regions? If not, why not?**	1	Volume and quality of skills-focused training, courses and qualifications supported by SIPF	Apprenticeships and Traineeships Data - UK Government (Apprenticeship participation by LAD and subject area) Geographical data from the Levelling Up White Paper
			2	Increased understanding of skills profile and gaps of targeted sectors and regions	Baselining consultation
3 ECONOMIC IMPACT	7	**Did SIPF-funded activities contribute to improved economic performance, particularly within targeted industries and regions? If so, was the improvement sustained? If not, why not?**	1	Impact of SIPF on regional and sectoral GVA	BSD data and ABS data. Geographical data from the Levelling Up White Paper
			2	Impact of SIPF on regional and sectoral productivity	BSD data and ABS data.
			3	Impact of SIPF on regional and sectoral exports	No data available
			4	Sustainability of economic impacts within targeted sectors and regions	Not baselined – to be evaluated qualitatively
	8	**Did SIPF contribute to closing gaps in economic performance across UK regions? If not, why not?**	1	Improvements in economic performance over and above those seen outside of SIPF-supported projects and regions	Not baselined – to be evaluated by BSD data and ABS data
4 NETWORKS AND COLLABORATION	9	**Did SIPF enhance and sustain the nature of collaboration and the collaboration infrastructure within targeted industries, research fields and regions? If not, why not?**	1	New and sustained collaborations between businesses, academics and local decision-makers within SIPF-funded industries and regions	Dimensions.ai data (number of publications with at least one industry co-author). HESA HE-BCI data (number and turnover of spinoffs for HE provider partners of SIPF projects, not split by sector).

			2	Enhanced and more effective collaborations supported by SIPF-enabled investments / improvements in collaboration infrastructure	Baselining consultation Baselining interviews
			3	Has the place-based nature of SIPF affected the nature of collaborations compared with other funding mechanisms that are not explicitly place-based?	Baselining consultation
5 SOCIETAL IMPACT	**10**	**Was the reputation for R&I of targeted regions and sectors enhanced as a result of the SIPF funding and outputs? If not, why not?**	1	Academic standing of universities in the regions and the fields supported by SIPF funding	Dimensions.ai data
			2	National and international reputation of local areas targeted by SIPF as centres of innovation in relevant sectors	Baselining consultation
	11	**To what extent (and how) have SIPF projects fostered an equal, diverse and inclusive research and business environments, and how well do SIPF projects align with UKRI ED&I aims?**	1	ED&I measures for funded projects, project partners and key industries in targeted regions	Baselining consultation
	12	**Did the outputs of SIPF improve the health, wellbeing and environment of individuals in targeted regions?**	1	Examples gathered from within SIPF projects	Geographical data from the Levelling Up White Paper Not baselined in detail – to be evaluated qualitatively
6 POLICY DESIGN	**13**	**To what extent has the evidence base around the impact of locally targeted R&I spending in the UK been improved?**	1	Improved evidence and understanding of the efficacy of place-based R&I funding	Baselining interviews
	14	**Did the learnings from SIPF influence and improve the design of R&I policy?**	1	Evidence on how SIPF and projects have influenced and engaged policymakers (local, regional, national)	Baselining interviews

7 VALUE FOR MONEY	**15**	**To what extent does the SIPF represent value for money given the overall impact on knowledge, economy and society relative to the size of the investment?**	1 Total implementation cost for SIPF	Not baselined
			2 Measurement and valuation of economic and social impacts of SIPF, including qualitative assessment where quantification or valuation is not possible	Combination of above indicators
			3 Assessment of place-based aspects of SIPF value for money	Combination of above indicators

Source: Frontier Economics, RAND and know.consulting

Note: The evidence sources listed are those relied upon for baselining. This does not necessarily include all evidence sources that will be relied upon for the evaluation, such as primary project level data and additional qualitative research, as set out in the Evaluation Framework Report.

2.4 KEY EVIDENCE GAPS

Through our baselining process, we have identified a number of key evidence gaps:

- **Secondary data on regional trade impacts**: there is very limited data available relating to the impact of SIPF on regional and sectoral exports (EQ7 Indicator 3). Some HMRC regional trade in goods statistics are publicly available; however, these are at a very limited level of disaggregation. Additionally, many of the outputs of the projects would relate to service activities, not captured by statistics relating to trade in physical goods. Evaluation of the impact of SIPF projects on regional and sectoral exports will therefore need to rely on qualitative evidence and any data available from project-level evaluations.

- **Secondary data on commercial R&I and patents**: while good data is available from HESA on R&I and patents filled by HE provider partners, this may not capture wider commercial R&I. Available commercial patent datasets have a significant lag (over 5 years) making them impractical for use in the evaluation. Available surveys of commercial R&D activity have limited sample sizes, meaning only broad regional/sectoral trends are available. There is some contextual data reported in the Levelling Up White Paper but this is old (from 2012) and not granular. Evaluation will therefore need to rely on primary evidence and project level KPIs relating to R&I and patents.

- **Secondary data on health, wellbeing and environment of individuals in SIPF supported regions**: we have been unable to identify reliable and sufficiently disaggregated data relating to health, wellbeing and the environment (see Section 3.5). Again, we include some high-level geographical information from the Levelling Up White Paper but the evaluation will need to rely mostly on primary evidence (in particular qualitative assessment) at the Fund-level, as well as evidence gathered through project-level evaluations.

- **Project baselining data**: at the time of collecting evidence for the Baseline Report, most Wave 1 projects were still in the scoping phase of baselining, and Wave 2 projects had not yet started the process (see Section 3.8 for more details). We anticipate that projects will be collecting project-level baselines to inform their own evaluations, which we will draw on in the interim evaluation phase.

3 BASELINE FINDINGS

In this Section, we set out our baseline findings for each evaluation theme and question. The findings are organised by question. We first present quantitative data relating to each EQ, and then summarise qualitative evidence gathered through the consultation process. In addition, Section 3.8 summarises the baseline activities undertaken by individual projects, and Section 3.9 summarises views of the projects on the feasibility of identifying counterfactual regions/sectors.

3.1 KNOWLEDGE AND INNOVATION

3.1.1 EQ1: DID SIPF INCREASE THE REGIONAL QUALITY AND QUANTITY OF ACADEMIC RESEARCH IN KEY RESEARCH FIELDS? TO WHAT EXTENT WAS LONG-TERM CAPACITY FOR SUCH RESEARCH INCREASED? TO WHAT EXTENT DID THIS LEVERAGE EXISTING LOCAL STRENGTHS?

Secondary quantitative data sources used for baselining this EQ:

- Dimensions.ai
- HESA finance data

DIMENSIONS.AI

We have considered citation data on publications (journal articles and conference proceedings) within the SIPF project regions (by postcode) and subject categories.[8] This is shown in Table 9 below. We find that for the years 2015-2019 inclusive, most project regions had publications in relevant subject categories that were highly cited compared to the average (all had average field citation ratios[9] of 1.9 or more). However, there is some variation between projects. In general, variation between projects is to be expected and will partly reflect the publication and citation rates of the subjects covered by each project, as well as the breadth of different subject areas covered by each project. When interpreting any impacts of the individual projects on these metrics, it will be important to consider these differences, looking at proportional impacts relative to the baseline, were appropriate. It may be harder to identify and attribute quantitative impacts in these metrics for projects that cover a broader scope of subject areas as the 'signal-to-noise' ratio may be lower.

[8] The relevant subject categories were identified from the Dimensions.ai 'fields or research' (FoR) based on input from the SIPF projects. FoR is a categorization scheme that is applied to all documents in Dimensions using a machine learning model. A document can be classified into several FoRs. FoRs have a two-digit first-level code (eg. 01 Mathematical Sciences) and a second-level code (eg. 0101 Pure Mathematics). For some biomedical-focussed projects, the Research, Condition, and Disease Categorization (RCDC) scheme developed by NIH has been used to provide more granular categories not available in FoR. Like FoR, RCDC is applied using a machine learning model and a document can have more than one RCDC.

[9] FCR is a field-normalized citation metric. It is calculated on publications that are at least two years old. FCR is aggregated using the geometric mean. For more on FCR, please see https://dimensions.freshdesk.com/support/solutions/articles/23000018848-what-is-the-fcr-how-is-it-calculated-

TABLE 9 PUBLICATIONS WITHIN SIPF PROJECT REGIONS AND SUBJECT CATEGORIES (2015-19)

Project	Articles	Proceedings	Total times cited	Average times cited	Average Field Citation Ratio
Decarbonising Maritime Transportation	510	49	12,961	23.19	2.40
CS Connected	1,917	181	48,467	23.10	2.38
Smart Data Foundry	3,084	2,048	74,033	14.43	2.95
Growing Kent and Medway	780	4	19,400	24.74	3.06
MyWorld	82	3	732	8.61	1.93
The Living Lab	10,830	414	291,395	25.92	3.02
iicon	8,138	222	193,866	23.19	2.93
AMPI	4,450	1,507	102,102	17.14	3.01
Digital Dairy	1,290	929	28,076	12.65	2.48
Midlands Advanced Ceramics	9,993	2,442	233,949	18.81	2.68
SmartNanoNI	856	411	20,801	16.42	2.98
media.cymru	136	0	1,359	9.99	2.04

Source: Dimensions.ai

We have also looked at the number of publications within the SIPF project regions and subject categories that have been cited by at least one policy document. This is shown in Table 10 below. We find that for the years 2015-2019 inclusive, all project regions had publications that had been cited by at least one policy document. However, there is a lot of variation between the regions and subject categories (ranging from 0.2% to 11%).

TABLE 10 PUBLICATIONS CITED BY AT LEAST ONE POLICY DOCUMENT (2015-19)

Project	Articles	Proceedings	Publications cited by policy documents	Publications cited by policy documents (%)
Decarbonising Maritime Transportation	510	49	1	0.18
CS Connected	1,917	181	12	0.57
Smart Data Foundry	3,084	2,048	53	1.03
Growing Kent and Medway	780	4	89	11.35
MyWorld	82	3	2	2.35

The Living Lab	10,830	414	679	6.04
iicon	8,138	222	798	9.55
AMPI	4,450	1,507	68	1.14
Digital Dairy	1,290	929	9	0.41
Midlands Advanced Ceramics	9,993	2,442	55	0.44
SmartNanoNI	856	411	6	0.47
media.cymru	136	0	9	6.62

Source: Dimensions.ai

HESA FINANCE DATA

We have also considered data on research grant and contract income for the HE provider partners of each SIPF project within the broad subject areas to which the projects relate. This is shown in Table 11 below. We find that for the 2019/20 academic year, the HE provider partners of most projects had around £10m to £30m in research grant and contract income relating to the project subject area, with (in most cases) the majority of this income coming from sources other than research councils. However, there is considerable variation between projects, with the University of Glasgow receiving over £100m in research grants and contracts within subjects related to Medicine and Pharmacology. The interim and final impact evaluations will need to take into account these differences in the initial baseline quantity of academic research grants and contracts. As mentioned above, variation between projects is to be expected and will partly reflect the breadth of different subject areas covered by each project and it may be harder to identify and attribute quantitative impacts in these metrics for projects that cover a broader scope of subject areas as the 'signal-to-noise' ratio may be lower.

TABLE 11 INCOME OF HE PROVIDER PARTNERS FROM RESEARCH GRANTS AND CONTRACTS (£ THOUSANDS)

Project	HE Provider Partners	HESA cost centres	Source	2019/2020
Decarbonising Maritime Transportation	Queens University, Ulster University, Belfast MET	120 Mechanical, aero & production engineering;117 Mineral, metallurgy & materials engineering;121 IT, systems sciences & computer software engineering	Research councils Other **Total**	2,824 9,993 **12,817**
CS Connected	Cardiff University, Swansea University	119 Electrical, electronic & computer engineering;116 Chemical engineering;117 Mineral, metallurgy & materials engineering	Research councils Other **Total**	2,972 4,895 **7,867**
Smart Data Foundry	University of Edinburgh	129 Economics & econometrics;133 Business & management studies;121 IT, systems sciences & computer software	Research councils Other **Total**	8,294 32,142 **40,436**

		engineering;122 Mathematics		
Growing Kent and Medway	University of Kent, University of Greenwich	110 Agriculture, forestry & food science;112 Biosciences	Research councils Other **Total**	5,100 6,298 **11,398**
iicon	University of Liverpool , Liverpool School of Tropical Medicine	107 Pharmacy & pharmacology;105 Health & community studies;112 Biosciences;106 Anatomy & physiology	Research councils Other **Total**	7,625 13,617 **21,242**
MyWorld	University of Bristol, University of the West of England, University of Bath, Bath Spa University	145 Media studies;119 Electrical, electronic & computer engineering;121 IT, systems sciences & computer software engineering	Research councils Other **Total**	14,141 10,793 **24,934**
The Living Lab	University of Glasgow	101 Clinical medicine;105 Health & community studies;107 Pharmacy & pharmacology;106 Anatomy & physiology;112 Biosciences	Research councils Other **Total**	29,631 75,252 **104,883**
AMPI	University of Huddersfield, University of Leeds, University of Manchester, University of Salford	117 Mineral, metallurgy & materials engineering; 119 Electrical, electronic & computer engineering; 120 Mechanical, aero & production engineering	Research Councils Other **Total**	48,596 23,527 **72,123**
Digital Dairy	SRUC, The University of Strathclyde, The University of the West of Scotland	110 Agriculture, forestry & food science; 120 Mechanical, aero & production engineering; 121 IT, systems sciences & computer software engineering	Research Councils Other **Total**	4,654 44,214 **48,868**
media.cymru	Cardiff Metropolitan University, Cardiff University, University of South Wales	145 Media studies;119 Electrical, electronic & computer engineering;121 IT, systems sciences & computer software engineering	Research Councils Other **Total**	5,385 9,172 **14,557**
Midlands Advanced Ceramics	The University of Birmingham, The University of Leicester, Loughborough University	117 Mineral, metallurgy & materials engineering; 120 Mechanical, aero & production engineering	Research Councils Other **Total**	9,385 21,355 **30,740**
SmartNanoNI	Queen's University Belfast, Ulster University	119 Electrical, electronic & computer engineering; 117 Mineral, metallurgy & materials engineering	Research Councils Other **Total**	5,469 8,317 **13,786**

Source: HESA / OfS

Note: No data available for Belfast MET. Figures represent the total for all HE provider partners of each project.

3.1.2 EQ2: DID SIPF INCREASE THE QUANTITY AND QUALITY OF REGIONAL COMMERCIAL R&I IN KEY INDUSTRIES? TO WHAT EXTENT WAS LONG-TERM CAPACITY FOR SUCH R&I INCREASED? TO WHAT EXTENT DID THIS LEVERAGE EXISTING LOCAL STRENGTHS?

Secondary quantitative data sources used for baselining this EQ:

- HESA HE-BCI data on patent filings
- Geographical data from the Levelling Up White Paper[10]
- BERD data on R&D expenditure and employment

HESA HE-BCI PATENT DATA

The quality of secondary quantitative data available on commercial R&I is somewhat limited. Table 12 below shows patent filings and patent income for the HE provider partners of each SIPF project. This data is **not split by subject** and so it is not clear if these patents relate to subject areas covered by the SIPF projects. Given these metrics are not split by subject, where projects have the same academic partners, there is some overlap. For the purpose of the interim and final impact evaluations, it will be important to note this and not 'double count' any impacts on these metrics by attributing them to multiple projects. It should also be noted that many of the projects are business led and it should not be expected that all patents and IP will be generated by the HE provider partners.

We anticipate that primary project level ResearchFish submissions will provide more accurate data on patents generated through the project activities and this data will only be used contextually. In particular, this data gives a broad sense of the number of patents filed and annual patent income for HE provider partners. HE provider partners for each project filed or were named as an inventor on around 100 patents in the academic year 2019/20. However, there are substantial differences in annual patent income of HE provider partners between projects.

10 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1052708/Levelling_up_the_UK_white_paper.pdf

TABLE 12 PATENT FILINGS AND PATENT INCOME OF HE PROVIDER PARTNERS

Project	HE Provider Partners	Metric	2019/20
Decarbonising Maritime Transportation	Queens University, Ulster University, Belfast MET*	Cumulative patent portfolio	911
		Number of new patents applications filed in year	83
		No. of patents filed by external parties naming HEP as an inventor	2
		Patent Income (£ thousands)	413
CS Connected	Cardiff University, Swansea University	Cumulative patent portfolio	417
		Number of new patents applications filed in year	76
		No. of patents filed by external parties naming HEP as an inventor	89
		Patent Income (£ thousands)	2,743
Smart Data Foundry	University of Edinburgh	Cumulative patent portfolio	631
		Number of new patents applications filed in year	106
		No. of patents filed by external parties naming HEP as an inventor	1
		Patent Income (£ thousands)	1,147
Growing Kent and Medway	University of Kent, University of Greenwich	Cumulative patent portfolio	219
		Number of new patents applications filed in year	15
		No. of patents filed by external parties naming HEP as an inventor	100
		Patent Income (£ thousands)	265
iicon	University of Liverpool , Liverpool School of Tropical Medicine	Cumulative patent portfolio	375
		Number of new patents applications filed in year	24
		No. of patents filed by external parties naming HEP as an inventor	43
		Patent Income (£ thousands)	2,688
MyWorld	University of Bristol, University of the West of England, University of Bath, Bath Spa University	Cumulative patent portfolio	354
		Number of new patents applications filed in year	93
		No. of patents filed by external parties naming HEP as an inventor	23
		Patent Income (£ thousands)	1,199
The Living Lab	University of Glasgow	Cumulative patent portfolio	224
		Number of new patents applications filed in year	83
		No. of patents filed by external parties naming HEP as an inventor	100
		Patent Income (£ thousands)	1,799
AMPI	The University of Huddersfield, The University of Leeds, The University of Manchester, The University of Salford	Cumulative patent portfolio	1,169
		Number of new patents applications filed in year	139
		No. of patents filed by external parties naming HEP as an inventor	97
		Patent Income (£ thousands)	2,289
Digital Dairy	SRUC, The University of Strathclyde, The University of the West of Scotland	Cumulative patent portfolio	412
		Number of new patents applications filed in year	22
		No. of patents filed by external parties naming HEP as an inventor	-
		Patent Income (£ thousands)	571
media.cymru	Cardiff Metropolitan University, Cardiff University,	Cumulative patent portfolio	395
		Number of new patents applications filed in year	65
		No. of patents filed by external parties naming HEP as an inventor	95

	University of South Wales	Patent Income (£ thousands)	2,257
Midlands Advanced Ceramics	The University of Birmingham, The University of Leicester, Loughborough University	Cumulative patent portfolio	1,716
		Number of new patents applications filed in year	117
		No. of patents filed by external parties naming HEP as an inventor	847
		Patent Income (£ thousands)	1,652
SmartNanoNI	North West Regional College, Queen's University Belfast, Ulster University	Cumulative patent portfolio	911
		Number of new patents applications filed in year	83
		No. of patents filed by external parties naming HEP as an inventor	2
		Patent Income (£ thousands)	413

Source: HESA

Note: No data available for Belfast MET. Figures represent the total for all HE provider partners of each project.

GEOGRAPHICAL DATA FROM THE LEVELLING UP WHITE PAPER

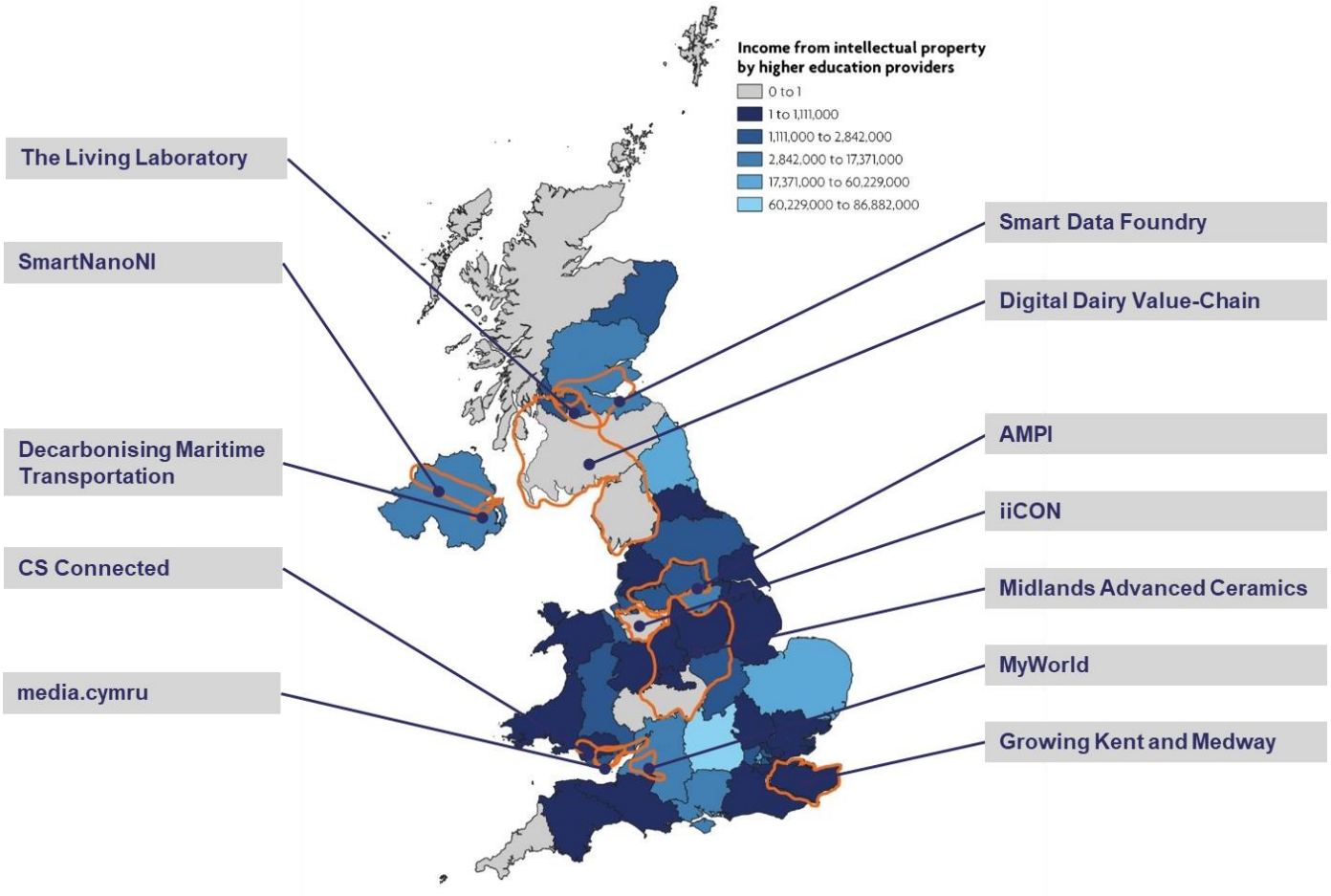
To put the information above in the context of the national picture, Figure 4**Error! Reference source not found.** shows the geographies of the SIPF projects, compared with HESA data on income from IP by HE providers by UK ITL2 subregions in 2018 (as reported in the Levelling Up White Paper).

The data suggest that:

- **Northern Ireland (Decarbonising Maritime Transportation and SmartNanoNI).** Northern Ireland, as a whole, has HE IP income falling within the third highest of the six bins/buckets defined from the distribution.
- **South Wales (CS Connected and media.cymru).** South Wales has relatively low HE IP income, with all areas falling within the third or second lowest bins/buckets.
- **Scotland/Cumbria (Digital Dairy, The Living Laboratory and Smart Data Foundry.** The regions in which SIPF-funded projects are based in Scotland/Cumbria are mixed in terms of HE IP income. The large south-eastern area surrounding Edinburgh (where the lead partner for Smart Data Foundry, University of Edinburgh, is based) has middle-to-high HE IP income. Glasgow, which is included in the geographies for The Living Laboratory and Digital Dairy has lower HE IP income. South West Scotland and Cumbria (the bulk of the territory covered by Digital Dairy) appears to have no HE IP income at all in 2018.
- **North West England/Yorkshire and the Humber (AMPI and iicon).** The areas covered by AMPI and iicon are mixed in terms of HE IP income. Much of the region has very low HE IP income, although South Yorkshire (partly covered by AMPI) has HE IP in the third highest bin/bucket.
- **Midlands (Midlands Advanced Ceramics).** Midlands Advanced Ceramics covers a large geographical area, the majority of which appears to have relatively low HE IP income, and Herefordshire, Worcestershire and Warwickshire appears to have no HE IP income at all.
- **South West England (MyWorld).** The geography covered by MyWorld has relatively high HE IP income: most of the area falls within the third highest bin/bucket of the distribution.

- **South East England (Growing Kent and Medway).** The geography covered by Growing Kent and Medway has very low income from HE IP, with the whole area falling within the second lowest bin/bucket.

FIGURE 4 SIPF PROJECTS COMPARED WITH INCOME FROM INTELLECTUAL PROPERTY BY HE PROVIDERS (2018)



Source: BEIS (HE intellectual property income: Income from intellectual property by higher education providers, 2018)

In addition to the data on income from IP by HE providers, discussed above, the Levelling Up White Paper reports information on total patent applications to the European Patent Office (EPO) by ITL2 subregion (see Figure 5). It should be noted that this data is out-of-date – the latest year available is 2012. Nevertheless, it can demonstrate broad geographical patterns in innovation.

The data suggests that:

- **Northern Ireland (Decarbonising Maritime Transportation and SmartNanoNI).** Northern Ireland, as a whole, has patent applications falling within the second lowest bin/bucket defined from the distribution.

- **South Wales (CS Connected and media.cymru).** South Wales also has a relatively low number of patent applications, with all areas falling within the lowest or second lowest bins/buckets.

- **Scotland/Cumbria (Digital Dairy, The Living Laboratory and Smart Data Foundry.** The regions in which SIPF-funded projects are based in Scotland/Cumbria also have a low number of patent applications, with the west of Scotland (Digital Dairy and the Living Laboratory) reporting fewer than the east (Smart Data Foundry).

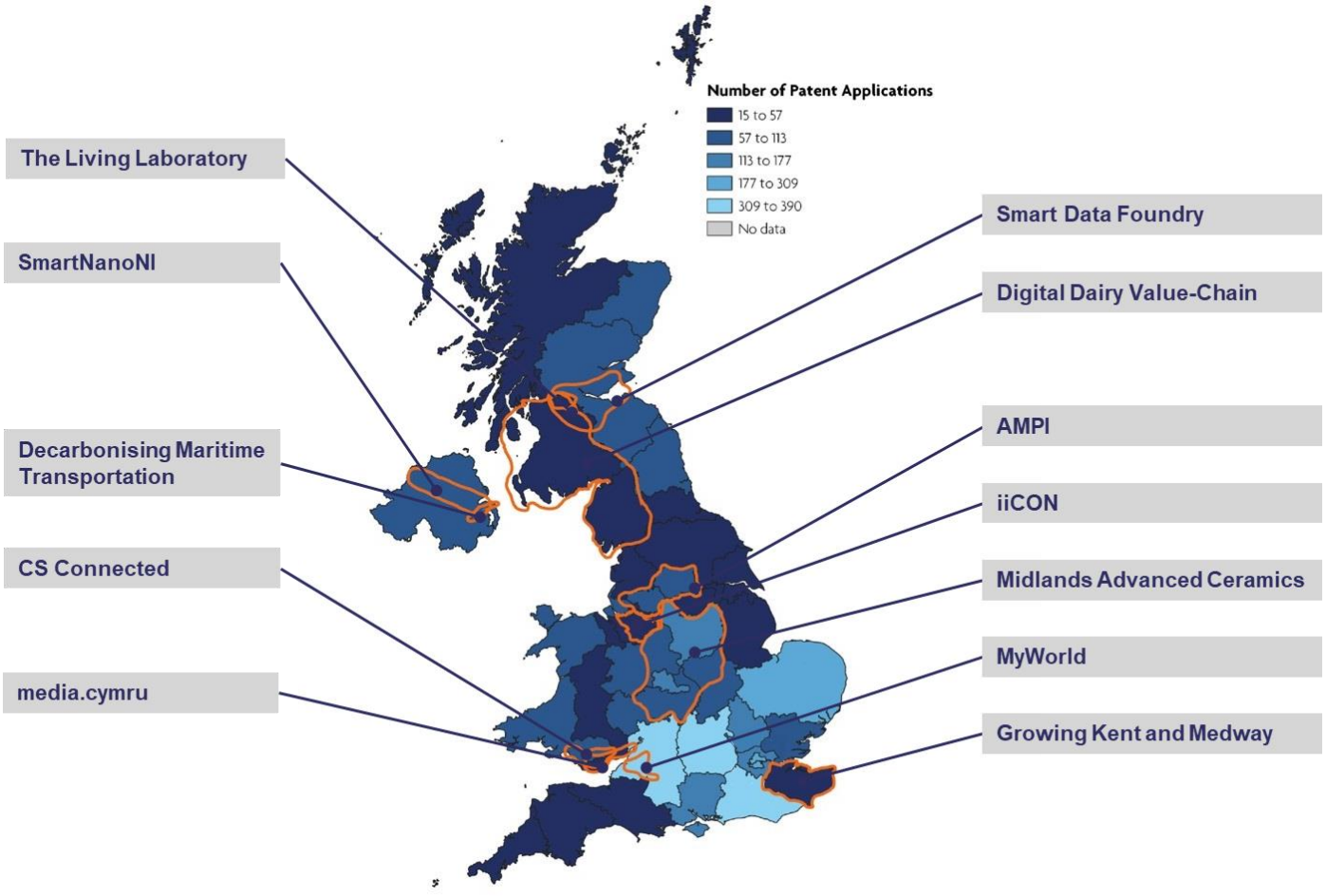
- **North West England/Yorkshire and the Humber (AMPI and iicon).** The areas covered by AMPI and iicon also report a low number of patent applications (within the lowest and second lowest bins/buckets).

- **Midlands (Midlands Advanced Ceramics).** Midlands Advanced Ceramics covers a large geographical area, which generally report a relatively low number of patent applications. Patent applications are higher in the Nottingham and Birmingham regions than the rest of the area.

- **South West England (MyWorld).** The geography covered by MyWorld reports a high number of patent applications (highest bin/bucket).

- **South East England (Growing Kent and Medway).** The geography covered by Growing Kent and Medway has a low number of patent applications, falling within the lowest bin/bucket.

FIGURE 5 SIPF PROJECTS COMPARED WITH EPO PATENT APPLICATIONS (2012)



Source: BEIS (Patent applications (EPO): Count of patent applications normalised by the number of applicants in a patent if there are more than one, 2012)

BERD DATA

Table 13 and Table 14 below show R&D expenditure and employment within the UK for 'detailed product groups' or (two digit) SIC codes related to the SIPF projects. The sectoral granularity of this data is coarse: the 'detailed' product groups are, in practice, relatively broad and no simultaneous regional splits are available.[11] As a result, this data provides some useful sectoral context but does not map directly to the SIPF projects for the purpose of impact evaluation.[12] Additionally, where projects overlap in terms of broad product groups or (two digit) SIC codes, there is some overlap in these metrics because the data is not split by region.

The data suggests that there is substantial variation in R&D activity between the different sectors of the SIPF projects, with R&D activity in shipbuilding and agriculture being substantially lower than within finance and pharmaceuticals. Over the last five years, R&D expenditure has been growing in all of these sectors but the rate of growth has varied between sectors. Among these sectors, the fastest growth of R&D expenditure has occurred in 'other non-metallic mineral products' and 'financial and insurance activities' and the slowest growth has occurred in 'agriculture, hunting, forestry and fishing'. It will be important to consider these existing trends (as well as existing trends in other metrics) within the impact evaluation.

[11] Prior to 2019, BERD data is available split simultaneously at the NUTS1 and 'broad product group' levels, however, broad product groups are substantially too broad for association with individual SIPF projects in most cases. For the purpose of baselining we therefore rely on BERD data split at the 'detail product group' or two digit SIC level, with no simultaneous geographic disaggregation.

[12] Data on commercial R&D expenditure and employment is also available from the UK Innovation Survey (UKIS). This data is available via the ONS secure research service. While the UKIS has a larger sample size than the BERD survey, it is still not of a sufficient sample size to reliably disaggregate the data by both industry and region simultaneously to a level that allows mapping directly to SIPF projects.

TABLE 13 UK R&D EXPENDITURE (£ MILLIONS) BY PRODUCT GROUP OR SIC CODES

Project	Related product group or SIC codes	2015	2016	2017	2018	2019
Decarbonising Maritime Transportation	Shipbuilding	300	310	343	362	388
CS Connected	Manufacture of computer, electronic and optical products; and Manufacture of electrical equipment	1,198	1,261	1,224	1,369	1,453
Smart Data Foundry	Financial and insurance activities	435	401	581	709	690
Growing Kent and Medway	Agriculture, hunting and forestry; Fishing	139	132	144	140	144
iicon	Pharmaceuticals	4,165	4,090	4,320	4,466	4,772
MyWorld	Motion picture, video and television programme production, sound recording and music publishing activities; and Arts, entertainment and recreation	260	326	401	351	384
The Living Lab	Pharmaceuticals	4,165	4,090	4,320	4,466	4,772
AMPI	Machinery and equipment	966	921	1,037	1,040	1,136
Digital Dairy	Manufacture of food products	242	266	286	261	300
media.cymru	Motion picture, video and television programme production, sound recording and music publishing activities; and Arts, entertainment and recreation	260	326	401	351	384
Midlands Advanced Ceramics	Other non-metallic mineral products	54	64	85	102	103
SmartNanoNI	Manufacture of computer, electronic and optical products; and Manufacture of electrical equipment	1,198	1,261	1,224	1,369	1,453

Source: ONS – BERD survey

Note: Shipbuilding; Agriculture, hunting, forestry and fishing; Machinery and equipment; Other non-metallic mineral products; and Pharmaceuticals are detailed product groups reported in the BERD survey. Manufacture of computer, electronic and optical products; Manufacture of food products; Manufacture of electrical equipment; Financial and insurance activities; Motion picture, video and television programme production, sound recording and music publishing activities; and Arts, entertainment and recreation are two digit Standard Industry Classification 07 codes.

TABLE 14 UK R&D EMPLOYMENT (THOUSANDS) BY PRODUCT GROUP (2019)

Project	Related product group	R&D Employment	Scientists and Engineers	Technicians laboratory assistants and draughtsmen	Administrative clerical and others
Decarbonising Maritime Transportation	Shipbuilding	4	-	-	-
CS Connected	Electrical equipment	8	6	1	1
Smart Data Foundry	Miscellaneous business activities; Technical testing and analysis	27	11	14	3
Growing Kent and Medway	Agriculture, hunting and forestry; Fishing	1	-	-	-
iicon	Pharmaceuticals	29	12	8	10
MyWorld	*No relevant product group available*	No data	No data	No data	No data
The Living Lab	Pharmaceuticals	29	12	8	10
AMPI	Machinery and equipment	12	5	4	3
Digital Dairy	Food products and beverages (including tobacco products)	5	-	-	2
media.cymru	*No relevant product group available*	No data	No data	No data	No data
Midlands Advanced Ceramics	Other non-metallic mineral products	2	1	1	-
SmartNanoNI	Computers and peripheral equipment	3	3	-	-

Source: ONS – BERD survey

Note: "-" denotes nil, figures unavailable or too small to display. No relevant detailed product group within the BERD survey could be assigned to MyWorld or media.cymru.

3.1.3 EQ3: HAVE THE TECHNOLOGIES AND NEW KNOWLEDGE SUPPORTED BY SIPF PROGRESSED INNOVATIONS AND HELPED CREATE NEW BUSINESSES? IF NOT, WHY NOT?

Secondary quantitative data sources used for baselining this EQ:

- HESA HE-BCI data on spin-off activities

HESA HE-BCI SPIN-OFF ACTIVITIES DATA

One source of data relating to this evaluation question is HESA data on spin-off activities by HE providers. Table 15 below shows a number of metrics relating to spin-off activities by the HE provider partners of SIPF projects, including estimated employment, turnover, and number of new firms related to spin-off activities. However, it is important to note that this data is not split by subject area and, therefore, it is uncertain the extent to which these spin-off activities relate to the subject areas of the SIPF projects.[13] In practice, this means that this data cannot reliably be used in isolation for identifying quantitative impacts of individual projects. Rather, the potential use of the data is in providing context as to the baseline levels

[13] Given these metrics are not split by subject, where projects have the same academic partners, there is some overlap.

of spin off activities by the HE provider partners of SIPF projects, against which to compare primary project data on project outcomes and any qualitative evidence gathered through project- or Fund-level evaluations, to help draw conclusions about impact.

TABLE 15 INTELLECTUAL PROPERTY: SPIN-OFF ACTIVITIES OF HE PROVIDER PARTNERS

Project	HE Provider Partners	Metric	2019/2020
Decarbonising Maritime Transportation	Queens University, Ulster University, Belfast MET*	Estimated current employment of all active firms (FTE)	2,961
		Estimated current turnover of all active firms (£ thousands)	343,612
		Estimated external investment received (£ thousands)	115,379
		Number of newly registered companies within the reporting period	55
		Number of active firms	125
		Number still active which have survived at least 3 years	83
CS Connected	Cardiff University, Swansea University	Estimated current employment of all active firms (FTE)	1,462
		Estimated current turnover of all active firms (£ thousands)	82,450
		Estimated external investment received (£ thousands)	15,542
		Number of newly registered companies within the reporting period	112
		Number of active firms	436
		Number still active which have survived at least 3 years	226
Smart Data Foundry	University of Edinburgh	Estimated current employment of all active firms (FTE)	1,650
		Estimated current turnover of all active firms (£ thousands)	196,247
		Estimated external investment received (£ thousands)	25,825
		Number of newly registered companies within the reporting period	98
		Number of active firms	465
		Number still active which have survived at least 3 years	290
Growing Kent and Medway	University of Kent, University of Greenwich	Estimated current employment of all active firms (FTE)	172
		Estimated current turnover of all active firms (£ thousands)	6,150
		Estimated external investment received (£ thousands)	-
		Number of newly registered companies within the reporting period	25
		Number of active firms	113
		Number still active which have survived at least 3 years	63
iicon	University of Liverpool , Liverpool School of Tropical Medicine	Estimated current employment of all active firms (FTE)	131
		Estimated current turnover of all active firms (£ thousands)	45,856
		Estimated external investment received (£ thousands)	950
		Number of newly registered companies within the reporting period	8
		Number of active firms	82
		Number still active which have survived at least 3 years	70
MyWorld	University of Bristol, University of the West of England, University of Bath, Bath Spa University	Estimated current employment of all active firms (FTE)	2,364
		Estimated current turnover of all active firms (£ thousands)	237,005
		Estimated external investment received (£ thousands)	512,226
		Number of newly registered companies within the reporting period	38
		Number of active firms	387
		Number still active which have survived at least 3 years	210
The Living Lab		Estimated current employment of all active firms (FTE)	262

	University of Glasgow	Estimated current turnover of all active firms (£ thousands)	-
		Estimated external investment received (£ thousands)	-
		Number of newly registered companies within the reporting period	24
		Number of active firms	130
		Number still active which have survived at least 3 years	63
AMPI	University of Huddersfield, University of Leeds, University of Manchester, University of Salford	Estimated current employment of all active firms (FTE)	4,074
		Estimated current turnover of all active firms (£ thousands)	173,598
		Estimated external investment received (£ thousands)	140,730
		Number (of newly registered companies within the reporting period)	176
		Number of active firms	924
		Number still active which have survived at least 3 years	502
Digital Dairy	SRUC, The University of Strathclyde, The University of the West of Scotland	Estimated current employment of all active firms (FTE)	1,796
		Estimated current turnover of all active firms (£ thousands)	224,333
		Estimated external investment received (£ thousands)	21,535
		Number (of newly registered companies within the reporting period)	22
		Number of active firms	194
		Number still active which have survived at least 3 years	128
media.cymru	Cardiff Metropolitan University, Cardiff University, University of South Wales	Estimated current employment of all active firms (FTE)	1,494
		Estimated current turnover of all active firms (£ thousands)	46,937
		Estimated external investment received (£ thousands)	16,451
		Number (of newly registered companies within the reporting period)	185
		Number of active firms	793
		Number still active which have survived at least 3 years	412
Midlands Advanced Ceramics	The University of Birmingham, The University of Leicester, Loughborough University	Estimated current employment of all active firms (FTE)	1,519
		Estimated current turnover of all active firms (£ thousands)	42,317
		Estimated external investment received (£ thousands)	47,754
		Number (of newly registered companies within the reporting period)	98
		Number of active firms	428
		Number still active which have survived at least 3 years	216
SmartNanoNI	Queen's University Belfast, Ulster University	Estimated current employment of all active firms (FTE)	2,961
		Estimated current turnover of all active firms (£ thousands)	343,612
		Estimated external investment received (£ thousands)	115,379
		Number (of newly registered companies within the reporting period)	55
		Number of active firms	125
		Number still active which have survived at least 3 years	83

Source: HESA

Note: No data available for Belfast MET. Figures represent the total for all HE provider partners of each project.

EQ3: QUALITATIVE FINDINGS

The responses to our baselining consultation provided expert views on the **quality of industry-led, commercial R&I/R&D** in the various sectors with SIPF-funded projects. The nature of the material is very sector-specific and we did not receive responses for all sectors. We also received very limited information relating to specific regions, and most of the evidence takes a national perspective.

Starting with the **agriculture** sector (Growing Kent and Medway/Digital Dairy), a respondent from a further- and higher-education college specialising in land-based subjects stated that the quality of industry-led research is inconsistent, and that many rural businesses are dissuaded from engaging in research-led activities because of their small size and limited capacity. This message was echoed by a farmers' union respondent who described business innovation activity as 'limited'. Referring to the areas relevant to the Digital Dairy project specifically, the respondent explained that business spend on R&D is among the lowest in Scotland, and that Cumbria LEP's Local Industrial Strategy[14] highlights an 'innovation gap' and a weak innovation ecosystem. Speaking about the same region, a CEO of an agri-tech centre said that innovation was generally limited to activities around primary production (dairy farming) and although new dairy products emerged, these innovations often originated outside of the region. However, an IUK Sector Lead stated that the quality of commercial R&I in the UK overall is 'extremely high' in agriculture, explaining that the standards of industry-led applications to relevant research calls are generally above the quality threshold for funding.

Regarding **financial services** (Smart Data Foundry), an IUK Sector Lead stated: '[in 2019], very large multi-national organisations did undertake substantial R&D activities. However, the sector, as a whole, was not considered a high R&D investing sector and, in particular, mid-tier and lower organisations typically did not undertake R&D'. A senior member of a financial technology association noted that R&D capability in the Open Finance domain is impeded by a lack of access to high quality training data to enable new and smaller businesses to test and develop algorithmically driven business service.

A respondent from the Innovation Agency with expertise in **health and life sciences** (iicon/Living Lab) stated that, in this sector, 'most of the industry-led R&D was in-house and not through external collaborations'. They also explained that there is 'work to be done to connect industry and academia'. Referring to the Liverpool City Region (LCR) specifically (iicon), an LCR respondent described the quality of industry-led R&D as 'patchy, relatively small-scall and underperforming'. A respondent in the field of **precision medicine** (Living Lab) stated that there was 'some very good quality industry-led R&I across the UK, focussed on the early stages of commercialisation … [There was] less focus on business growth and the scale-up of innovative products and services. An evolving regulatory landscape for medical devices with the EU/UK has been a challenge for commercialisation of R&I'.

For the **creative industries** (MyWorld/media.cymru), an IUK Sector Lead described screen industries, games, fashion and performing arts as 'strong R&D sectors', and said that improvements were needed in advertising and marketing, and in publishing. They suggested that the quality of industry-led R&D in the creative industries was strong but that it tended to be iterative rather than transformative, and there were issues of projects duplicating one another. Referring specifically to Wales (media.cyrmu), an Innovation Consultant suggested that there remains a basic issue of explaining what R&D/I means in the media

[14] https://www.thecumbrialep.co.uk/resources/uploads/files/Local-Industrial-Strategy.pdf

industry. In particular, understanding of the different types of IP, and how to generate and protect it, was relatively poor in the baseline period. They explained that there tends to be an element of secrecy around many media projects (particularly storytelling), which often makes collaboration and open innovation practices challenging.

Regarding **ceramics manufacturing** (Midlands Advanced Ceramics), experts gave mixed views on the quality of industry-led R&D/I. An academic respondent with expertise in advanced manufacturing said that there were some significant leaders in R&D in ceramic manufacturing but that many large companies had very limited involvement in research.

For manufacturing of **advanced machinery** (AMPI), an individual from a manufacturing trade association described commercial R&D/I as being limited to original equipment manufacturers (OEMs) or prime manufacturers, which are often large companies, and stressed that it is often difficult for SMEs to participate. The respondent also highlighted an issue of innovations developed in the UK being sold to foreign companies. There is a perceived lack of a clear pathway in the UK for helping to scale up novel companies.

For the **photonics** industry (SmartNanoNI), a respondent from a photonics industry body with particular expertise in Northern Ireland (NI) said that NI hosts a number of world leaders in imaging, optical test and measurement, and data storage. That these players have global reputations is testimony to the quality of specific industry-led innovation, albeit in very specific niches in the region. However, the participant also stated that participation of NI companies in collaborative R&D projects (e.g. those supported by IUK) with companies based in the wider UK had not been significant.

Finally, for **maritime** (Decarbonising Maritime Transportation), we were told by an IUK Sector Lead that the quality of industry-led, commercial R&I was low, due to a lack of a clear national funding programme (as is available for other forms of transport). They stated that there was R&D taking place between industry partners and in universities, but it was 'fragmented and small in scale', and that this needed to be radically increased if the sector were to help support wider Net Zero goals. However, a respondent from Invest NI noted that commercial R&D in Northern Ireland was stronger in the areas of composite materials and aerospace, which have technological overlaps with the maritime sector.

3.1.4 EQ4: HAVE THE INNOVATIONS, TECHNOLOGIES AND NEW KNOWLEDGE SUPPORTED BY SIPF BEEN ADOPTED MORE WIDELY? IF SO, HOW ARE THEY BEING USED? IF NOT, WHY NOT?

This evaluation question has not been baselined given that the innovations, technologies and new knowledge supported by SIPF are yet to be realised. We anticipate evidence for this EQ coming from ResearchFish returns by projects and qualitative evaluation.

3.2 JOBS AND SKILLS

3.2.1 EQ5: DID SIPF IMPROVE THE JOB PROSPECTS, IN TERMS OF THE NUMBER, VARIETY AND PROFILE OF JOBS AVAILABLE WITHIN THE TARGETED REGIONS? IF NOT, WHY NOT?

Secondary quantitative data sources used for baselining this EQ:

- BSD data on employment
- ASHE data on average pay

BSD EMPLOYMENT DATA

Table 16 below shows total employment by project 'sector-region'. The sectors covered by each project are classified based on SIC five digit codes. The regions covered by each project are classified by partial (three digit) postcode areas. Employment varies considerably between project sector-regions, partly reflecting differences in the baseline level of activity in the targeted sector-regions and partly reflecting differences in the geographic and sectoral scope of the projects. For example, Smart Data Foundry covers the majority of financial and insurance activities in and around Edinburgh. This is a large industry associated with over 200,000 jobs. Midlands Advanced Ceramics covers engineering research, testing and consulting activities across a very large geographic area in the midlands (the largest project region). Other projects cover smaller regions or have sectors defined more specifically within the SIC system, for example, Decarbonising Maritime Transportation, media.cymru, and The Living Lab.

For most project sector-regions, employment has been relatively stable over the baseline period 2015-2019, with a slight upward trend. One exception to this is iicon, for which employment increased substantially, in particular between 2016 and 2017. Our understanding is that this was due to a large new AstraZeneca site built in Macclesfield around this time. Another exception is the Smart Data Foundry sector-region, where employment was declining somewhat.

It should be noted that, even with the relatively fine granularity of disaggregation allowed by the BSD data, it is unlikely that we will be able to observe impacts of the individual projects in this data. This is especially true for projects in large sector-regions. However, this data provides sector-regional trends to contextualise project-level primary outcomes.

TABLE 16 EMPLOYMENT BY PROJECT SECTOR-REGION

PROJECT	EMPLOYMENT				
	2015	2016	2017	2018	2019
Decarbonising Maritime Transportation	5,758	6,226	8,711	8,888	7,798
CS Connected	9,603	4,718	4,931	6,233	6,366
Smart Data Foundry	257,830	230,958	233,360	218,245	213,255
Growing Kent and Medway	20,087	19,956	20,575	31,905	33,307
iicon	2,175	2,096	8,244	8,870	9,274
MyWorld	22,430	23,542	25,956	26,248	26,924
The Living Lab	1,746	1,707	1,745	1,888	1,964
AMPI	46,899	44,899	46,631	51,861	52,496
Digital Dairy	2,423	2,644	2,444	2,493	2,447
media.cymru	1,787	1,628	1,828	2,259	1,988
Midlands Advanced Ceramics	62,391	67,081	68,958	69,365	67,626
SmartNanoNI	10,689	12,215	13,607	14,492	14,599

Source: ONS (BSD)

Note: Table shows total employment by project 'sector-region'. Sector-region is identified by the SIC07 five digit codes and partial postcode areas covered by each project.

ASHE AVERAGE PAY DATA

Table 17 below shows median gross weekly pay for the sector-regions covered by the SIPF projects. Sector is identified at the two digit SIC code level and region at the NUTS3 level. One exception to this is for the two projects in Northern Ireland: given Northern Ireland is not covered by the available ONS data, Table 17

reports gross weekly pay by project sector only, not region. This likely has the effect of increasing the reported gross weekly pay.

Most of the project sector-regions have a baseline level of pay above the UK average, with a slight upward trend. The lowest level identified was for Digital Dairy, with a median sector-region pay of £479 per week in 2019.

While it is unlikely that SIPF projects will substantially impact average wages at this level of granularity, this data provides a helpful benchmark against which to compare primary data and evidence relating to the wage profile of jobs created by SIPF projects.

TABLE 17 AVERAGE GROSS WEEKLY PAY FOR SECTOR-REGIONS OF SIPF PROJECTS

PROJECT	MEDIAN GROSS WEEKLY PAY (£)				
	2015	2016	2017	2018	2019
Decarbonising Maritime Transportation*	637	644	665	671	707
CS Connected	554	589	568	600	574
Smart Data Foundry	..	..	639	661	697
Growing Kent and Medway	535	517	548	546	571
iicon	646	692	671	690	697
MyWorld	583	580	575	612	642
The Living Lab	..	..	652	666	620
AMPI	549	553	585	613	639
Digital Dairy	..	..	460	472	479
media.cymru	531	543	527	577	546
Midlands Advanced Ceramics	615	613	633	615	632
SmartNanoNI*	720	738	743	776	798
UK Total (excl. Northern Ireland)*	529	540	552	570	587

Source: ONS (ASHE)

Note: Median gross weekly pay for full time adults calculated as the weighted median gross weekly pay by project 'sector-region'. Sector-region is identified by the SIC07 two digit codes and NUTS3 areas covered by each project.
** Northern Ireland is not covered by the available Annual Survey of Hours and Earnings data. For projects in Northern Ireland the table reports median gross weekly pay by project sector only, not region (SIC07 five digit SIC codes covered by these projects).*
.. Data suppressed for projects covering Scotland, Smart Data Foundry , The Living Lab, and Digital Dairy in 2015/2016.

Figure 6 shows the geographies of the SIPF projects, compared with ASHE data on median gross weekly pay by region only from 2021 (as reported in the Levelling Up White Paper). This data can give us an understanding of how earnings in the SIPF-funded regions compare to earnings in other parts of the UK.

- **Northern Ireland (Decarbonising Maritime Transportation and SmartNanoNI).** Both projects based in Northern Ireland span geographies that include Belfast, which has average weekly pay around the middle of the UK distribution, as well as areas in the lowest bin/bucket of average weekly pay, such as Ards and North Down (Decarbonising Maritime Transportation), and Derry City and Strabane (SmartNanoNi).

- **South Wales (CS Connected and media.cymru).** Most of the geographies covered by both SIPF-funded projects (including Cardiff) have relatively low levels of average weekly pay, falling in the second lowest bin/bucket of the distribution.

- **Scotland/Cumbria (Digital Dairy, The Living Laboratory and Smart Data Foundry.** The regions in which SIPF-funded projects are based in Scotland/Cumbria are mixed in terms of average weekly

pay. Both Edinburgh and Glasgow, where the lead partners for Smart Data Foundry (University of Edinburgh) and The Living Laboratory (University of Glasgow) are based, have weekly pay around the middle of the UK distribution. Digital Dairy covers a large area, which includes some regions with lower average weekly pay (e.g. Dumfries and Galloway) and higher average weekly pay (e.g. Copeland).

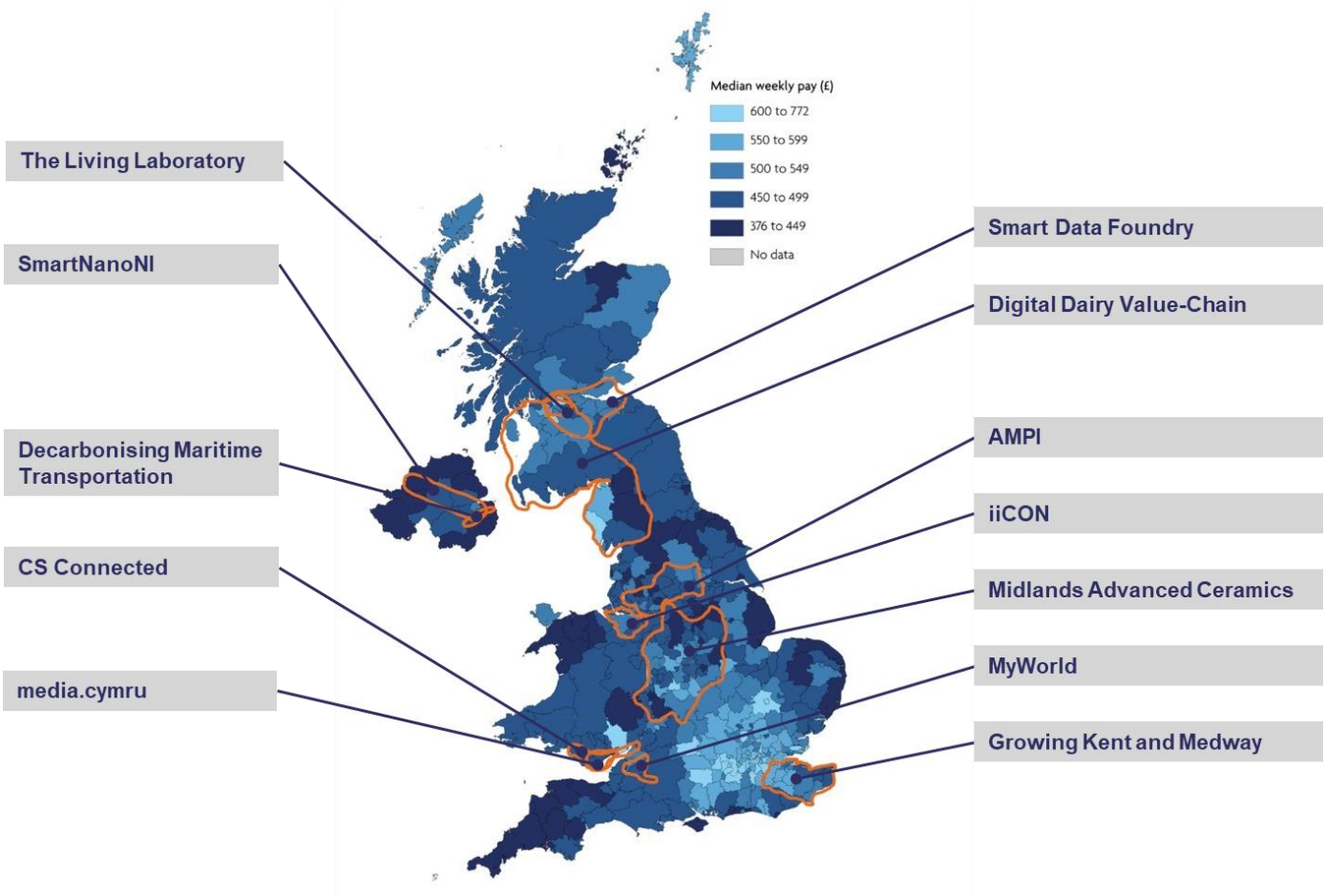
- **North West England/Yorkshire and the Humber (AMPI and iicon).** The areas covered by AMPI include some of the those with the lowest average weekly pay in the UK, e.g. Rochdale (where AMPI is registered). Liverpool, where the lead partner for iicon (Liverpool School of Tropical Medicine) is based, also has relatively low average weekly pay (falling within the second lowest bin/bucket).

- **Midlands (Midlands Advanced Ceramics).** Midlands Advanced Ceramics covers a large geographical area which is very mixed in terms of average weekly pay. The project lead (Lucideon) is registered in Stoke-on-Trent, which has relatively low weekly pay (falls within the second lowest bin/bucket). However, the geography also includes Solihull, which falls within the highest bin/bucket.

- **South West England (MyWorld).** The geography covered by MyWorld has relatively low average weekly pay. Most of the area falls within the second lowest bin/bucket of the distribution, although the City of Bristol (where the lead organisation – the University of Bristol – is based), falls within the middle bin/bucket.

- **South East England (Growing Kent and Medway).** Growing Kent and Medway covers a diverse area in terms of average weekly pay. For example, Tunbridge Wells falls within the second highest bin/bucket, whereas Rother falls within the second lowest.

FIGURE 6 SIPF PROJECTS COMPARED WITH MEDIAN GROSS WEEKLY PAY FOR ALL EMPLOYEE JOBS (2021)



Source: ONS (ASHE)

3.2.2 EQ6: DID SIPF INCREASE THE SKILLS BASE AND/OR ALTER THE PROFILE OF SKILLS IN TARGETED REGIONS? IF NOT, WHY NOT?

Secondary quantitative data sources used for baselining this EQ:

- Government data on apprenticeships
- HESA HE-BCI data on CPD courses
- Geographical data from the Levelling Up White Paper[15]

15 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1052708/Levelling_up_the_UK_white_paper.pdf

GOVERNMENT APPRENTICESHIPS DATA

Table 18 below shows participation in apprenticeships by region and subject area. The level of geographic and sectoral disaggregation and data availability varies between England and the different devolved nations, with data not split by LAD within Scotland and Northern Ireland, and this should be kept in mind when interpreting these figures. In compiling this data we have considered the most relevant available subject area recorded in the data for each project. However, some subject areas are more closely related to the projects than others and apprenticeship numbers can be substantially higher for subject areas that are broader in scope, such as 'manufacturing technologies'. The limited granularity of the data means that it may not be possible to robustly identify impacts of individual projects, however, this data provides some context against which to assess project level primary data and qualitative assessment.

TABLE 18 NUMBER OF PEOPLE CURRENTLY IN AN APPRENTICESHIP BY REGION AND SECTOR

PROJECT	REGION	SUBJECT AREA	2017/18	2018/19	2019/20
Decarbonising Maritime Transportation	Northern Ireland	Engineering	887	759	696
CS Connected	Project LADs	Engineering: Engineering Manufacture	754	569	805
Smart Data Foundry	Scotland	Data Analytics Technical Apprenticeship	No data	18	64
Growing Kent and Medway	Project LADs	Horticulture and Forestry	173	159	No data
iicon	Project LADs	Science	103	35	No data
MyWorld	Project LADs	Media and Communication	41	50	No data
The Living Lab	Scotland	Life Science and Related Science Industries	57	55	54
AMPI	Project LADs	Manufacturing Technologies	12,036	8,722	No data
Digital Dairy	Project LADs + Scotland	Agriculture / Food Manufacture	315	215	No data
media.cymru	Project LADs	Media and Communication / Media and Design	0	0	0
Midlands Advanced Ceramics	Project LADs	Manufacturing Technologies	21,685	16,381	No data
SmartNanoNI	Northern Ireland	Engineering	887	759	696

Source: ONS, Skills Development Scotland, Stats Wales, Department for the Economy (Northern Ireland)

Note: Data not available by local authority district for Northern Ireland or Scotland. ONS data for English LADs is not available at time of writing for the SSAT2 level for 2019/20.

HESA HE-BCI DATA ON CPD COURSES

In addition to apprenticeships, we have considered data on Continuing Professional Development (CPD) courses and Continuing Education (CE) courses for business and the community, provided by the HE provider partners of SIPF projects. Table 19 below shows the total learner days of CPD and CE courses delivered by HE provider partners of the SIPF projects. As for other HESA HE-BCI data, this data is not split by subject and so we cannot be certain if the CPD and CE courses recorded are relevant to the subject areas

of the SIPF projects.[16] In practice, this means that this data cannot reliably be used for identifying quantitative impacts of individual projects. Rather, the potential use of the data is in providing context as to the baseline levels of CPD courses provided by the HE provider partners of SIPF projects, against which to compare primary project data on project outcomes.

TABLE 19 TOTAL LEARNER DAYS OF CPD AND CE COURSES DELIVERED

PROJECT	HE PROVIDER PARTNERS	2015/16	2016/17	2017/18	2018/19	2019/20
Decarbonising Maritime Transportation	Queens University, Ulster University, Belfast MET*	42,038	38,737	44,359	34,866	40,838
CS Connected	Cardiff University, Swansea University	60,268	101,237	89,648	100,109	78,504
Smart Data Foundry	University of Edinburgh	No Data	No Data	No Data	No Data	No Data
Growing Kent and Medway	University of Kent, University of Greenwich	68,300	92,375	95,764	101,340	109,900
iicon	University of Liverpool , Liverpool School of Tropical Medicine	64,521	99,713	66,940	169,996	119,848
MyWorld	University of Bristol, University of the West of England, University of Bath, Bath Spa University	66,375	69,044	70,311	82,485	71,720
The Living Lab	University of Glasgow	No Data	No Data	No Data	No Data	No Data
AMPI	The University of Huddersfield, The University of Leeds, The University of Manchester, The University of Salford	140,936	150,717	292,340	320,057	353,794
Digital Dairy	SRUC, The University of Strathclyde, The University of the West of Scotland	1,500	1,800	1,500	1,350	4,980
media.cymru	Cardiff Metropolitan University, Cardiff University, University of South Wales	134,104	171,637	154,017	165,110	125,763
Midlands Advanced Ceramics	The University of Birmingham, The University of Leicester, Loughborough University	62,592	60,831	63,166	64,224	50,791
SmartNanoNI	North West Regional College, Queen's University Belfast, Ulster University	42,038	38,737	44,359	34,866	40,838

Source: HESA

[16] Given these metrics are not split by subject, where projects have the same academic partners, there is some overlap.

Note: No data available for Belfast MET, University of Edinburgh, or University of Glasgow. Figures represent the total for all HE provider partners of each project.

While we have included data on apprenticeships and CPD courses as part of our baselining, it should be noted that increasing apprenticeships and CPD courses is not necessarily a direct aim of all projects and the feasibility of apprenticeships and CPD courses will differ between the projects and their subject areas. Therefore, it is particularly important to also consider qualitative and contextual evidence relating to skills and skills development.

GEOGRAPHICAL DATA FROM THE LEVELLING UP WHITE PAPER

Figure 7 shows the geographies of the SIPF projects, compared with ONS data on the proportion of the population aged 16-64 with level 3+ qualifications by local authority (and Northern Ireland as a whole) in 2019 (as reported in the Levelling Up White Paper). This data is less granular than the apprenticeship and HESA data, above, in that it applies to all sectors. Nevertheless, it is useful for understanding the geographies of the projects which received SIPF funding.

The data suggests that:

- **Northern Ireland (Decarbonising Maritime Transportation and SmartNanoNI).** The proportion of the population with level 3+ qualifications in Northern Ireland is at the lower end of the UK distribution. Of the five discreet data bin/buckets formed from the GVA data, Northern Ireland falls within the second lowest.

- **South Wales (CS Connected and media.cymru).** The proportion of the population with level 3+ qualifications in South Wales is mixed. It is high in the Cardiff region (where Cardiff University, the lead partner for both SIPF-funded projects, is based) but lower in surrounding regions such as Caerphilly.

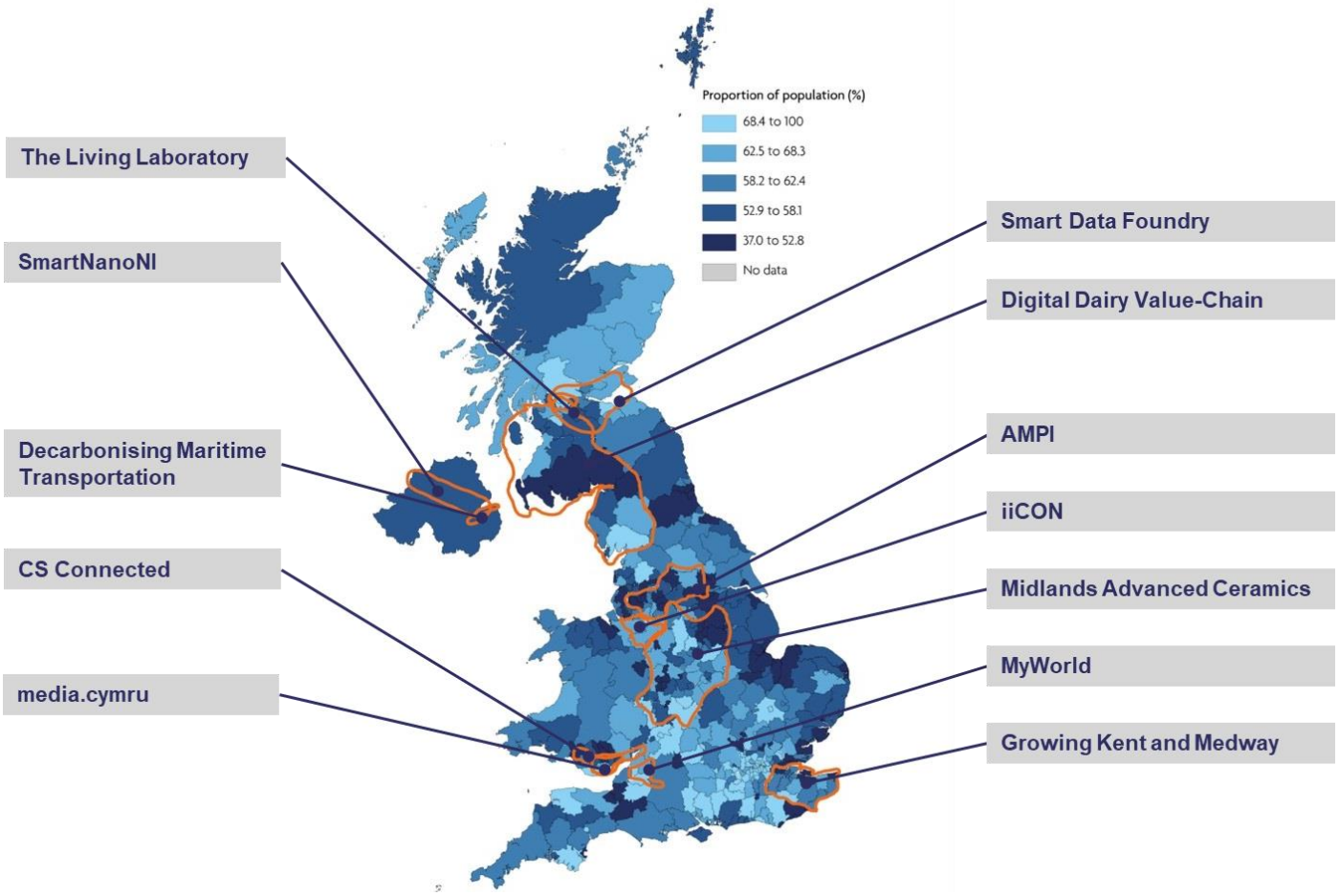
- **Scotland/Cumbria (Digital Dairy, The Living Laboratory and Smart Data Foundry.** The regions in which SIPF-funded projects are based in Scotland/Cumbria are mixed in terms of the proportion of the population with level 3+ qualifications. Both Edinburgh, where the lead partner for Smart Data Foundry (University of Edinburgh) is based, and Glasgow City (The Living Laboratory – led by the University of Glasgow), have relatively high proportions: Edinburgh falls within the highest bin/bucket; Glasgow within the second highest. Digital Dairy covers a large area, which includes some regions with very low proportions, e.g. Dumfries and Galloway (falls within lowest bin/bucket).

- **North West England/Yorkshire and the Humber (AMPI and iicon).** The areas covered by AMPI include some of the those with the lowest proportion of the population with level 3+ qualifications in the UK, including Wakefield and Doncaster. Liverpool, where the lead partner for iicon (Liverpool School of Tropical Medicine) is based, also has a relatively low proportion (falling within the second lowest bin/bucket).

- **Midlands (Midlands Advanced Ceramics).** Midlands Advanced Ceramics covers a large geographical area which is very mixed in terms of the proportion of the population with level 3+ qualifications. The project lead (Lucideon) is registered in Stoke-on-Trent, which falls within the lowest bin/bucket. However, the geography also includes Stratford-on-Avon, which has amongst the highest proportion in the UK.

- **South West England (MyWorld).** The geography covered by MyWorld has a relatively high proportion of the population with level 3+ qualifications – all areas within the geography fall within the highest three bins/buckets of the distribution.
- **South East England (Growing Kent and Medway).** Growing Kent and Medway covers a diverse area in terms of the proportion of the population with level 3+ qualifications. For example, Swale falls within the lowest bin/bucket, whereas Tunbridge Wells falls within the highest.

FIGURE 7 SIPF PROJECTS COMPARED WITH THE PROPORTION OF THE POPULATION AGED 16-64 WITH LEVEL 3+ QUALIFICATIONS (2021)



Source: ONS (Annual Population Survey)

EQ6: QUALITATIVE FINDINGS

Our qualitative baselining exercises revealed a large number of perceived skills gaps in SIPF-funded sectors.

First, the respondents described a need for increased **technical** skills of all kinds. This includes STEM skills, in general, with several stakeholders highlighting gaps in science (particularly physics and data

science) and engineering, and PhD-level graduates. In the **maritime** sector, we were told of skills gaps around electrification, clean technologies, autonomy maritime design and naval architecture. Many respondents described the need for high-tech **digital** skills, including web development, software and cyber security, particularly in the **finance services** sector, and virtual/augmented reality in the **media** sector.

There were also several references to computational and statistical literacy, including data analytics and interpretation (e.g. AI/machine learning). For example, a respondent from Scottish Enterprise stated that 'Scotland needs around 13,000 new people to work in tech every year'. An interviewee from the **precision medicine** sector highlighted bioinformatics and molecular pathology as recognised gaps. In **ceramics manufacturing**, we were told of a gap in expertise around ceramic matrix composites.

There also appears to be a gap in practical technical skills in several areas. This was a particular issue for the **agriculture sector**, where we were told of shortages in skills relating to the production of food crops, skilled machine operation and expertise to implement and support technology use across the agri-food supply chain. Brexit and the Covid-19 pandemic were cited as drivers of skills shortages in this sector. There were perceived gaps in terms of clinical skills in the **health and care** sector. Referring to **photonics**, a respondent highlighted a gap in vocational training provision in the skills required by high-tech manufacturing, e.g. cleanroom skills.

In the **creative industries,** we were told of shortages in virtual production, use of render engines, immersive media and general studio process skills (including basic mechanical and electrical skills). Respondents reported that skills gaps in the creative industries were most acute at the intermediate experience level, e.g. in roles such as Production Coordinator or Production Manager.

A number of stakeholders noted an **ageing workforce** of high-skilled workers (e.g. in **manufacturing (particularly ceramics), financial services, dairy** and **maritime**), with limited re-skilling opportunities for younger workers. Within the **creative industries**, a lack of apprentices was highlighted, along with limited access and progression routes.

In **ceramics manufacturing**, one respondent described a very limited number of ceramics-specific training courses (most courses are broader and cover ceramics as part of wider academic undergraduate or postgraduate programmes). We were also told that training opportunities previously run through technical colleges had now closed down. Another respondent explained that there was a lack of materials-focussed skills training at level 6 and that the pipeline of materials- or manufacturing focussed graduates was also low. In addition, we were told that a significant number of postgraduate students are international and return to their home countries after completing their training. More broadly, respondents relayed the view that ceramics is viewed by potential trainees/employees as an 'industry without a future'.

Several stakeholders highlighted a lack of **softer skills** across the various industries**.** This included skills such as management (particularly management skills for innovation), leadership and international experience. A respondent in the **agriculture** sector referred to a gap in 'generic skills for business', including communication skills.

Finally, respondents highlighted issues affecting **regions/devolved nations**, including the high-level skills profile in Wales (see box), and dominance of the 'golden triangle' (Oxford, Cambridge and London), particularly in pharmaceuticals.

SKILLS PROFILE OF WALES

"Wales has a workforce with generally lower overall skills levels that the UK average. The reasons for this are complex – employers continue to report skills gaps, but skills supply is generally good – vocational skills supply is strong through a high quality FE (further education) sector. Policy makers are concerned about 1) a loss of talent (especially graduates) from Wales, attracted by better opportunities elsewhere and 2) potential issues of low aspirations particular in more deprived areas." **Academic consultation respondent, Wales**

In addition, respondents identified a range of organisations seeking to address skills needs across the sectors and regions. These included:

- Higher and further education institutions
- Higher education-industry partnerships, e.g. Rolls-Royce University Technology Centre in Manufacturing
- National/Devolved government departments, e.g. BEIS, MHCLG, DHSC, OLS, Department for the Economy (Matrix NI)
- National skills bodies, e.g. Skills Development Scotland
- Sector-specific skills bodies, e.g. ScreenSkills, Screen Alliance Wales (creative industries), Lantra/Lantra Scotland (land-based industries)
- Learned Societies, e.g. Royal College of Physicians, Royal Academy of Engineers
- Professional bodies, e.g. Chartered Banker Institute, ScotlandIS (Digital Technologies), Maritime UK, Photonics Leaderships Group
- Local/Combined Authorities, e.g. Liverpool City Region Employment and Skills Board, West of England Combined Authority (WECA) Creative Sector Growth Programme
- Teaching Hospitals
- Research Councils
- Regional Skills Partnerships (Wales)
- Local Growth Deals (England and Wales); Regional Growth Deals (Scotland)
- Research institutions, e.g. Wellcome Sanger Institute (precision medicine), Advanced Manufacturing Research Centre
- Chambers of Commerce

3.3 ECONOMIC IMPACT

3.3.1 EQ7: DID SIPF-FUNDED ACTIVITIES CONTRIBUTE TO IMPROVED ECONOMIC PERFORMANCE, PARTICULARLY WITHIN TARGETED INDUSTRIES AND REGIONS? IF SO, WAS THE IMPROVEMENT SUSTAINED? IF NOT, WHY NOT?

Secondary quantitative data sources used for baselining this EQ:

- BSD data on employment, turnover and productivity
- ABS data on gross value added

- Geographical data from the Levelling Up White Paper[17]

BSD AND ABS DATA

In addition to Table 16 above, which shows total employment by project 'sector-region', Table 20 below shows total annual turnover by project sector-region (defined and identified in the same way). As for employment, turnover varies considerably between project sector-regions, partly reflecting differences in the baseline level of activity in the targeted sector-regions and partly reflecting differences in the geographic and sectoral scope of the projects.

For most project sector-regions, turnover has been somewhat less stable than employment over the baseline period 2015-2019. We see large movements year to year for CS connected, Smart Data Foundry, iicon, Digital Dairy, and media.cymru. In the case of iicon, where there is a particularly large change in 2017, our understanding is that this was due to a large new AstraZeneca site built in Macclesfield around this time. The other project sector-regions have generally exhibited upward trends of varying degrees.

As with the employment data from the BSD, even with the relatively fine granularity of disaggregation available, it is unlikely that we will be able to observe impacts of the individual projects in this data. This is especially true for projects in large sector-regions. However, this data provides sector-regional trends to contextualise project level primary outcomes.

TABLE 20 TURNOVER BY PROJECT SECTOR-REGION

PROJECT	TURNOVER (£000s)				
	2015	2016	2017	2018	2019
Decarbonising Maritime Transportation	1,094,481	1,217,066	1,312,393	1,218,131	1,387,725
CS Connected	2,948,938	793,827	827,937	1,559,126	1,788,980
Smart Data Foundry	114,629,083	112,954,939	89,884,451	101,704,702	107,725,361
Growing Kent and Medway	6,109,721	6,266,996	6,080,671	7,015,774	6,528,698
iicon	550,069	590,755	9,808,488	10,559,676	5,986,780
MyWorld	2,225,767	2,269,105	2,485,134	2,444,551	2,458,756
The Living Lab	110,376	112,947	127,383	122,645	120,097
AMPI	5,557,464	5,579,398	5,411,459	5,998,207	6,373,422
Digital Dairy	342,909	1,124,212	656,153	528,027	614,767
media.cymru	171,443	148,194	171,652	454,558	246,733
Midlands Advanced Ceramics	6,553,089	7,984,461	8,249,908	8,098,676	8,232,452
SmartNanoNI	972,925	1,235,723	1,575,873	1,538,609	1,750,281

Source: ONS (BSD)

Note: Table shows total turnover by project 'sector-region'. Sector-region is identified by the SIC07 five digit codes and partial post code areas covered by each project.

17 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1052708/Levelling_up_the_UK_white_paper.pdf

Table 21 below shows a measure of productivity, Gross Value Added (GVA) per employee, by project sector-region. This data is taken from the Annual Business Survey (ABS). Given the sample size of this survey, the finest granularity at which project sector-regions could be identified was SIC two digit level and NUTS3 region. This is a relatively coarse level of granularity and would be unlikely to allow identification of project impacts but does provide some broad sector-regional trends. We can also use these estimates of productivity to proxy for total GVA by project sector-region using the finer granularity BSD data, as shown in Table 23 below.

For the two projects in Northern Ireland, as the ABS does not cover Northern Ireland, GVA per worker is calculated based on sector only, not region. This may inflate estimated GVA per worker for these projects. Additionally, due to limited coverage of the Living Lab sector-region in the ABS, GVA per worker for this project is calculated based only on the project region. This likely reduces the estimated GVA per worker for this project.

For the Smart Data Foundry, because the ABS does not cover the financial economy, Table 21 reports GVA per worker in Scottish financial and insurance industries as reported by the OECD Regional Economy dataset.[18]

TABLE 21 GVA PER WORKER

PROJECT	GVA PER WORKER (£000s)				
	2015	2016	2017	2018	2019
Decarbonising Maritime Transportation*	83	83	89	99	96
CS Connected	75	80	103	97	98
Smart Data Foundry **	100	112	107	115	No data
Growing Kent and Medway	52	57	60	62	62
iicon	137	149	143	131	136
MyWorld	44	45	47	47	48
The Living Lab***	41	37	40	42	41
AMPI	51	58	62	59	64
Digital Dairy	54	49	49	53	61
media.cymru	27	41	30	60	53
Midlands Advanced Ceramics	52	57	59	61	63
SmartNanoNI*	72	70	72	74	80

Source: ONS (ABS) and OECD

Note: Table shows GVA to employment ratio (as recorded in the Annual Business Survey). Sector-region is identified in the Annual Business Survey by SIC07 two digit codes and NUTS3 areas covered by each project (apart from the exceptions below).
** Northern Ireland is not covered by the Annual Business Survey. For projects in Norther Ireland, the GVA to employment ratio is calculated in the Annual Business Survey by project sector only, not region (SIC07 five digit SIC codes covered by these projects).*
*** The financial sector is not covered by the Annual Business Survey. For the financial sector project Smart Data Foundry , the GVA to employment ratio reported is GVA in financial and insurance activities per worker in Scotland, taken from the OECD Regional Economy dataset (data for 2019 not yet available).*
**** Due to limited coverage of The Living Lab sector-region in the Annual Business Survey, the GVA to employment ratio is calculated in the Annual Business Survey by project region only, not sector (partial post codes covered by the project).*

[18] OECD Regional Economy data is not currently available for Scotland for 2019.

Table 22 and Table 23 below show estimates of total annual GVA by project sector-region. These estimates are a proxy based on combining GVA per worker and GVA to turnover ratios calculated from the less granular ABS with employment and turnover by project sector-region, as recorded in the more granular BSD.[19] In particular, Table 22 shows the GVA to turnover ratio multiplied by sector-region turnover and Table 23 shows GVA per worker multiplied by sector-region employment.

For each project, the estimates in Table 22 and Table 23 are generally similar. One exception is Smart Data Foundry, where GVA estimates based on turnover are substantially higher in 2015 and 2018. This is likely due to the limitations of the ABS not covering the financial economy, reducing the reliability of the estimated GVA to turnover ratio. While Table 19 is based exclusively on ABS and BSD data, Table 23 uses GVA per worker in Scottish financial and insurance industries, as reported by the OECD, which likely provides the more reliable proxy between the two estimates. Another exception is The Living Lab, which again has issues with identifying a relevant sector-region in the ABS.

Estimated GVA generally matches trends in employment and turnover, with estimates based on employment being more stable over time. Table 23Figure 8 below shows trends in estimated GVA (based on employment), with most project sector-regions showing upward trends of varying degrees over the baseline period.

TABLE 22 ESTIMATED GVA BY PROJECT (BASED ON AVERAGE TURNOVER TO GVA RATIOS)

PROJECT	ESTIMATED GROSS VALUE ADDED (£000s)				
	2015	2016	2017	2018	2019
Decarbonising Maritime Transportation*	511,670	582,821	619,613	594,062	661,179
CS Connected	1,339,022	358,535	397,380	715,999	794,289
Smart Data Foundry **	38,438,028	25,498,532	27,329,862	36,044,436	43,525,392
Growing Kent and Medway	1,133,960	1,301,813	1,207,395	1,391,131	1,439,558
iicon	176,952	193,055	3,100,117	3,363,095	1,882,312
MyWorld	1,151,218	1,279,473	1,328,328	1,290,662	1,379,361
The Living Lab***	40,825	38,886	45,209	43,939	42,659
AMPI	2,427,170	2,489,829	2,505,205	2,598,526	2,704,935
Digital Dairy	89,477	254,032	140,562	117,141	128,550
media.cymru	43,805	61,532	53,771	224,654	114,539
Midlands Advanced Ceramics	2,977,032	4,055,445	4,219,722	4,004,298	4,049,798
SmartNanoNI*	492,092	603,039	771,716	718,756	808,964

Source: ONS (ABS and BSD)

Note: Table shows estimated Gross Value Added (GVA) by project 'sector-region'. GVA is estimated my multiplying sector-region turnover (as recorded in the Business Structure Database) and the sector-region GVA to turnover ratio (as recorded in the Annual Business Survey). Sector-region is identified in the Business Structure Database by the SIC07 five digit codes and partial post code areas covered by each project. Sector-region is identified in the Annual Business Survey by the SIC07 two digit codes and NUTS3 areas covered by each project (apart from the exceptions below).
** Northern Ireland is not covered by the Annual Business Survey. For projects in Norther Ireland, the GVA to turnover ratio is calculated in the Annual Business Survey by project sector only, not region (SIC07 five digit SIC codes covered by these projects).*
*** The financial sector is not covered by the Annual Business Survey. For the financial sector project Smart Data Foundry, the GVA to turnover ratio is calculated in the Annual Business Survey by project region only, not sector (partial post codes covered by the project).*
**** Due to limited coverage of The Living Lab sector-region in the Annual Business Survey, the GVA to turnover ratio is calculated in the Annual Business Survey by project region only, not sector (partial post codes covered by the project).*

[19] The BSD does not include data on GVA, hence the need to proxy for GVA in this way.

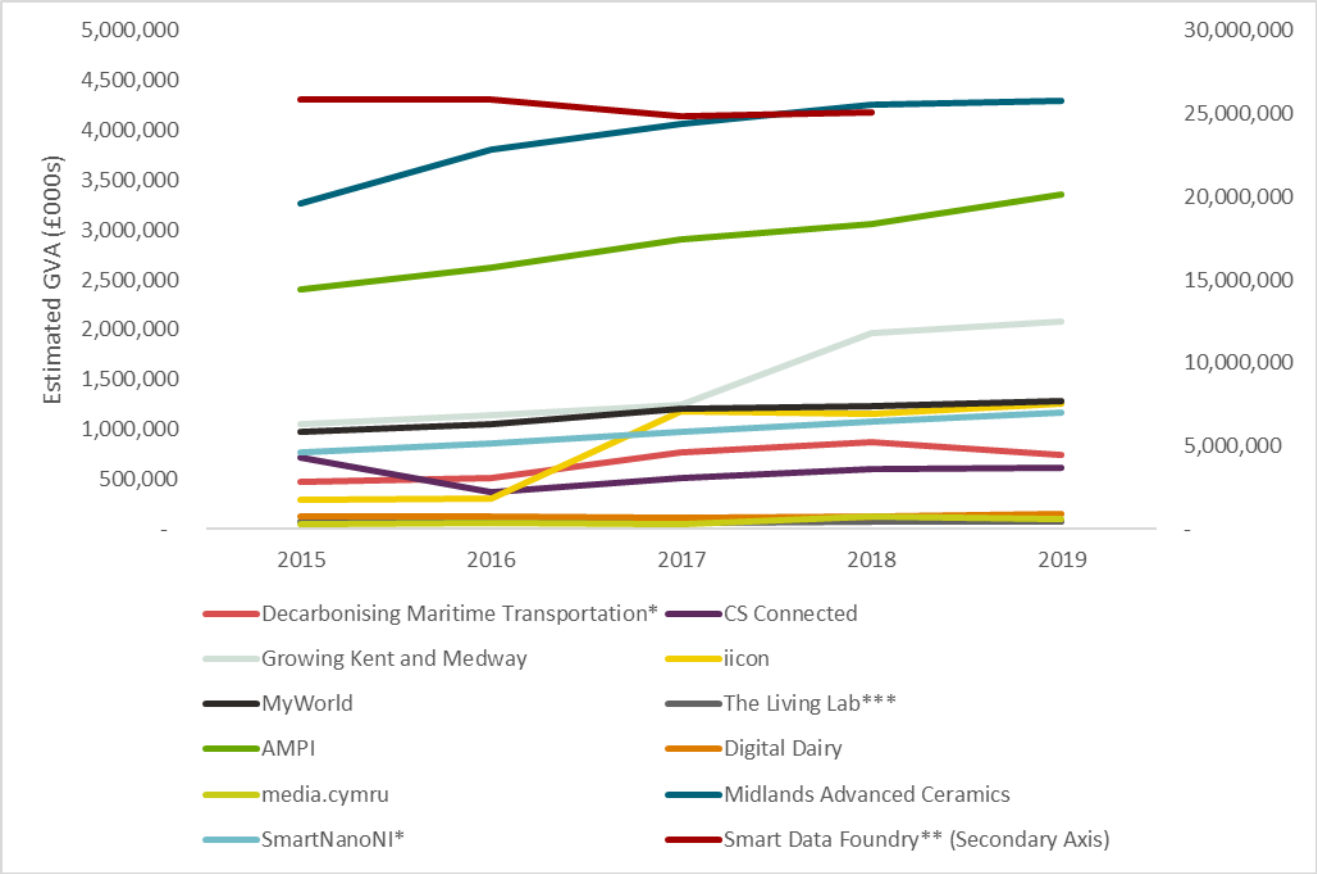
TABLE 23 ESTIMATED GVA BY PROJECT (BASED ON AVERAGE EMPLOYMENT TO GVA RATIOS)

PROJECT	ESTIMATED GROSS VALUE ADDED (£000s)				
	2015	2016	2017	2018	2019
Decarbonising Maritime Transportation*	478,971	516,439	771,243	876,708	751,132
CS Connected	721,864	375,243	507,983	601,753	622,482
Smart Data Foundry**	25,870,920	25,864,525	24,870,575	25,036,193	No data
Growing Kent and Medway	1,050,146	1,147,045	1,243,497	1,962,785	2,076,209
iicon	298,750	312,561	1,180,528	1,160,213	1,261,919
MyWorld	977,419	1,049,567	1,210,667	1,232,435	1,281,302
The Living Lab***	71,670	63,939	70,366	79,098	81,367
AMPI	2,407,050	2,620,612	2,906,030	3,060,753	3,357,113
Digital Dairy	131,456	129,245	119,573	131,289	150,034
media.cymru	48,338	66,217	55,108	134,645	104,975
Midlands Advanced Ceramics	3,271,197	3,811,502	4,060,017	4,261,465	4,291,856
SmartNanoNI*	769,539	858,692	976,746	1,077,517	1,163,633

Source: ONS (BSD and ABS) and OECD

Note: Table shows estimated Gross Value Added (GVA) by project 'sector-region'. GVA is estimated my multiplying sector-region employment (as recorded in the Business Structure Database) and the sector-region GVA to employment ratio (as recorded in the Annual Business Survey). Sector-region is identified in the Business Structure Database by the SIC07 five digit codes and partial post code areas covered by each project. Sector-region is identified in the Annual Business Survey by the SIC07 two digit codes and NUTS3 areas covered by each project (apart from the exceptions below).
** Northern Ireland is not covered by the Annual Business Survey. For projects in Norther Ireland, the GVA to employment ratio is calculated in the Annual Business Survey by project sector only, not region (SIC07 five digit SIC codes covered by these projects).*
*** The financial sector is not covered by the Annual Business Survey. For the financial sector project Smart Data Foundry, the GVA to employment ratio reported is GVA in financial and insurance activities per worker in Scotland, taken from the OECD Regional Economy dataset (data for 2019 not yet available).*
**** Due to limited coverage of The Living Lab sector-region in the Annual Business Survey, the GVA to employment ratio is calculated in the Annual Business Survey by project region only, not sector (partial post codes covered by the project).*

FIGURE 8 ESTIMATED GVA BY PROJECT (BASED ON GVA TO EMPLOYMENT RATIOS)



Source: ONS (BSD and ABS) and OECD

Note: Figure shows estimated Gross Value Added (GVA) by project 'sector-region'. GVA is estimated my multiplying sector-region employment (as recorded in the Business Structure Database) and the sector-region GVA to employment ratio (as recorded in the Annual Business Survey). Sector-region is identified in the Business Structure Database by the SIC07 five digit codes and partial post code areas covered by each project. Sector-region is identified in the Annual Business Survey by the SIC07 two digit codes and NUTS3 areas covered by each project (apart from the exceptions below).
** Northern Ireland is not covered by the Annual Business Survey. For projects in Norther Ireland, the GVA to employment ratio is calculated in the Annual Business Survey by project sector only, not region (SIC07 five digit SIC codes covered by these projects).*
*** The financial sector is not covered by the Annual Business Survey. For the financial sector project Smart Data Foundry, the GVA to employment ratio reported is GVA in financial and insurance activities per worker in Scotland, taken from the OECD Regional Economy dataset (data for 2019 not yet available).*
**** Due to limited coverage of The Living Lab sector-region in the Annual Business Survey, the GVA to employment ratio is calculated in the Annual Business Survey by project region only, not sector (partial post codes covered by the project).*

GEOGRAHPICAL DATA FROM THE LEVELLING UP WHITE PAPER

Finally, Figure 9**Error! Reference source not found.** shows the geographies of the SIPF projects, compared with ONS data on nominal GVA per hour worked by local authority (and Northern Ireland as a whole) in 2019 (as reported in the Levelling Up White Paper). This data is less granular than the BSD and ABS data, above, in that it applies to all sectors. Nevertheless, it is useful for understanding the geographies of the projects which received SIPF funding.

The data suggests that:

- **Northern Ireland (Decarbonising Maritime Transportation and SmartNanoNI).** GVA per hour worked in Northern Ireland is at the lower end of the UK distribution. Of the five discreet data

bin/buckets formed from the GVA data, Northern Ireland, as a whole, falls within the second lowest.

- **South Wales (CS Connected and media.cymru).** South Wales also has relatively low GVA per hour worked – no areas of South Wales fall within the highest or second highest bin/buckets of the GVA distribution. However, both CS Connected and media.cymru are led by Cardiff University, and the Cardiff region appears to have the highest GVA in Wales.

- **Scotland/Cumbria (Digital Dairy, The Living Laboratory and Smart Data Foundry.** The regions in which SIPF-funded projects are based in Scotland/Cumbria are mixed in terms of GVA per hour worked. Edinburgh, where the lead partner for Smart Data Foundry (University of Edinburgh) is based, has relatively high GVA per hour worked (falls within the second highest bin/bucket), whereas Glasgow City (The Living Laboratory – led by the University of Glasgow) has lower GVA per hour worked (middle bin/bucket). Digital Dairy covers a large area, which includes some regions with very low GVA per hour worked, e.g. East Ayrshire and Allerdale.

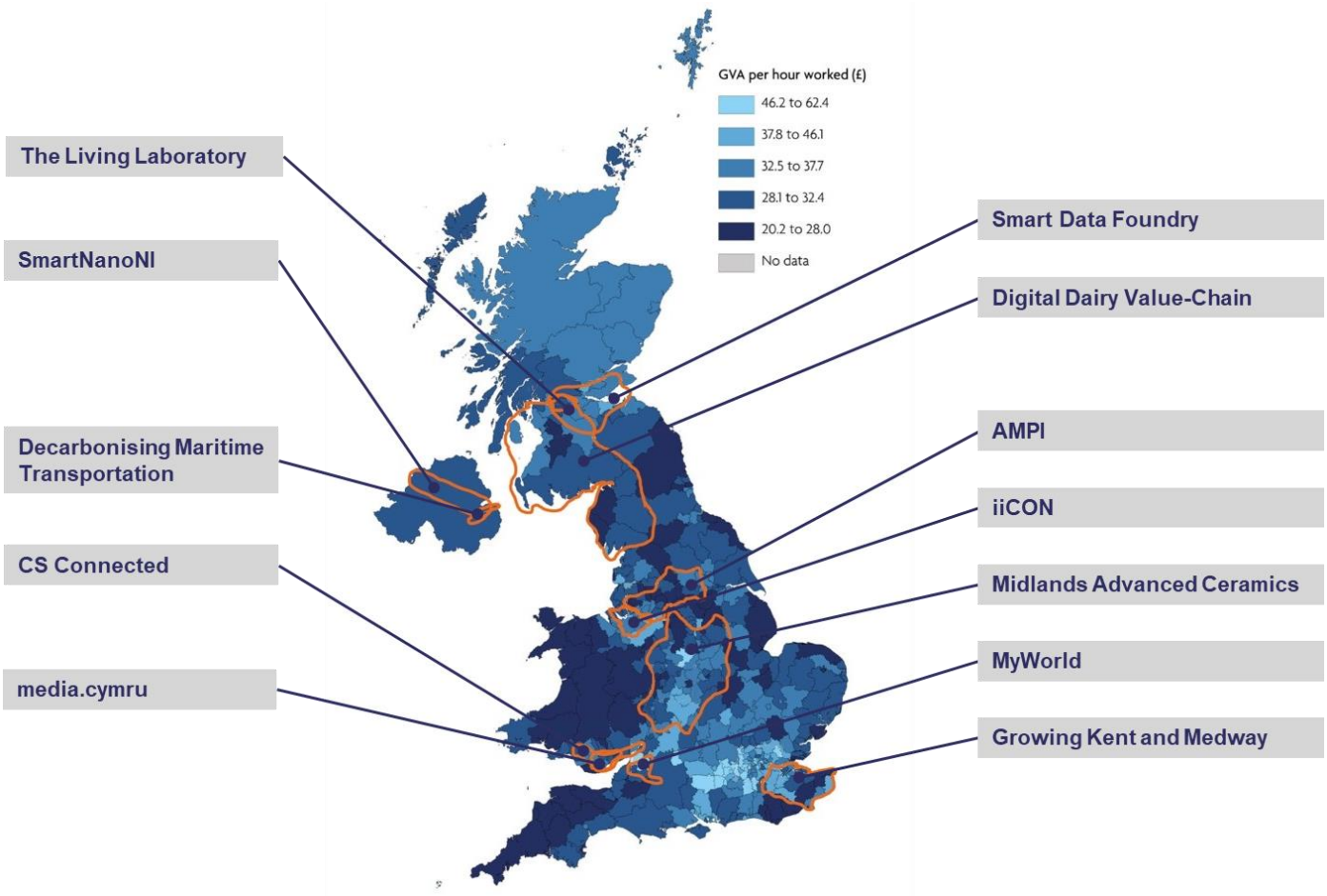
- **North West England/Yorkshire and the Humber (AMPI and iicon).** The areas covered by AMPI (registered in Rochdale) include some of the those with the lowest GVA per hour worked in the UK. Liverpool, where the lead partner for iicon (Liverpool School of Tropical Medicine) is based, also has relatively low GVA per hour worked (falling within the second lowest bin/bucket).

- **Midlands (Midlands Advanced Ceramics).** Midlands Advanced Ceramics covers a large geographical area which is very mixed in terms of GVA per hour worked. The project lead (Lucideon) is registered in Stoke-on-Trent, which has relatively low GVA (falls within the second lowest bin/bucket). However, the geography also includes South Derbyshire, which has amongst the highest GVA per hour worked in the UK.

- **South West England (MyWorld).** The geography covered by MyWorld is also very mixed: it covers South Gloucestershire (highest GVA bin/bucket); Bristol (middle bin/bucket); Bath and North East Somerset (second lowest bin/bucket); and Mendip (lowest bin/bucket).

- **South East England (Growing Kent and Medway).** Growing Kent and Medway covers a similarly diverse area in terms of GVA per hour worked. For example, Canterbury falls within the lowest bin/bucket, whereas Medway falls within the second highest.

FIGURE 9 SIPF PROJECTS COMPARED WITH NOMINAL GVA PER HOUR WORKED (2019)



Source: ONS (Subregional productivity in the UK: February 2020)

3.3.2 EQ8: DID SIPF CONTRIBUTE TO CLOSING GAPS IN ECONOMIC PERFORMANCE ACROSS UK REGIONS? IF NOT, WHY NOT?

This evaluation question has not been baselined. Evaluation of economic impact relative to comparable counterfactual regions will be undertaken at a later stage in the evaluation, utilising case studies where appropriate.

3.4 NETWORKS AND COLLABORATION

3.4.1 EQ9: DID SIPF ENHANCE AND SUSTAIN THE NATURE OF COLLABORATION AND THE COLLABORATION INFRASTRUCTURE WITHIN TARGETED INDUSTRIES, RESEARCH FIELDS AND REGIONS? IF NOT, WHY NOT?

Secondary quantitative data sources used for baselining this EQ:

- Dimensions.ai
- HESA HE-BCI data on spin-off activities

DIMENSIONS.AI

Dimensions.ai data on publications (journal articles and conference proceedings) within the SIPF project regions and subjects (Table 24) shows the number and percentage of publications with at least one industry co-author. This data shows that most SIPF project regions and subject categories had some level of industry co-authorship for the years 2015-2019 inclusive, with little variation between them (between 5% and 9%). One exception was the regions and subject categories associated with the media focused projects, MyWorld and media.cymru, which had only one collaborative publication in the period 2015-2019 between them.

TABLE 24 PUBLICATIONS WITH AT LEAST ONE INDUSTRY CO-AUTHOR (2015-19)

PROJECT	ARTICLES	PROCEEDINGS	INDUSTRY PUBLICATIONS	INDUSTRY PUBLICATIONS (%)
Decarbonising Maritime Transportation	510	49	33	5.90
CS Connected	1,917	181	144	6.86
Smart Data Foundry	3,084	2,048	316	6.16
Growing Kent and Medway	780	4	69	8.80
MyWorld	82	3	0	0.00
The Living Lab	10,830	414	817	7.27
iicon	8,138	222	429	5.13
AMPI	4,450	1,507	314	5.27
Digital Dairy	1,290	929	158	7.12
Midlands Advanced Ceramics	9,993	2,442	1237	9.95
SmartNanoNI	856	411	68	5.37
media.cymru	136	0	1	0.74

Source: Dimensions.ai

HESA HE-BCI DATA

In addition to co-authored publications with industry and the qualitative evidence below, HESA business-community interaction data on spin-off activities, shown in Table 15 above, provides metrics on commercial spin-offs of HE provider partners. This data shows substantial variation in the number, employment and turnover of HE provider commercial spin-offs. The data also shows differences between HE provider partners in terms of the proportion of active spin-offs that have been active for at least three years. However, as noted above, this data is not split by subject area and, therefore, it is uncertain the extent to which these spin-off activities relate to the subject areas of the SIPF projects. In practice, this means that this data cannot reliably be used in isolation for identifying quantitative impacts of individual projects. Rather, the potential use of the data is in providing context as to the baseline levels of spin off

activities by the HE provider partners of SIPF projects, against which to compare primary project data on project outcomes in drawing conclusions about impact.

EQ9: QUALITATIVE FINDINGS

Nature of collaboration between stakeholders

From the consultation, we found that the perceived nature of collaboration between stakeholders at baseline **varied considerably between regions and sectors**. For example, we found evidence of well-established networks for collaboration across the **life sciences** sector in the Liverpool City Region (LCR), such as the LCR Health and Life Sciences Board (administered by the LEP), which includes the Sector Leads/Departmental Heads/CEOs from the universities, hospitals, business networks and companies. The Board is a forum for knowledge and best-practice sharing, and developing initiatives to enhance the sector. Separately, the Northern Health Science Alliance (NHSA), established in 2011, brings together 24 universities, NHS trusts and Academic Health Science Networks (AHSNs).

Another example of a sector-region where collaboration appears to have been relatively strong in the baselining period is within the **creative industries** in Wales (media.cymru). Clwstwr, part of the Creative Industry Clusters Programme, is a five-year programme to create new products, services and experiences for screen (media.cymru received funding from Clwstwr before receiving SIPF funding).[20] Clwstwr has brought together the three Cardiff universities, the BBC and other partners on specific initiatives. Other examples of organisations bringing together stakeholders in the creative industries in Wales include Creative Cardiff[21], Cultural Freelancers Wales[22] and Skills Alliance Wales[23]. One respondent referred to 'a real push towards collaboration amongst businesses, training providers and educational institutes, in order to continue to grow the industry and its workforce in the best way possible'.

On the other hand, we were told of limited collaboration in several industries, where it was often described as bilateral, e.g. between one industrial and one academic partner, and on a project-by-project basis (less strategic). For example, respondents identified limited collaboration between research and business communities in the **financial services** sector. One respondent characterised the sector as having 'emerging collaboration with more room to go' and another highlighted that Fintech collaboration is improving following the establishment of Fintech Scotland in 2018. With reference to knowledge-sharing between and academic and financial services industry communities, a respondent from Fintech Scotland stated that 'current engagement is limited to some contributions on undergraduate training and business-specific research'. A respondent from the **dairy** industry commented that collaboration is challenging in an sector that is rural and remote by nature, and that this was complicated further by the Covid-19 pandemic.

Collaboration networks in SIPF-funded sectors

[20] https://clwstwr.org.uk/

[21] https://www.creativecardiff.org.uk/

[22] https://cfw.wales/

[23] https://www.screenalliancewales.com/

Respondents generally stated that a combination and formal and informal networks existed at baseline in their sector/region. In addition to those described above, the formal networks highlighted by respondents included:

- **Wave 1:**
  - **Decarbonising Maritime Transportation:** MarRI UK, Collaborative Growth Programme (CGP)[24]
  - **CS Connected:** Regional Skills Partnerships
  - **Smart Data Foundry :** Scottish Enterprise; Data Driven Innovation programme
  - Growing Kent and Medway: ArgiTech centres
  - **iicon:** Specialist Science Parks, e.g. Alderley Park (Cheshire)
  - **MyWorld:** Local cluster networks
  - **The Living Lab:** Public-private partnerships, particularly when collaboration with NHS or access to patients is required
  - **No specific project:** UKRI and research councils; Wales Innovation Network (WIN), following the 2020 Reid report, commissioned by Universities Wales.[25]
- **Wave 2**
  - **AMPI:** Manufacturing Technologies Association (MTA), Royal Academy of Engineers
  - **Digital Dairy:** IUK funded projects involving academia and business, research organisations, universities with regional footprints, Scottish Dairy Growth Board
  - **Midlands Advanced Ceramics:** Rolls-Royce University Technology Centres (involving University of Birmingham, Oxford University, Imperial College London), National Composites Centre, British Ceramics Confederation, UK Bathroom Manufacturers Association, Engineering and Physical Sciences Research Council (EPSRC), IUK, Defence Science and Technology Laboratory (DSTL), Manufacturing Technology Centre (MTC)
  - **media.cymru:** Clwstwr, Creative Cardiff , Cultural Freelancers Wales, Skills Alliance Wales, Institute of Welsh Affairs (IWA – particularly through its media work), Arts Council Wales, Ffilm Cymru
  - **SmartNanoNI:** KTN, Photonics Leadership Group, Institute of Physics

Impact of the place-based nature of SIPF on collaboration

While not strictly 'baseline' evidence, from the interviews, we heard views that the **place-based nature of SIPF has already been effective in driving collaboration** between stakeholders within industry, research and local government. For example, an interviewee from the Northern Irish government stated that the place element of SIPF was 'very important' in driving collaboration in the local area. With reference to SmartNanoNI, they explained that Seagate (the consortium lead) could have collaborated with 'anyone in the world' (for other funding calls) but by collaborating with local academics and SMEs through SIPF, there

[24] CGP provides financial support to networks of businesses (minimum of 4) who want to work collectively with other industry partners and stakeholders (academia and public sector) to scope and exploit new products, services and/or ways of working.

[25] https://uniswales.ac.uk/media/Strength-in-Diversity-Professor-Graeme-Reid-FINAL.pdf

were 'spill-over benefits to the local ecosystem' that will create 'economic impact running from Belfast to Derry'.

Several interviewees explained that SIPF has improved collaboration between stakeholders who were **already working together at some level**. For example, an interviewee from the Scottish Funding Council SFC said that some of the SIPF projects were 'latent' and were 'triggered or nudged' by the funding. SIPF helped to 'focus minds' and 'raise the ambitions of previously smaller plans'. This sentiment was echoed by interviewees from the Welsh government who described SIPF as 'enhancing' rather than 'driving' collaboration and stated that consortia needed to already exist to 'even have a chance at being successful in a bid'. A UK government interviewee suggested that allocating seedcorn funding may have been effective in incentivising collaboration at the beginning stages.

The SFC interviewee also said that the **place-based criterion imposed by SIPF was seen positively**, once it was understood by applicants. Prospective applicants realised they could stop 'scaling the globe for the best researchers' and focused on local organisations. In addition, *unsuccessful* projects have reported benefits of applying for SIPF funding, based on closer understanding between parties in a particular place. This can lead to future work.

However, a UK government interviewee highlighted that there may have been **missed opportunities resulting from local government not being permitted to lead on SIPF bids**. This could have empowered local structure, including Metro Mayors, to take a leadership role in R&D in local areas.

Some of these issues are relevant to the process evaluation, and are likely to be explored in more depth in that phase of work.

3.5 SOCIETAL IMPACT

3.5.1 EQ10: WAS THE REPUTATION FOR R&I OF TARGETED REGIONS AND SECTORS ENHANCED AS A RESULT OF THE SIPF FUNDING AND OUTPUTS? IF NOT, WHY NOT?

Secondary quantitative data sources used for baselining this EQ:

- Dimensions.ai data

DIMESIONS.AI

The Dimesnsion.ai data presented above in Table 9 and Table 10 on academic publications and citations for the regions and subject areas of the SIPF projects provides some indications at to the reputation of the targeted regions for academic research in these areas. As noted above, we find that for the years 2015-2019 inclusive, most project regions had publications in relevant subject categories that were highly cited compared to the average (all had average field citation ratios[26] of 1.9 or more). However, there is some variation between projects.

[26] FCR is a field-normalized citation metric. It is calculated on publications that are at least two years old. FCR is aggregated using the geometric mean. For more on FCR, please see https://dimensions.freshdesk.com/support/solutions/articles/23000018848-what-is-the-fcr-how-is-it-calculated-

EQ10: QUALITATIVE FINDINGS

Given the variety in the funded projects, the responses to the consultation questions concerning the reputation of targeted regions and sectors were, by definition, **very region and sector-specific**. Again, although they are helpful for building the baseline picture, it is important to note that the views of the individuals who responded to the consultation do not necessarily represent those of the wider region or sector.

With reference to the UK **manufacturing/materials** sector (CS Connected, Decarbonising Maritime Transportation, Midlands Advanced Ceramics, AMPI), an IUK Sector Lead stated that '[the] UK has strong track record of bilateral and multilateral R&I agreements, and the government has a commitment to deepen international partnerships and incorporate science and technology as an integral element of national security and international policy'. In **Northern Ireland specifically (Decarbonising Maritime Transportation)**, a respondent from Invest NI stated: 'Northern Ireland has a diverse and vibrant advanced manufacturing and engineering sector with experience spanning across aerospace and defence, automotive, construction, materials handling, electronics and consumer products.' Specifically on the **semi-conductor industry in Wales** (CS Connected), we were told that there was respected academic excellence and well-known industrial capability, but that there was a need to join these up and broaden their reach into wider UK collaborations.

Regarding **ceramics manufacturing** (Midlands Advanced Ceramics), a respondent from the wider industry (which uses advanced ceramics products) stated that the UK has a strong reputation for research and academic work across a wide range of materials science and engineering, built on 'solid historical pedigree'. However, more specifically, a respondent from the ceramics industry suggested that the reputation was 'somewhat nostalgic', as many manufacturing sites in the Midlands (and across the UK) have been closed. Similarly, another respondent said that ceramics is viewed by many people within the Midlands as a 'dying industry' and that it could take 'a decade' to change this view.

In **photonics** (SmartNanoNI), a respondent from the sector stated that the industry in Northern Ireland was renowned for three strengths:

1 Data storage, as exemplified by Seagate
2 Imaging, as exemplified by Thales, Oxford Instruments and Raptor Photonics
3 Datacom component testing and measurement, as exemplified by Yelo

Regarding the **agriculture** sector (Growing Kent and Medway, Digital Dairy), an IUK Sector Lead stated that the UK is among the best in the world in term of farm production standards, and highlighted the four Agritech Centres which have received strong international recognition as Innovation Centres. The respondent explained that overall productivity and resource-use efficiency is a global challenge for the sector, but one that the UK needs to address to be seen a world-leading. Specifically on the **dairy** sector in Scotland, a respondent from an Agri-Tech Centre said that academic institutions such as SRUC and the University of Strathclyde have received strong scores in the Research Excellence Framework (REF) in the relevant areas. However, we were also told that a significant amount of expertise in industry in the Borders area comes from outside of the UK (France and Denmark). We did not receive information relating specifically to the reputation of R&I in the agriculture/horticulture sector in Kent and Medway.

Referring to the **financial services** sector (Smart Data Foundry), an IUK Sector Lead described it as a 'cornerstone of the UK economy' and said that 'worldwide, the UK is seen as a hub'. Financial services for

which the UK's reputation was seen as particularly strong included fund management, pensions and banking. However, a respondent from the Financial Data and Technology Association (FDATA) said that the UK reputation is 'weakening as traditional business models get replaced … [The sector is] not innovating fast enough'. With respect to financial services in **Scotland** specifically, we were told: 'it has a significant reputation for **financial services and Fintech innovation**. Edinburgh and Glasgow combined offer the UK the second biggest financial services centre outside of London.' A respondent from Scottish Enterprise stated that Edinburgh has been trailed as the 'Data Capital of Europe' and that Scotland has an effective network of Innovation Centres, including the Data Lab and CENSIS.

Referring to the **antimicrobial resistance and vaccines** sectors (iicon), an IUK Sector Lead stated that 'the UK has a strong reputation in leading the world in developing a new business model for new antibiotics. Obviously, the UK has an excellent reputation in vaccines, post-Covid'. Referring to the **Liverpool City Region** (LCR) specifically, a respondent from Liverpool City Council explained that 'the long term presence and investment of major manufacturers such as AstraZeneca, … Bristol Myers-Squibb … [and] Teva makes LCR one of the largest biomanufacturing locations in Europe'. However, the same respondent also described a 'narrow' business base for the life sciences sector: 'There are large numbers of start-ups and smaller businesses developing in LCR, and a large biomanufacturing cluster. However, LCR is not as well-known for its larger small businesses and medium sized businesses'.

An IUK Sector Lead said of the UK **precision medicine** sector (Living Lab): '[There is a] world-recognised genomics sector …, e.g. The 100,000 Genomes Project and initiation of NHS Genomic Medicine Service. [There is an] innovative diagnostics industry, although [it is] lacking … infrastructure'. In terms of where the reputation of the UK precision medicine sector could be improved, the respondent mentioned effective digitisation and integration of patient data, as well as the scale-up of innovative diagnostics. We did not receive information relating specifically to the reputation of R&I in the precision medicine sector in Glasgow.

Of the UK's reputation in the **creative industries** (MyWorld, media.cymru), a respondent from ITV said that it was 'growing and increasingly understood' and explained that the sector trades in 'cultural goods that are often well-known here and abroad'. However, an IUK Sector Lead said that the industry had 'limited historical recognition or profile, given the scale of the sector', but mentioned that the Creative Industries Sector Deal has given the sector an 'important new profile, backed up by investment in R&D'. Particular goods for which the UK has a strong reputation include screen, fashion, design, advertising and marketing, publishing and performing arts.

Referring specifically to the Bristol/Bath region (MyWorld), we were told that natural history film-making and animation were key areas with strong reputations (responsible for 50% of the global output of natural history film-making). There is also an emerging immersive and videos industry in this region. We were also told of several areas where South Wales (media.cymru) has a strong reputation in media. These included high-end television drama (and story-telling more widely), unscripted factual production, news, games/animation courses and performing arts (mainly anchored in Cardiff). An academic consultation respondent suggested that the area's reputation could be improved further by focussing on more innovative formats for story-telling, such as immersive production.

Finally, referring to the **maritime** sector (Decarbonising Maritime Transportation), an IUK Sector Lead explained that in 2019 its reputation was as a low-tech and 'traditional' industry, lagging behind other transport sectors in innovation. Clean maritime was not a focus of the UK government, although this has changed considerably since 2019. There was also a feeling that the sector was 'ignoring' its obligations to support Net Zero targets. More positively, the reputation was strong in maritime services (with London

seen as a centre for global shipping and finance) and in specific technologies such as offshore crew transfer vessels and wind farm installation. Referring to the maritime sector in Northern Ireland, we were told that, through Queen's University Belfast and Ulster University, the region has built a strong reputation for composite materials and software. The region did once have a 'proud maritime heritage' but there has been no ship building for around 20 years.

3.5.2 EQ11: TO WHAT EXTENT (AND HOW) HAVE SIPF PROJECTS FOSTERED AN EQUAL, DIVERSE AND INCLUSIVE RESEARCH AND BUSINESS ENVIRONMENTS, AND HOW WELL DO SIPF PROJECTS ALIGN WITH UKRI ED&I AIMS?

This question has been baselined through qualitative evidence, in particular, through the stakeholder consultation. The evidence largely reflects views on the ED&I position at the *sectoral* level at baseline; evidence relating to ED&I at the project level was limited.

At a very high level, there was consensus across consultation respondents that **inequalities exist** in their industries, for example, in terms of representation of women, ethnic minorities, and people from different parts of the UK and with different socioeconomic backgrounds. As for other indicators, the following is a high-level summary of insights across the sectors but it should be noted that each one appears to face unique EDI challenges.

Financial services was described as a male dominated industry by one respondent, although another stated that there are increasing numbers of women in senior leadership roles in mature businesses. With regard to start-up activity in the financial services sector, we were told by an FDATA respondent that '[it] remained heavily skewed to male founders.' In addition, the respondent stated that 'angel and venture investment is primarily led by men, despite women controlling a higher percentage of investable assets. Data science and computing remains dominated by men'.

Similarly, the **life sciences** industry was characterised as having 'mainly white men' appointed to senior-level positions and poor representation of different ethnicities. However, it was noted that there are differences across sub-sectors. For example, in contrast to *manufacturing* in life sciences, there is significant diversity in terms of groups working in *health and care* settings.

The consultation responses suggested that poor gender and ethnic diversity was also an issue the **ceramics** industry and related materials engineering disciplines, particularly at management level. An academic respondent with expertise in advanced manufacturing described the sector within the Midlands as 'dominated by white males but with some female representation'. They suggested this appears to be the case despite diversity in the backgrounds of students studying in the region: 'it seems they do not stay in advanced manufacturing in the Midlands'. However, a number of respondents suggested that parties within the industry were making efforts to improve EDI.

The **agriculture** sector was also described as a 'closed' and 'traditional, male dominated industry', dictated by geographical and social backgrounds. Again, however, participants stressed that the industry was changing fast (although Brexit may have affected cultural diversity in the workforce, to an extent). For example, one respondent highlighted a group called Women in Agriculture (specific to Scotland), which has drawn together a collective of organisations, including the Royal Highland and Agricultural Society of

Scotland (RHASS), Scottish Association of Young Farmers (SAYFC) and the National Farmers Union Scotland (NFUS) to support women across rural Scotland.[27]

EDI was also seen as a challenge for the **semi-conductors** industry. This was seen as (at least partly) caused by a lack of diversity in those studying physics/applied physics, which has led to a limited ability to recruit diverse groups to the industry. A similar issue was highlighted for the **photonics** industry, where relatively poor gender equality was seen as 'not due to lack of will or opportunity of provision, but poor diversity in update of opportunities'. It was noted that the Institute for Physics and projects funded by the UK Research Councils were active in addressing EDI issues.

Regarding the **precision medicine** sector, an IUK Sector Lead stated: 'opportunities [are] often focussed within the 'golden triangle' of Oxford, London and Cambridge …[However, there are] pockets of opportunity elsewhere, for example, in Scotland, Northern Ireland and Manchester. Females [are] generally underrepresented, particularly at … Board level.'

Underrepresentation from deprived communities and a lack of social mobility were seen as a particular issues in the **creative industries**, with one respondent remarking that there is 'a long way to go, considering we are a reflection of the nation's culture'. More broadly, an academic respondent specialising in skills said: 'research suggests the sector is unequal (as mirrored in the rest of the UK and beyond). Women, minority groups, disabled workers and those from challenging socio-economic backgrounds are not always able to access the industry and/or progress to decision-making positions'. They also highlighted that socio-economic disadvantage in the sector is a particular issue in/for Wales.

For the **maritime** sector, we were told that it was 'not very diverse at all' but that organisations such as Maritime UK were seeking to improve EDI, e.g. through creating various networks (Women in Maritime, Mental Health in Maritime, Pride in Maritime and Ethnicity in Maritime).

3.5.3 EQ12: DID THE OUTPUTS OF SIPF IMPROVE THE HEALTH, WELLBEING AND ENVIRONMENT OF INDIVIDUALS IN TARGETED REGIONS?

Secondary quantitative data sources used for baselining this EQ:

- Geographical data from the Levelling Up White Paper[28]

We note that, in addition to the data below, we considered some available sources of geographic health outcomes data, including Office for Health Improvement and Disparities (OHID) public health profiles[29] and ONS wellbeing estimates[30]. Given the size of the individual projects, it is unlikely that they will have an attributable impact on these metrics. For the purpose of the interim and final evaluation, we will assess

[27] https://www.womeninagriculture.scot/

[28] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1052708/Levelling_up_the_UK_white_paper.pdf

[29] https://fingertips.phe.org.uk/

[30] https://www.ons.gov.uk/datasets/wellbeing-local-authority/editions/time-series/versions/2

these metrics using primary evidence and qualitative assessment, as well as evidence gathered through project-level evaluations.

GEOGRAPHICAL DATA FROM THE LEVELLING UP WHITE PAPER

Figure 10 shows the geographies of the SIPF projects, compared with ONS data on **female healthy life expectancy** at birth by region in 2017-2019, as reported in the Levelling Up White Paper. In general, there appears to be an urban-rural divide, where urban areas have lower female healthy life expectancy and rural areas have higher. For brevity, we have not included the map for male healthy life expectancy, as the patterns are broadly similar.

The data suggests that:

- **Northern Ireland (Decarbonising Maritime Transportation and SmartNanoNI).** Both projects based in Northern Ireland span geographies that include Belfast, which has very low female healthy life expectancy (falling within the lowest bin/bucket of the distribution). The projects also span some areas with higher healthy life expectancy, such as Newry, Mourne and Down (second highest bin/bucket).

- **South Wales (CS Connected and media.cymru).** Healthy female life expectancy at birth is relatively low in South Wales, compared to the rest of the UK. It is particularly low in Newport and regions to the north of Cardiff.

- **Scotland/Cumbria (Digital Dairy, The Living Laboratory and Smart Data Foundry.** The regions in which SIPF-funded projects are based in Scotland/Cumbria are mixed in terms of female healthy life expectancy. Edinburgh, where the lead partner for Smart Data Foundry (University of Edinburgh) is based, falls within the second highest bin/bucket, whereas Glasgow City (The Living Laboratory – led by the University of Glasgow) falls within the lowest. Digital Dairy covers a large area, which includes both regions with very low female healthy life expectancy, e.g. North and East Ayrshire, and very high female healthy life expectancy, e.g. Cumbria.

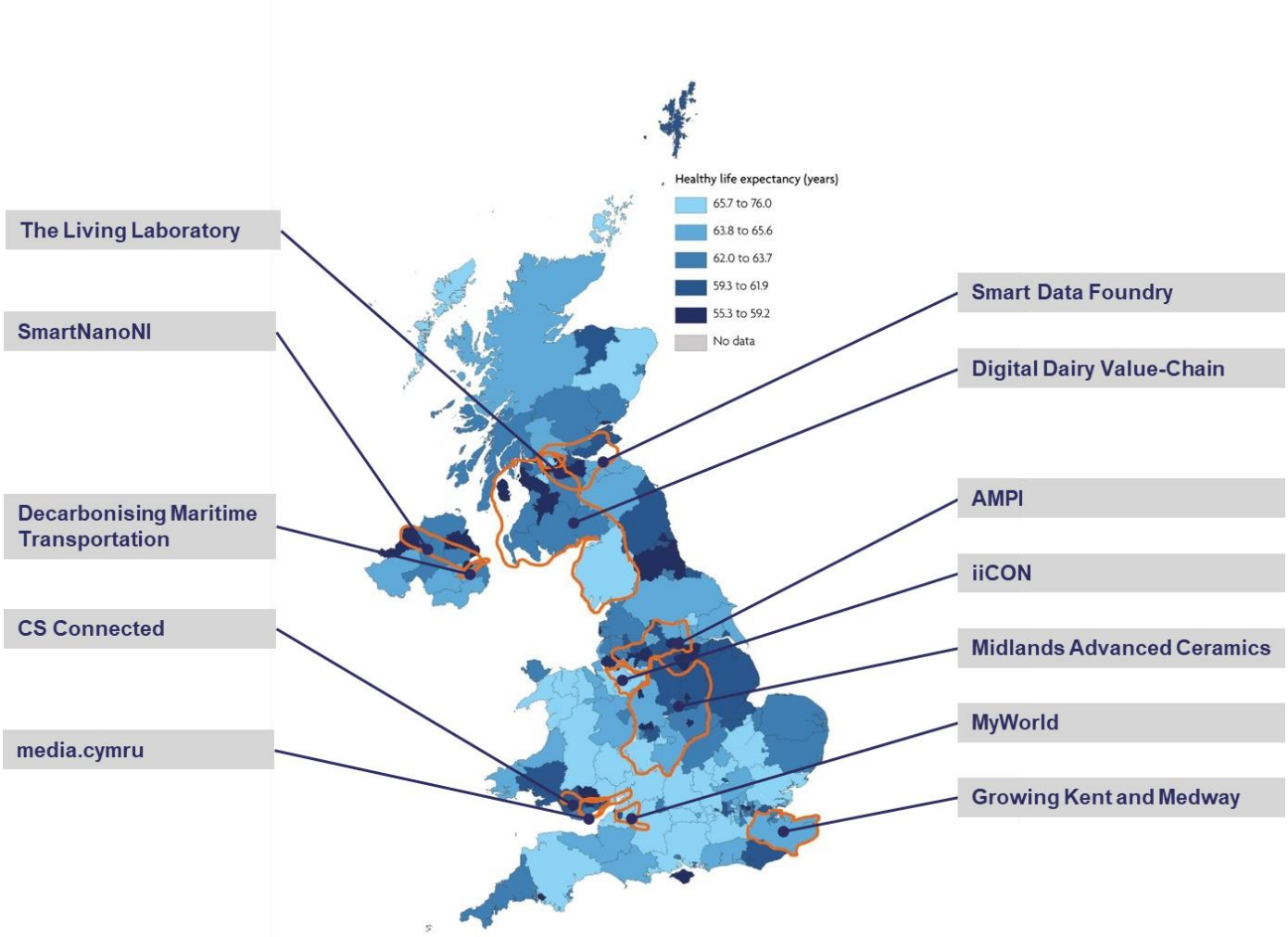
- **North West England/Yorkshire and the Humber (AMPI and iicon).** The areas covered by AMPI include some of the those with the lowest female healthy life expectancy in the UK, such as Wakefield. Liverpool, where the lead partner for iicon (Liverpool School of Tropical Medicine) is based, also has low female healthy life expectancy (falling within the lowest bin/bucket).

- **Midlands (Midlands Advanced Ceramics).** Midlands Advanced Ceramics covers a large geographical area which is very mixed in terms of female healthy life expectancy. In general, areas to the north-west of the geography (particularly cities such as Nottingham and Leicester) have lower healthy life expectancy, whereas more rural areas to the south-west (e.g. Worcestershire) have higher healthy life expectancy.

- **South West England (MyWorld).** The geography covered by MyWorld is mixed in terms of female healthy life expectancy. The City of Bristol has relatively low life expectancy, whereas the areas surrounding the city (e.g. South Gloucestershire and North Somerset) have relatively high life expectancy.

- **South East England (Growing Kent and Medway).** South East England has relatively high female healthy life expectancy, with most of the geography falling in the second highest bin/bucket of the distribution.

FIGURE 10 SIPF PROJECTS COMPARED WITH FEMALE HEALTHY LIFE EXPECTANCY AT BIRTH (2017-19)



Source: ONS (Health state life expectancy at birth and at age 65 years by local areas, UK)

3.6 POLICY DESIGN

3.6.1 EQ13: TO WHAT EXTENT HAS THE EVIDENCE BASE AROUND THE IMPACT OF LOCALLY TARGETED R&I SPENDING IN THE UK BEEN IMPROVED?

This question has been baselined drawing on three sources:

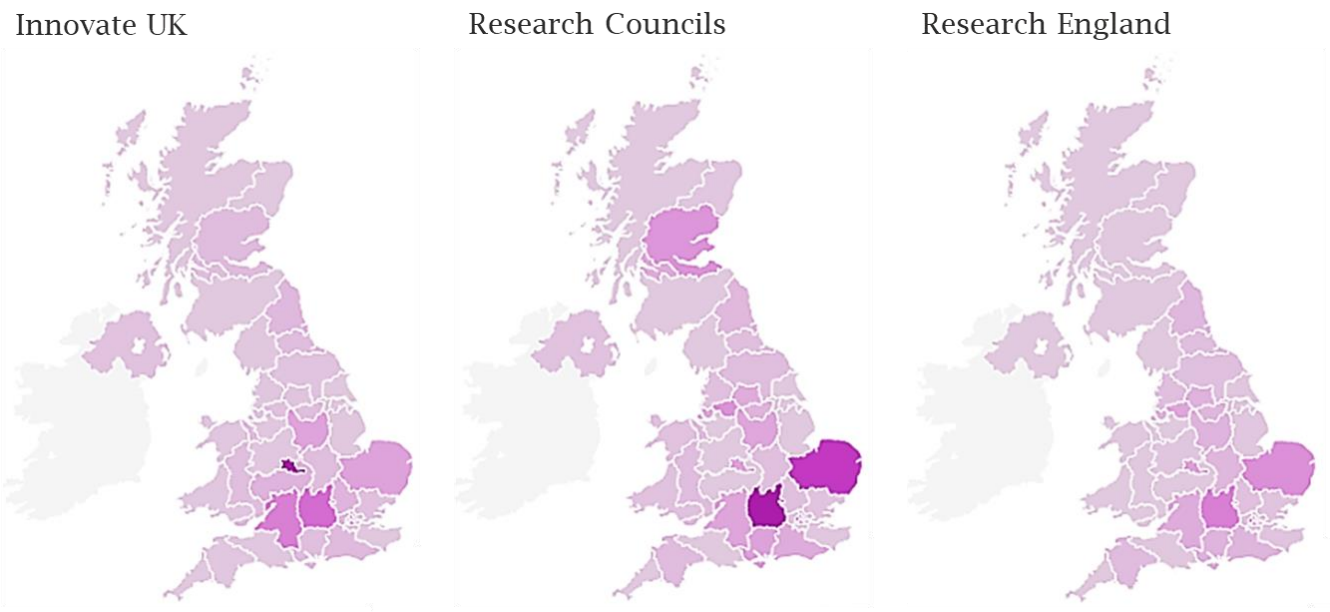
- Analysis of contextual data demonstrating patterns of previous non-SIPF UKRI investments.
- Geographical data from the Levelling Up White Paper.
- Qualitative insights from the policy expert interviews.

CONTEXTUAL DATA DEMONSTRATING PATTERNS OF UKRI INVESTMENT

This source provides contextual data for the geographic distribution (within the UK, where data is available) of UKRI investments at baseline. It does not, in itself, provide direct data relating to the evidence base around the impact of place-based investments such as SIPF. Instead, it informs thinking about whether SIPF is targeting different areas to 'standard' UKRI investments. If SIPF is indeed targeting different areas, this would suggest that the findings from the SIPF evaluations (project- and programme-level) will build on the evidence base around place-based policy.

Figure 11 shows the geographical distribution of total UKRI expenditure in 2019/2020 (covering Innovate UK (IUK), the Research Councils and Research England), by International Territorial Level (ITL) 2 regions. These bodies were responsible for 18%, 51% and 30% of UKRI spend in 2019/2020, respectively.

FIGURE 11 TOTAL UKRI EXPENDITURE IN 2019/2020 BY ITL2 REGION



Source: UKRI: https://public.tableau.com/app/profile/uk.research.and.innovation.ukri./viz/GeographicalDistributionofUKRISpendin2019-20and2020-21/UKRISpend

For IUK funding, the regions receiving the highest absolute levels of investment were West Midlands (£250m), Berkshire, Buckinghamshire and Oxfordshire (BBO) (£131m) and Gloucestershire, Wiltshire and Bristol/Bath (£106m). The data includes innovation grants, and funding which is spent on the national network of Catapult Centres.

For the Research Councils, the regions receiving the most grant funding in absolute terms were BBO (£529m), Inner London – West (£518m) and East Anglia (£425m). This data covers grants awarded to universities and research institutes, including research grants, training grants and fellowships, as well as additional spend on UKRI's institutes.

For Research England, the regions receiving the greatest absolute levels of funding were Inner London – West (£462m), BBO (£196m) and East Anglia (£156m) (very similar to the Research Councils). The Research England data comprises Quality Related Funding, the Higher Education Innovation Fund and competitive

funding streams. It does not include the UK Research Partnership Investment fund (UKRPIF), Enhancing Place-Based Partnerships (EPPE) or SIPF expenditure and does not cover Scotland, Wales or Northern Ireland.

The data suggests that **total innovation spending in 2019/2020 was dominated primarily by the West Midlands, BBO and areas of the South West of England (Gloucestershire and Bristol), whereas research funding was dominated by London and the South East**.

Scotland, Wales and Northern Ireland received relatively little innovation funding during the period. Eastern Scotland (which received the most in Scotland) received £25m, around a tenth of the funding received by the West Midlands. East Wales received £20m; Northern Ireland, £13m. **Scottish research funding was dominated by Eastern Scotland, which received the fifth highest level of total research expenditure (£168m)**. East Wales received £41m in total Research Council expenditure; Northern Ireland, £25m.

Examining per capita expenditure results in a similar pattern of investment. IUK funding was highest in the West Midlands (£85 per person), followed by BBO (£54 per person) and Inner London – West (£53 per person). IUK expenditure per capita was much lower in Scotland, Wales and Northern Ireland. Research Council funding per capita was highest in Inner London – West (£421), BBO (£218) and East Anglia (£168). Eastern Scotland and West Central Scotland ranked fourth and fifth respectively, whereas Wales and Northern Ireland received considerably less (NI received only £13 per person). For Research England, per capita spending is dominated by Inner London – West (£376).

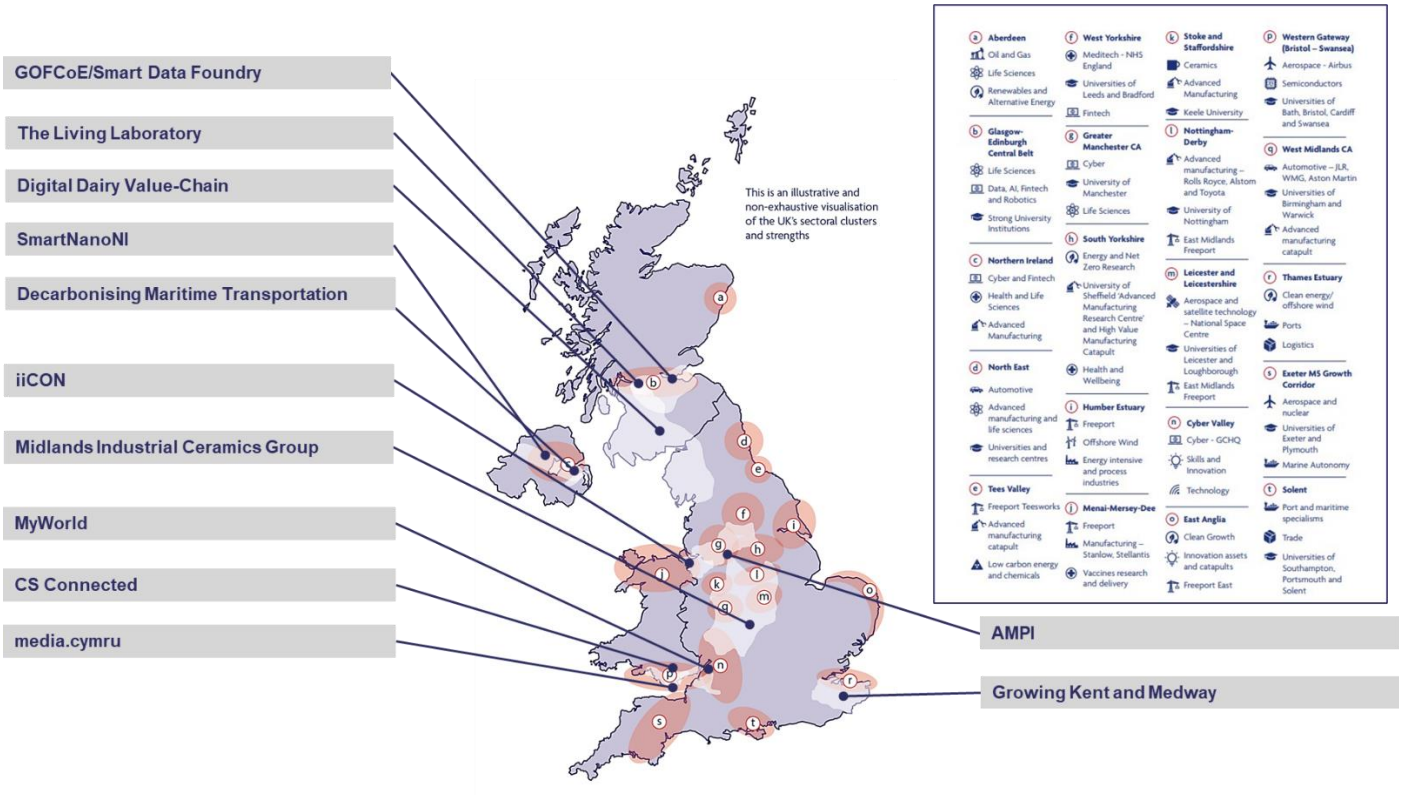
GEOGRAPHICAL DATA FROM THE LEVELLING UP WHITE PAPER

The Levelling Up White Paper includes an illustrative, non-exhaustive map of the UK's sectoral clusters and strengths, and highlights 20 locations identified as potential priorities for investment and for harnessing existing economic assets for levelling up. **Error! Reference source not found.** overlays the SIPF projects onto this map. As above, this does not, in itself, provide direct data relating to the evidence base around the impact of place-based investments. Instead, it informs thinking around whether SIPF is targeting funding to build on existing regional strengths. The map suggests:

- SIPF is building on known regional strengths in the Glasgow-Edinburgh Central Belt, as The Living Laboratory sits within Life Sciences and Smart Data Foundry sits within Data, AI, Fintech and Robotics.
- SIPF is building on existing capabilities in Advanced Manufacturing in Northern Ireland (SmartNanoNI and Decarbonising Maritime Transportation).
- In supporting iicon, SIPF is building on regional strengths in Vaccines Research and Delivery in Merseyside.
- In supporting AMPI, SIPF is building on capabilities in Advanced Manufacturing in the Midlands (Nottingham-Derby).
- SIPF is building on historic strengths in both Ceramics and Advanced Manufacturing in Stoke and Staffordshire (Midlands Advanced Ceramics).
- SIPF is building on known regional strengths in Semiconductors (CS Connected) in the Western Gateway (Bristol-Swansea). Creative industries are not listed as a strength of this area, although the map does include the Universities of Bath, Bristol, Cardiff and Swansea, which are all partners of MyWorld, media.cymru and/or CS Connected.

- Sectors related to Digital Dairy and Growing Kent and Medway are not highlighted in the Levelling Up White Paper. However, this map is illustrative and non-exhaustive, and does not appear to focus on agricultural/rural industries.

FIGURE 12 SIPF PROJECTS COMPARED WITH ILLUSTRATIVE MAP OF THE UK'S SECTORAL CLUSTERS AND STRENGTHS



Source: Levelling Up White Paper
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1052708/Levelling_up_the_UK_white_paper.pdf

QUALITATIVE INSIGHTS FROM POLICY EXPERT INTERVIEWS

In general, interviewees characterised the knowledge base as '**incomplete**', which echoes the findings of our Rapid Evidence Review in the Evaluation Framework Report (see Section 2). An interviewee from the UK government stated that: 'fundamentally, we don't have a comprehension of the real impact of place-based vs excellence based funding criteria'. They added that a benefit of SIPF is that it is testing the effectiveness of a combined approach of funding universities and businesses together. Another UK government interviewee suggested that the biggest gap in the knowledge base was around absorptive capacity within specific places – it is widely agreed that this is in issue in R&D policy-making but there is very little evidence to support this assertion.

However, our interviews suggested that **evidence on place-based R&D is being produced/used by the UK and Devolved governments** to inform policy-making. For example, we were told that the Northern Irish

government published the '10X Economy' report[31], which outlined its economic vision for a 'decade of innovation'. Our interviewee explained that this report recognised the huge disparities in R&D investment in Northern Ireland: there is a lot of activity in Belfast and other bigger areas (e.g. Mid Ulster), but large areas of 'nothing whatsoever'. These R&D disparities correspond to disparities in other economic activity and wealth.

Interviewees from the Welsh government provided insights on how they have considered place when viewing the landscape of funding in Wales. They described the Welsh government analysis (led by Graeme Reid, University College London) that showed the dominance of organisations in Cardiff and Swansea in terms of receiving research grants.

A UK government interviewee provided examples of **evidence that is being drawn on for policy-making**. First, Cambridge Econometrics produced a report for BEIS in 2020 that assessed the potential future impacts of increasing the ratio of R&D expenditure to GDP to 2.4% by 2027 (a current target). As part of this research, the authors explored different weightings of R&D expenditure between the South East ('Golden Triangle') and other parts of the country.[32] Second, the interviewee also highlighted another report produced by the National Institute of Economics and Social Research (NIESR) for BEIS in 2021[33], which found that R&D investment has stronger effects when considering the most advanced and radical type of innovations, but only in those regions that are the most R&D-intensive and more specialised in high-tech industries. In contrast, the effect of R&D investment in more gradual and incremental types of innovations appears to be more evenly distributed across regions and industries in the UK.

Interviewees also described the **experts they work with or whose evidence they use** to inform policy-making in this area. Organisations included:

- Universities and colleges. Particular academics highlighted by interviewees include Prof Philip McCann (University of Sheffield), Tomas Ulrichsen (University of Cambridge), Dr Anna Valero (London School of Economics), Prof Graeme Reid (University College London) and Prof John van Reenen (London School of Economics).
- Not-for-profit organisations, e.g. NESTA, Royal Society for Arts, Manufacturers and Commerce (RSA), Campaign for Science and Engineering
- Innovation agencies, e.g. IUK, Scottish Enterprise, and related bodies such as the Innovation Caucus.
- Other public bodies, e.g. Scottish Cities Alliance, Innovation Advisory Council for Wales
- Research Organisations, e.g. Productivity Institute, Bennett Institute for Public Policy, Brookings Institution

[31] https://www.economy-ni.gov.uk/articles/10x-economy-economic-vision

[32] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897462/macroeconomic-modelling-of-2-4-r-and-d-target.pdf

[33] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1023591/niesr-report.pdf

3.6.2 EQ14: DID THE LEARNINGS FROM SIPF INFLUENCE AND IMPROVE THE DESIGN OF R&I POLICY?

This question has been baselined based on the policy interviews. While EQ14 is largely not relevant for baselining in that it is inherently about the *impact* of SIPF and the difference it makes, interviewees expressed some early views on SIPF which we summarise here. Further exploration of these issues will be conducted as part of the impact evaluation and, where relevant, in the process evaluation (e.g. where views on the delivery process and mechanism were expressed).

In terms of **SIPF's influence on policy-making**, one interviewee stated that 'at a policy level, the Northern Irish government views [policies like] SIPF as something that should be happening a lot more, [and the] thinking that underpins SIPF should be endemic across funding steams'. In addition, they suggested there may be additional spillover effects from the SIPF programme. For example, the Northern Irish government is currently exploring funding one of the local projects that was above the SIPF quality threshold but that missed out on SIPF funding. An interviewee from the Scottish Funding Council (SFC) described SIPF as a 'shining example of place-based policy in action'.

Another interviewee stated that the view from the Levelling Up Task Force is that SIPF has been a 'promising experiment in place-based R&D'. However, there is a feeling that it has focused on university research rather than later-stage R&D. The interviewee explained that SIPF is 'top-down' in that it is a centralised, one-way fund for which there are repeated rounds of national competition. An alternative to this model could be to incorporate some local and regional structure, which has the flexibility to invest in what is important for that particular area. Ideally, this would have representation from national funders and partners, and local experts and delivery bodies.

It is important to note that interviewees from both Scotland and Wales highlighted the **difficulties in viewing the devolved nations as 'places'**. For example, one interviewee stated that 'if a place is viewed too broadly, then you end up with no benefit. Viewing Scotland as a place vs the UK as a place is not that different [in terms of considering where its assets are located]'. Another stated that 'when Wales is called a region rather than a country, it can feel as if the box is ticked [when funding is awarded to South Wales] … North Wales feels very left behind'.

In terms of the **overall culture of R&D policy-making**, one interviewee stated that there is currently an 'extremely strong' culture of making funding decisions based purely on excellence, and that this 'requires proactive challenge to change'. They did, however, highlight that there has already been change in the last five years, for example, with the implementation of the network of IUK representatives with specific geographical responsibilities.

This sentiment was echoed by a UK government interviewee who suggested that there is no longer seen to be a stark trade-off between excellence and place, and that this has changed in the last two years (since 2019). For example, Sir Patrick Vallance (Chief Scientific Advisor to the UK government) has spoken out on the possibility of R&D contributing to local economic benefit, as well as keeping the UK a science superpower.[34]

[34] https://www.gov.uk/government/publications/the-contribution-of-science-and-technology-for-levelling-up-across-the-uk

HEFCW interviewees explained that 'place' is one of four thematic pillars that constitutes its Vision for R&I, which was published in 2019. The Welsh government has generally been moving towards a regional, place-based approach for a number of years. For example, it has defined three regions of Wales (South East, Mid and South-West, and North), and each has a regional economic framework and a Chief Regional Officer.

Although it was generally seen as limited, our interviews provided specific examples of place-based policy currently or recently being used in the UK. Place-based investments mentioned by the interviewees included:

- City and Region Deals (Northern Ireland, Scotland)/City and Growth Deals (Wales)
- A new Artificial Intelligence Collaboration Centre (over £18m of investment), where subregional impact is 'written into the rationale and operating model' (Northern Ireland)
- European Structural funds (pre-Brexit)
- Community Renewal Funds (post-Brexit, and in preparation for the UK Shared Prosperity Fund)[35]
- Levelling Up Fund[36]
- Horizon Europe (many 'Missions' call for a place-based approach)
- Cluster-focused Research and Development Allowances (RDAs)

Referring to the City and Region Deals in Scotland, an interviewee from the SFC described them as 'immensely interesting in the ways universities, local authorities [and] economic development agencies have come together to plan uses of large amounts of money'. They gave the examples of the Data Driven Innovation (DDI) initiative in Edinburgh and agriculture research being performed in Sterling, both of which build on expertise already present in these regions. The interviewee suggested that the City and Region Deals have benefited from a similarly broad definition of economic geography to SIPF, i.e. self-identified regions that are not rigid to local authority boundaries.

3.7 VALUE FOR MONEY

3.7.1 EQ15: TO WHAT EXTENT DOES THE SIPF REPRESENT VALUE FOR MONEY GIVEN THE OVERALL IMPACT ON KNOWLEDGE, ECONOMY AND SOCIETY RELATIVE TO THE SIZE OF THE INVESTMENT?

This evaluation question has not been baselined separately. Evaluation of this question will reflect all evidence and metrics gathered for the evaluation.

3.8 SUMMARY OF WAVE 1 PROJECT BASELINING ACTIVITIES

As part of our interviews with Wave 1 projects, we gathered information on the baseline activities performed to-date (as of September 2021). A summary of the findings is reported in Table 25. At the time

[35] https://www.gov.uk/government/publications/uk-community-renewal-fund-prospectus/uk-community-renewal-fund-prospectus-2021-22

[36] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/966138/Levelling_Up_prospectus.pdf

of our interviews with Wave 2 projects (April 2022), they were in the very early stages of planning project-level evaluations (e.g. establishing KPIs, considering methodologies, appointing external evaluators) and were therefore not yet in a position to comment on baselining activities.

TABLE 25 SUMMARY OF WAVE 1 PROJECT BASELINING ACTIVITIES

PROJECT	BASELINING ACTIVITIES DISCUSSED IN INTERVIEWS
Decarbonising Maritime Transportation	■ Decarbonising Maritime Transportation submitted baseline statistics as part of the SIPF proposal but has not updated them since. ■ Baseline variables in the proposal include levels of pollution and passenger transportation, which have been substantially affected by the Covid-19 pandemic and therefore need to be updated. ■ They are currently tracking a number of KPIs, including dissemination activities, presentations, academic publications, apprenticeship schemes and number of patents. ■ They also monitor follow-on funding (e.g. Queen's University Belfast project on storage of hydrogen; Clean Maritime Demonstration Competition) and spinouts (e.g. those looking at cold ironing and shore power). ■ In the longer term, Decarbonising Maritime Transportation plans to measure commercial revenue and employment associated with the project
CS Connected	■ Produced a monitoring and evaluation plan which outlines the data relating to project performance the project will collect. ■ Some KPIs (e.g. grants data, publications, CS-related entities in region) will be possible to 'back-date' to pre-SIPF award and analyse by year of achievement. They are currently considering how far back to collate this data – probably to 2015. ■ SIPF seedcorn funding supported a baseline economic analysis of the cluster in 2019, which was influential in setting out the opportunity and economic potential of the compound semiconductor sector across a range of investments, and informed metrics and KPIs included in the full SIPF bid in Sept 2019.[37] ■ A third report will be published at the end of FY 2021. As part of this report, they are aiming to develop a dashboard showing how the cluster connects to the wider Welsh economy. ■ A range of around 5-6 contextual case studies are on-going to illustrate the evolution of the cluster in 2012-21 period, and with this also serving as an extended baseline through which to understand the value of CS Connected work in the period 2020-2024.

[37] https://csconnected.com/media/vdsn3fgo/csconnected-annual-report-2021.pdf

PROJECT	BASELINING ACTIVITIES DISCUSSED IN INTERVIEWS
	■ No further baselining is planned. The project already has good data on the main industrial players and data going back seven years on employment and GVA in the sector.
Smart Data Foundry	■ Baseline research has been conducted across the various propositions, including: ■ Interviews conducted with approx. 20 fintech companies exploring unmet needs around (open finance) data-driven product and service development, testing and proving out concepts and propositions. ■ Competitor analysis and landscaping around continued professional development, executive education and training provided by online learning platforms, exploring areas across data privacy and governance, cybercrime, customer data protection, data-driven innovation, data engineering) and identified gaps. ■ Fintech and Financial Services Research and Innovation Roadmap, in collaboration with Fintech Scotland and Whitecap Consulting. ■ Poverty Premium research to validate scale and impact of poverty premium on UK households and individuals.
Growing Kent and Medway	■ Baselining was done during the application phase, including comparisons with other regions, regional expenditure on R&D and the research excellence of project partners.
iicon	■ Quantitative baselining evidence collected (starting summer 2021): ■ Identifying datasets that are available in baseline years. One example is Global Data, which is focussed on relevant diseases (e.g. tuberculosis, malaria, Covid, influenza) and subject areas (e.g. antimicrobial resistance, vector control), and regulatory steps to bring products further along technology readiness levels. ■ In these datasets, iicon tried to narrow down to UK-level data and, where possible, North-West England-level data (this is challenging). They found 166 companies in the region in Global Data. ■ Also tracking research KPIs such as academic publications, policy/guidelines influenced and meetings attended. ■ Qualitative baselining evidence collected: ■ Conducted a series of interviews with key stakeholders in the sector, from academia, industry and government. These included international experts as well as those based in the NW region, and were identified using 'Chained Referral'. ■ Interviews were aimed at exploring strengths and perceived limitations of iicon. They also gained perspectives on lessons learned from the Covid-19 pandemic and the UK's preparedness for another outbreak.
MyWorld	■ Currently scoping baselining work.

PROJECT	BASELINING ACTIVITIES DISCUSSED IN INTERVIEWS
The Living Lab	■ Baselining work for the SIPF application was based on the BEIS Science and Innovation Audits.[38] ■ In baselining the project, it will be important to consider how to incorporate or adjust for the 'Lighthouse Laboratory' facility (the UK's largest Covid-19 testing centre) that grew out of a partnership that originated as part of the SIPF proposal.

Source: Frontier Economics, RAND Europe and know.consulting

3.9 USE OF COUNTERFACTUALS

In the Evaluation Framework Report (see Section 6.1), we explain that a range of counterfactual approaches will be required for the impact evaluation. To understand the feasibility of the various approaches, as part of our baselining interviews with SIPF-funded projects, we asked each of the project representatives for suggested sector-region combinations that could act as counterfactuals for their projects. A summary of the findings, structured by project, is available in Annex F.

Overall, the projects emphasised the uniqueness of the SIPF investments and therefore the challenges associated with identifying appropriate comparators in terms of both sectors and regions. Some projects suggested particular *regions* that may be comparable but also highlighted key differences in the *sectors* that operate in those regions. Some project also suggested historical or international comparators, which are unlikely to be feasible in terms of data availability. For these reasons, we conclude that **it will not be possible to systematically identify counterfactuals for each project in the secondary data sources**.

However, it is likely that we will be able to use the information obtained from projects as part of the planned case studies for the impact evaluation. We will **explore engaging with stakeholders from suggested sector-regions in order to perform a qualitative comparison**. This more nuanced approach will ensure that the differences between the project sector-regions and the comparators are recognised. In addition, the information obtained from the projects may be helpful in informing the project-level evaluations.

[38] https://www.gov.uk/government/collections/science-and-innovation-audits

4 CONCLUSIONS

This report aims to build a picture of the 'state of the world' before, or in the early stages of, the SIPF programme. We combine quantitative and qualitative sources to summarise the baseline position for all evaluation questions and indicators for which data is available. These will provide points of comparison for the Fund-level impact evaluation being conducted through later phases of the evaluation between 2023 and 2026.

A relatively small number of quantitative secondary data sources were available at a suitable level of disaggregation for baselining the SIPF projects. Examples of indicators for which we found this type of detailed data include academic R&I spending (from HESA Finance Data) and numbers of apprenticeships. By contrast, some datasets provide only broad regional/sectoral trends, although this is helpful information for contextualising the primary data that will be produced by projects. For example, BERD data shows sectoral trends in commercial R&I spending and employment.

It is not possible to baseline all indicators quantitatively. In some cases (e.g. adoption of innovations, technology or knowledge created by SIPF investments) this reflects the indicators referring explicitly to the outputs of SIPF, and therefore zero being an appropriate baseline. In other cases (e.g. regional trade impacts and impacts on health, wellbeing and the environment) our detailed data review concluded that there is no sufficiently robust and granular quantitative data, and therefore qualitative and project-specific evidence will be relied on for the Fund-wide evaluation.

We obtained a large amount of rich information from qualitative engagement through the interviews and email consultation. A key challenge in producing the Baseline Report has been summarising the information received, given the diverse nature of the funded projects.

From the interviews, we found that Policy stakeholders are generally positive about SIPF as an experiment in place-based policy-making, as the knowledge base in this area is generally considered incomplete. A challenge for future phases of evaluation will be teasing out the role of SIPF in influencing R&I policy, given that our evidence suggests that the culture has already changed rapidly towards more regional-focused growth (most obviously as part of the Levelling Up agenda) and that there are a range of other place-based R&I initiatives being delivered, albeit not at the same scale as SIPF.

ANNEX A. EVALUATION OF SECONDARY QUANTITATIVE DATA SOURCES

As part of the baselining phase, we conducted a detailed review of available quantitative secondary data sources. Table 26 below sets out the full list of secondary quantitative data sources evaluated and a summary of our assessment regarding their usefulness for the SIPF evaluation. The data sources are arranged in the table according to the themes that the data covers, although some data sources span multiple themes.

TABLE 26 ASSESSMENT OF SECONDARY DATA SOURCES

	Data Source	Description	Relevant EQs and indicators	Assessment	Included in baseline?
Research outputs	KEF/REF returns	The Research Excellence Framework (REF) / Knowledge Exchange Framework (KEF) are a system for assessing the quality of research in UK higher education institutions. A searchable database and an initial analysis of REF/KEF impact case studies are available online. The dataset covers 154 UK universities. Publication of data occurs only every 6-7 years, with the most recent editions from 2014.	EQ1, Indicator 1	In terms of sectoral disaggregation, the dataset is only split by 36 subject based Units of Assessment. The submissions do not provide a complete record of all research conducted in UK higher education institutions. Only publicly funded institutions are eligible to make submissions. Due to the infrequency of publication and limited sectoral disaggregation, the data has limited use for evaluation above Dimensions.AI data.	No
	Complete University Guide Rankings	Independent UK university rankings, split by 74 subject areas. Includes scores for research quality and graduate prospects.	EQ10, Indicator 1	Only available for current or prospective academic year. The ranking methodology is not fully transparent and we understand that rankings can be particularly unstable year to year. Of limited use for evaluation beyond Dimensions.AI and HESA data.	No
	Dimensions.AI	Dimensions.AI is a searchable database of measures of academic impact including grants, patents, clinical trials, publications and citation. We note that UKRI has a subscription, which allows searches of more types of publication, as well as export of data.	EQ1, Indicator 1, Indicator 3 EQ9, Indicator 1	Provides helpful metrics on research outputs. These include publications, citations, co-authorship with industry, and information on grants. The data is split by over 150 fields of research. Data is updated continuously but last 6-12 months of journal publications are often incomplete.	Yes

R&I funding (Academic)	Gateway to Research	Gateway to Research is an openly available search portal developed by UKRI. It allows a search of publicly funded research and innovation with specific terms.	EQ1, Indicator 3	Includes information on field, timeline, award amount, organisation, and a brief project summary. Completeness of data is variable and also differs between the research councils and over time. Outcomes data is particularly patchy. May not provide much additional value over ResearchFish returns by SIPF projects.	No
	HE Finance Data (HESA)	The Higher Education Statistics Agency (HESA) publishes data on the finances for individual higher education institutes in the UK. This covers the income and expenditure of higher education providers in the UK, as well as other financial statements covering balance sheets, cash flow and capital expenditure.	EQ1, Indicator 2	Provides helpful information on research grants and contract income by HESA cost centre and institution. Data is available from 2015/16 to 2019/20. HESA cost centres are quite broad definitions of subject/sector and is not an ideal level of disaggregation for identifying projects. However, data still useful in showing broad trends for the HE provider partners of each project.	Yes
R&D funding (Commercial)	BERD	The Business Enterprise Research and Development (BERD) time series is published by the ONS and is publicly available up to 2019. The BERD contains total value of business spending on R&D.	EQ2, Indicator 2	Due to the relatively small sample size of the survey (~5,400 businesses), it is not possible to split data reliably by both region and sector simultaneously. However, the publicly available data is still helpful in providing broad trends for sectoral expenditure and employment in R&D.	Yes
	UKIS	The UK Innovation Survey (UKIS) is administered by the ONS and collects data on the innovation activities of businesses. The headline findings and some statistical annexes covering high-level R&D statistics are made publicly available.	EQ2, Indicator 2	The publicly available headline statistics and statistical annexes provide very limited information of use for evaluation. While it is possible to access the underlying microdata for the survey through the secure research service, the limited sample size of the survey (~32,000 businesses) means that it is not possible to reliably disaggregate the data by both industry and region simultaneously to a sufficient level. Unlikely to provide substantial additional value for evaluation over BERD data.	No

Intellectual property	Orbis IP	Commercial database provided by Bureau van Dijk (BVD). Combines BVD's FAME database, which covers private company information for UK and Ireland and global patent data. Includes a cumulative measure of the number of patents filed, together with a valuation of each patent. Includes financial data where this is available.	EQ2, Indicator 1	Potentially useful data on patent valuation but with a significant cost (~£12,000 per year). We also understand there may be some data quality issues with not all patents having a recorded valuation and potentially substantial lags before new patents are added. May not provide significant additional value over HESA HE-BCI data and ResearchFish returns by SIPF projects.	No
	CrunchBase	CrunchBase contains information on companies. It is a crowdsourced platform, with over 675,000 firms in the database (worldwide). Crunchbase organises companies into 700+ Industries and 40+ Industry Groups. Company profiles can belong to multiple industries and industry groups. Data on trademarks and patents is also available for firms within their database. It also contains data on private investment, including funding status, number of funding rounds, and total funding.	EQ2, Indicator 1 EQ2, Indicator 3	Some potentially helpful data on private investment, trademarks and patents granted (but not patents filed). Cost of around £600 per year. Patchy coverage of employment and revenues. Unlikely to provide additional value over HESA HE-BCI data and ResearchFish returns by SIPF projects.	No
	PATSTAT	EPO's commercial PATSTAT database contains bibliographical data related to over 100 million patent documents.	EQ2, Indicator 1	Published biannually but with a very significant time lag (2-3 years). Not straightforward to disaggregate by region. Unlikely to provide much additional value over HESA HE-BCI data and ResearchFish returns by SIPF projects.	No
Spin-offs	HE-BCI (HESA)	HESA publishes data on the Business and Community Interaction of higher education providers in the UK. This covers a broad range of topics, is published annually, and is made openly available to download. Examples of the range of topics covered by this data include: income from collaborative research involving public funding, CPD courses for business and the community, IP licence numbers and disclosures, IP income, IP	EQ2, Indicator 1 EQ3, Indicator 2 EQ9, Indicator 1	Provides helpful data on employment and turnover of spin-offs for HE providers. Also provides information on patents filed, patent income and CPD courses. The data is not split by subject but provides some broad trends in spin-off and patent activity for the HE provider partners of each project.	Yes

		spin-off activities and community engagement.			
	Beauhurst	Beauhurst is a commercial database which covers all UK incorporated companies. There is an additional level of data for companies which meet one of Beauhurst's triggers to be identified as 'high-growth'. Includes information on investment and the associated investors, grants, IP and employees.	EQ2, Indicator 1 EQ2, Indicator 3 EQ3, Indicator 2	The dataset includes around 30k tracked high-growth companies. Would not necessarily capture spin-offs related to SIPF unless they achieve the requirements to be flagged as high-growth. The data is orientated around a snapshot of the 'current' data, with limited ability to compare data over time. Unlikely to provide sufficient additional value for the evaluation to justify the cost.	No
	Glass.AI	Glass.AI is a commercial source that enables keyword searches of business websites, news, social media and official sources.	EQ4, Indicator 1 Indicator 2 EQ3, Indicator 2 EQ10, indicator 2 EQ14, indicator 1	Analysis would be bespoke, iterating and refining keyword searches to use. Potentially useful for a number of EQs but at a high cost and a different approach would be needed for each EQ (leading to further costs).	No
	ONS: Business – Activity, Size and Location	Publicly available ONS data also taken as a snapshot of the Inter-Departmental Business Register (IDBR) provides high-level statistics on numbers of businesses. The 2020 edition of the "Business Demography" Dataset is the latest release and contains 28 summary tables.	EQ3, Indicator 2	The level of disaggregation in the data is not sufficient to be useful for the evaluation. The BSD (available via the secure research service) covers similar data at a finer granularity and is likely more useful for the evaluation.	No
Jobs and skills	ASHE	The Annual Survey of Hours and Earnings (ASHE) is a survey of employees in the UK, covering approximately 140,000 to 185,000 individuals per year. It tracks the same individuals per year, and therefore it is possible to construct a panel dataset. Data on the wages, paid hours of work, pensions arrangements, age, occupation and industrial classification are available.	EQ5, Indicator 1	Provides helpful data on median weekly earnings by region and sector of employment. Publicly available at local authority district level. More granular disaggregation by both region and sector requires secure access permission.	Yes

	HE Student Data (HESA)	The Higher Education Statistics Agency (HESA) publishes data on student enrolments for higher education providers in the UK. Contains high-level breakdowns of some personal characteristics.	EQ6, Indicator 1	Cannot be used to identify continuing professional development courses or apprenticeships and therefore of very limited use for the evaluation.	No
	Apprenticeships and Traineeships data – UK government	UK government data on apprenticeship numbers by region and subject area.	EQ6, Indicator 1	Region is disaggregated at LAD level and sectors are SSAT2 groups (or equivalent for Wales, Scotland and Northern Ireland). Provides helpful broad regional and sectoral trends in apprenticeship numbers.	Yes
Economic impact	BSD	The Business Structure Database (BSD) contains a handful of variables for almost all business organisations in the UK. It is a snapshot of the Inter-Departmental Business Register. For each company, information available includes employment, turnover, foreign ownership, and industrial activity, year of birth, and year of death.	EQ3, Indicator 2 EQ5, Indicator 1 EQ7, Indicator 2	Fine granularity data potentially allowing mapping to individual projects. Data published annually, beginning 1997. The data does not include the financial information required for calculating GVA and requires secure access permission.	Yes
	ONS GVA	The Office for National Statistics (ONS) publishes GVA estimates by industry, city and enterprise region. These high-level statistics are publicly available as a time series on the ONS website.	EQ7, Indicator 1	Publicly available statistics on GVA from the ABS. Industrial disaggregation is only to two digit SIC code, making it of limited use for the evaluation.	No
	ABS	The Annual Business Survey (ABS) is a structural business survey conducted by the ONS. It collects financial data from businesses' end-of-year accounts which include turnover, wages, salaries and capital expenditure. It covers most sectors of the economy.	EQ7, Indicator 1, Indicator 2	The survey has a sample size of approximately 62,000 businesses (census of larger firms, 250+ employees, and a random stratified sample of smaller firms). It provides helpful GVA data. Survey size does not give sufficient granularity to identify projects. May be combined with BSD data to proxy GVA impacts for individual projects. Requires secure access permission.	Yes

	HMRC Trade Data	HMRC publishes data used in regional trade statistics (RTS). Data is taken primarily from Customs systems (for non-EU trade) and the Intrastat survey (for EU trade). HMRC does not receive information in respect of goods that move wholly within the UK, nor in intangibles and services such as banking or tourism. Currently these statistics are labelled as experimental.	EQ7, Indicator 3	Data only represents international trade in goods, not services. It therefore would not capture the service activities of the SIPF projects. The dataset also has very limited sectoral and regional disaggregation.	No
	FAME	A commercial dataset produced by BVD. It is derived from scraping and cleaning Companies House data. It includes all financials available in company accounts.	EQ3, Indicator 2 EQ7, Indicator 1	Rich financial data and good disaggregation but high cost and limited coverage of small firms. Unlikely to provide significant value for the evaluation beyond ABS and BSD data.	No
Societal impact	JRF Inclusive Growth Monitor	The Joseph Rowntree Foundation and University of Manchester produce an Inclusive Growth Monitor. This compiles statistics for England at the local enterprise partnership level (similar to county level). These statistics cover employment, productivity, skills, benefits, rent, poverty and inequality.	EQ11, Indicator 1	Useful metrics on inclusive growth, poverty and inequality. Unfortunately, appears to have been discontinued. Data only available for 2010 to 2015.	No
	ONS Gender pay gap statistics	The ONS publishes annual gender pay gap estimates for UK employees by age, occupation, industry, full-time and part-time, region and other geographies, and public and private sector. Compiled from the Annual Survey of Hours and Earnings.	EQ11, Indicator 1	Level of disaggregation is limited. Very unlikely to observe any impacts of SIPF at this level.	No

Source: Frontier Economics, RAND, know.consulting

ANNEX B. DETAILS OF PAST INVESTMENT IN SIPF PROJECTS

In July 2022, projects were asked by the SIPF Delivery Team to provide information on historic and related grants, funds or investment that were 'significant' in allowing them to successfully obtain SIPF funding. This data is useful for the Fund-wide evaluation as it will help us to isolate the effect of SIPF funding versus other funding sources.

The 12 projects cited a total of 64 grants, funds or investments as being significant to their ability to successfully apply to SIPF. The total value of these grants was approximately £325m, where the range of grants cited was between £25,000 and £30m.

The sources of grant funding and investments included Research Councils, charities, government bodies, national governments and assemblies, and City/Growth Deals. Five projects noted the importance of the SIPF Seedcorn Stage funding as crucial to developing their application and consortium.

The remainder of the findings can be summarised as follows:

- The most frequently cited funders were:
  - Engineering and Physical Sciences Research Council (EPSRC) (13 grants)
  - Research England (13 grants)
  - Arts and Humanities Research Council (AHRC) (7 grants)
  - The Scottish Government and Scottish Enterprise (5 grants)
  - Innovate UK (5 grants)
- The most frequently cited funding schemes were:
  - UK Research and Investment partnerships (UKRPIF) (5 grants)
  - Strength in Places Seedcorn funding (5 grants)
  - EPSRC Centres for Doctoral Training (3 grants)
  - AHRC Creative Industries Cluster Programme (3 grants)
- Reasons given for the significance of historic and related grant funding for developing a SIPF application include:
  - Establishing or expanding facilities and resources
  - Building partnerships and new consortia
  - Piloting new approaches and testing processes
  - R&D

TABLE 27 FULL LIST OF SIGNIFICANT HISTORIC/RELATED FUNDING BY PROJECT

PROJECT	FUNDER	UKRI/ NOT UKRI	NAME OF FUNDING CALL	AMOUNT (£000S)	FUND TYPE	TYPE OF IMPACT
AMPI	EPSRC	UKRI	EPSRC Future Manufacturing Hub	10,462	EPSRC Future Manufacturing Hub	Facilities
AMPI	EPSRC	UKRI	Future Metrology Hub	10,306	EPSRC Future Metrology Hub	Facilities

PROJECT	FUNDER	UKRI/ NOT UKRI	NAME OF FUNDING CALL	AMOUNT (£000S)	FUND TYPE	TYPE OF IMPACT
AMPI	EPSRC	UKRI	Programme Call	7,932	EPSRC Programme Grant	R&D
AMPI	EPSRC	UKRI	"Pipebots" research project	7,291	EPSRC Programme Grant	R&D
AMPI	EPSRC	UKRI	Centre for Innovative Manufacturing in Composites CIMCOM	5,900	EPSRC Programme Grant	R&D
AMPI	EPSRC	UKRI	UKRIC Leeds - robotics in infrastructure	10,000	UK Collaboratorium for Research on Infrastructure and Cities	Facilities
CS Connected	EPSRC	UKRI	Centre for Doctoral Training	6,589	EPSRC Centre for Doctoral Training	Facilities
CS Connected	EPSRC	UKRI	Future Compound Semiconductor Manufacturing Hub	10,330	EPSRC Future Manufacturing Hub	Facilities
CS Connected	ERDF via Welsh Government	Not UKRI	ERDF SO1.2	13,147	ERDF	Partners and consortium building activity
CS Connected	ERDF via Welsh Government	Not UKRI	ERDF SO1.2	3,200	ERDF	Piloting Approaches
CS Connected	Research England	UKRI	UK Research Partnerships Investment Fund	30,000	UK Research Partnerships Investment Fund	Piloting Approaches
CS Connected	Research England	UKRI	UK Research Partnerships Investment Fund	17,300	UK Research Partnerships Investment Fund	Piloting Approaches
Decarbonising Maritime Transportation	Research England	UKRI	Strength in Places Fund Seedcorn Stage	50	Partners and consortium building	R&D
Digital Dairy	UK and Scottish Government	Not UKRI	Borderlands Inclusive Growth Deal - Dairy Nexus	8,000	City or Growth Deal	Facilities
Digital Dairy	Innovate UK & Novosound	UKRI	Knowledge Transfer Partnership	180	Innovate UK funding	Partners and consortium building activity
Digital Dairy	Innovate UK & Novosound	UKRI	Transforming Food Production	172	Innovate UK funding	Piloting Approaches
Digital Dairy	Scottish Enterprise	Not UKRI	IOT Cyber Challenge Programme	150	Scottish Government	Facilities
Digital Dairy	Scottish Government	Not UKRI	Scotland 5G	5,300	Scottish Government	Partners and consortium building activity
Digital Dairy	Research England	UKRI	Strength in Places Fund Seedcorn Stage	50	Strength in Places	Partners and consortium building activity

PROJECT	FUNDER	UKRI/ NOT UKRI	NAME OF FUNDING CALL	AMOUNT (£000S)	FUND TYPE	TYPE OF IMPACT
Growing Kent and Medway	SALEP Local growth Fund	Not UKRI	East Malling Advanced Technology Horticultural Zone	1,750	City or Growth Deal	Facilities
Growing Kent and Medway	BBSRC	UKRI	GCRF	4,900	GCRF	R&D
Growing Kent and Medway	Research England	UKRI	Expanding Excellence in England FaNSI	8,080	Research England Expanding Excellence in England	Facilities
Growing Kent and Medway	Research England	UKRI	Strength in Places Fund Seedcorn Stage	50	Strength in Places	Partners and consortium building activity
iicon	Against Malaria Foundation	Not UKRI	RCT Uganda (LLINUP)	5,000	Against Malaria Foundation	Piloting Approaches
iicon	Crowd Funded	Not UKRI	Swab and send (ongoing)	£30 a sample	Crowd funding	R&D
iicon	Gates Foundation	Not UKRI	IVCC	$50,000,000	Gates Foundation	Piloting Approaches
iicon	MRC	UKRI	DRUM	3,000	MRC Grant funding	R&D
iicon	Pfizer	Not UKRI	Pneumococcal Human Challenge	$3,000,000	Pfizer	R&D
iicon	Unilever	Not UKRI	Hand wash study	1,500	Unilever	R&D
media.cymru	AHRC	UKRI	Media, community and the creative citizen	1,142	AHRC Grant funding	Facilities
media.cymru	AHRC	UKRI	Centre of Excellent for Policy and Evidence in the Creative Industries (PEC)	568	AHRC Grant funding	R&D
media.cymru	AHRC	UKRI	REACT - Research and enterprise in arts and creative technologies: REACT KE Hub	226	AHRC REACT	R&D
media.cymru	AHRC	UKRI	Creative Industries Clusters Programme	4,227	Creative Industries Clusters Programme	Piloting Approaches
media.cymru	AHRC	UKRI	Creative Industries Clusters Programme	69	Creative Industries Clusters Programme	R&D
Midlands Advanced Ceramics	EPSRC	UKRI	Standard Grant (F037430)	274	EPSRC Programme Grant	R&D
Midlands Advanced Ceramics	EPSRC	UKRI	Standard Grant (GR/S97996)	208	EPSRC Programme Grant	R&D

PROJECT	FUNDER	UKRI/ NOT UKRI	NAME OF FUNDING CALL	AMOUNT (£000S)	FUND TYPE	TYPE OF IMPACT
Midlands Advanced Ceramics	Innovate UK	UKRI	Ox-Ox CMC funding for aero gas turbine applications	9,344	Innovate UK funding	R&D
Midlands Advanced Ceramics	Innovate UK	UKRI	Innovate UK Nov 17 Sector Competition. Strand 1 Manufacturing and Materials	294	Innovate UK funding	R&D
Midlands Advanced Ceramics	Innovate UK	UKRI	Innovate UK March 18: Sector Competition. Open	130	Innovate UK funding	R&D
Midlands Advanced Ceramics	Research England	UKRI	Strength in Places Fund Seedcorn Stage	50	Strength in Places	Piloting Approaches
MyWorld	AHRC	UKRI	AHRC KE Hubs	4,110	AHRC Grant funding	Piloting Approaches
MyWorld	AHRC	UKRI	Creative Industries Clusters Programme	5,718	Creative Industries Clusters Programme	Partners and consortium building activity
MyWorld	EPSRC	UKRI	Digital Economy	3,994	EPSRC Programme Grant	Facilities
MyWorld	EPSRC	UKRI	Platform Grant	1,363	EPSRC Programme Grant	Facilities
MyWorld	Research England	UKRI	Connecting Capabilities	6,500	Research England Connecting Capabilities	Partners and consortium building activity
MyWorld	Research England	UKRI	UK Research Partnerships Investment Fund	29,000	UK Research Partnerships Investment Fund	Facilities
Smart Data Foundry	UoE DDI Programme	Not UKRI	Data Driven Innovation Hub	300	Data Driven Innovation Hub	Piloting Approaches
Smart Data Foundry	FDATA	Not UKRI	Financial Data and Technology Association	25	Financial Data and Technology Association	Partners and consortium building activity
Smart Data Foundry	Scottish Enterprise	Not UKRI		38	Scottish Government	Piloting Approaches
Smart Data Foundry	Scottish Government	Not UKRI		200	Scottish Government	R&D
Smart Data Foundry	Research England	UKRI	Strength in Places Fund Seedcorn Stage	50	Strength in Places	Piloting Approaches
SmartNanoNI	EPSRC	UKRI	EPSRC Centre of Doctoral Training in Photonic Integration and Advanced Data Storage (CDT-PIADS)	3,000	EPSRC Centre for Doctoral Training	Partners and consortium building activity
SmartNanoNI	EPSRC	UKRI	EPSRC-SFI Centre of Doctoral Training in Photonic Integration	4,300	EPSRC Centre for Doctoral Training	Partners and consortium building activity

PROJECT	FUNDER	UKRI/ NOT UKRI	NAME OF FUNDING CALL	AMOUNT (£000S)	FUND TYPE	TYPE OF IMPACT
			and Advanced Data Storage (CDT-PIADS)			
SmartNanoNI	Invest NI	Not UKRI	Yelo Expansion	2,000	Invest NI	Facilities
SmartNanoNI	Invest NI	Not UKRI	Nanophotonics	9,000	Invest NI	Piloting Approaches
SmartNanoNI	Invest NI	Not UKRI	HAMR (Heat Assisted Magnetic Recording)	7,000	Invest NI	R&D
SmartNanoNI	RAE-Eng	Not UKRI	Seagate-RAE Eng Chair	1,500	Royal Academy of Engineering	Piloting Approaches
The Living Lab	BEIS	Not UKRI	BEIS Science and Innovation Audit	50	BEIS	R&D
The Living Lab	UKRI	UKRI	UKRI Industry Strategy Challenge Fund - From Data to Early Diagnosis in Precision Medicine Challenge	10,000	Industrial Strategy Challenge Fund	R&D
The Living Lab	SFC & Scottish Enterprise (SE)	Not UKRI	SFC & SE - Innovation Centres Phase Two	9,500	Scottish Government	R&D
The Living Lab	Scottish Funding Council (SFC)	Not UKRI	SFC - Innovation Centres	8,000	SFC Innovation Centres	R&D
The Living Lab	MRC /Glasgow & Clyde Valley City Deal	Not UKRI	City Deal funding & UKRPIF funding	16,000	UK Research Partnerships Investment Fund	Facilities
The Living Lab	Higher Education Funding Council for England	Not UKRI	UK Research Partnership Investment Fund (UKRPIF)	10,000	UK Research Partnerships Investment Fund	Facilities
The Living Lab	MRC/EPSRC	UKRI	MRC/EPSRC 2014 Molecular Pathology Node Call	3,430	UKRI	R&D

ANNEX C. PROJECT INTERVIEW TOPIC GUIDES

A.1 - WAVE 1 PROJECT TOPIC GUIDE

A.1.1 - BASELINING ACTIVITIES CARRIED OUT BY PROJECTS

- What, if any, baseline data and/or evidence have you collected for your project-level evaluation? This could include data/evidence related to any indicators relevant to the success of your project in the time period before the project was launched.
- What, if any, baseline data and/or evidence do you plan to collect in future?

A.1.2 - DEFINING RELEVANT REGIONS, SECTORS AND KNOWLEDGE AREAS

A.1.2.1 - SECTORS

- To allow us to analyse the most appropriate data available and to allow matching between datasets, we would like to define each project's relevant sector(s) in terms of SIC codes. From reviewing your application, the most relevant SIC codes appear to be [insert SIC code(s)].
  - Please could you confirm that these SIC codes are up-to-date/complete?

A.1.2.2 - KNOWLEDGE AREAS

- Where appropriate, we would like to define the most relevant knowledge areas/fields in which each project is producing research (or will produce research in future) using subject areas defined by HESA (Higher Education Classification of Subjects (HECoS)). From reviewing your documents the most relevant subject areas appear to be [insert HECoS codes/names].
  - Please could you verify this definition?

A.1.2.3 - REGIONS

- From reviewing your applications, we understand that the postcodes of your chosen economic geography are [insert postcodes].
  - Please could you confirm that these postcodes are up-to-date/complete?

A.1.3 - DEFINING COUNTERFACTUALS

- In order to evaluate the effects of SIPF funding, it is important to think about what would have happened if the funded had not been made available. One way of doing that is looking at similar "sector-region combinations" to SIPF-funded projects (the "counterfactual"), measuring the outcomes of interest for both the SIPF-funded project and counterfactual and comparing across the two.
  - Do you have any suggestions for sector-region combinations that could act as counterfactuals for your project? [Include a specific explanation for each project, e.g. "for Growing Kent and Medway, are there any regions that are similar to K&M which are also places for agricultural R&I?"].

A.1.4 - PAST OR ALIGNED INVESTMENT IN PROJECTS

- Has your project received any past or aligned investment from non-SIPF sources?
  - If yes:
    - Please provide details, including size of awards received, time periods, extent to which purposes overlap with the SIPF-funded project, etc.
    - What do you see as the main ways in which the SIPF project builds on and differs from the aims of those past investments?
    - Are you aware of any evaluation work having been done relating to those past investments? If so do you know when those evaluations were conducted and who led them?

A.1.5 - OTHER VIEWS THAT COULD INFORM THE BASELINE

- [Check the extent to which addressing skills needs is a relevant objective of the project. If it is:]
  - Could you describe the baseline (pre-SIPF) skills profile in your sector-region?
  - Where are the key skill gaps?
  - Pre-SIPF, who were the main organisations seeking to address skills needs in your sector-region?
- Could you describe the nature of baseline (pre-SIPF) collaborations between businesses, academics and local decision-makers in your sector-region?
  - Which groups are collaborating well/less well?
  - Pre-SIPF, were there any bodies or organisations seeking to promote collaboration in your sector-region?
- Could you describe the nature of the baseline (pre-SIPF) reputation (national and international) for R&I of your sector-region?
  - Where is the reputation particularly strong and where could it be improved?

A.1.6 - SUGGESTIONS FOR QUALITATIVE BASELINE INTERVIEWEES

- To help build the picture of baseline in each sector-region, we would like to hold discussions with sectoral and local leadership. These discussions will aim to cover similar questions to those in the previous section, i.e. the current skills profile, nature of collaboration and reputation of each sector-region.
  - Do you have any suggestions/contact details for appropriate individuals we could approach?

A.2 - WAVE 2 PROJECT TOPIC GUIDE

A.2.1 - INTRODUCTIONS

- Please could you briefly introduce yourselves and your project?

A.2.2 - SIPF EVALUATION FRAMEWORK

Frontier to present the SIPF fund-wide logic model and theory of change.

- Do you feel your project fits into this broad, fund-wide framework? Are there any elements that sit outside it?

A.2.3 - THE BASELINE IN YOUR SECTOR-REGION

- Could you describe the baseline (pre-SIPF) skills profile in your sector-region?
  - Where are the key skill gaps?
  - Pre-SIPF, who were the main organisations seeking to address skills needs in your sector-region?
- Could you describe the nature of baseline (pre-SIPF) collaborations between businesses, academics and local decision-makers in your sector-region?
  - Which groups are collaborating well/less well?
  - Pre-SIPF, were there any bodies or organisations seeking to promote collaboration in your sector-region?
- Could you describe the nature of the baseline (pre-SIPF) reputation (national and international) for R&I of your sector-region?
  - Where is the reputation particularly strong and where could it be improved?

A.2.4 - PROJECT-LEVEL EVALUATIONS

- If you're able to at this stage, please could you tell us a bit about your plans for your project evaluation, e.g. key outcomes of interest, relevant datasets, evaluation methods?
- Do you have any ideas for what can be used as the counterfactual for your project, i.e. similar "sector-region combinations" to your project but which did not receive any SIPF funding?

A.2.5 - REQUEST FOR FURTHER INFORMATION

To allow us to analyse the most appropriate baseline data available and to allow matching between datasets, we would like to work with you to define your project in terms of:

a) Sector(s) (SIC codes – we note the SIPF team have requested these from projects)
b) Geography (postcodes – we note these are included in the project application)
c) Knowledge areas (HECOS codes)

- Are you happy for us to follow up via email to confirm your definitions (SIC codes and postcodes) and/or verify our selections (HECOS codes)?

- Do you have any questions about this process?

To help build a picture of the baseline, we are performing a consultation of experts with knowledge of each project's sector-region. The main topics that will be included in the consultation will be skills, collaboration, reputation, equality, diversity and inclusion (EDI), and the quality of commercial R&I/R&D.

- Are you happy to provide us with the names/contact details of any individuals who may want to respond to the consultation (we can follow up via email)? Respondents should not be directly involved with your project but could include individuals from organisations such as universities, industry bodies/professional associations, Local Authorities, LEPs or Royal Colleges/Academies.
- Do you have any questions about this process?

ANNEX D. BASELINE INTERVIEW TOPIC GUIDE

DEFINING PLACE-BASED R&I POLICY

- How would you **define placed-based R&I policy**?
- Are you **involved with place-based R&I** policy making? *If so:*
  - What **evidence** is available for you to draw on?
  - Which **experts** do you speak to/work with?
  - In your view, how complete is the **knowledge base** around placed-based R&I policy?

SIPF AND OTHER PLACE-BASED FUNDING PROGRAMMES

- What is your current level of **awareness of the SIPF** programme?
- Are you aware of **other place-based R&I funding programmes** beyond SIPF?

SIPF AND COLLABORATION BETWEEN STAKEHOLDERS

- What is your understanding of **how SIPF drives collaboration** between different stakeholders (e.g. industry, researchers, local government)?
  - To what extent does **place** play a particular role in this?

OTHER INFORMATION

- Is there **anything else** you would like to add to help with our understanding of baselining for SIPF?

ANNEX E. BASELINE CONSULTATION TEMPLATE

DETAILS OF INDIVIDUAL

- Name:

- Job title and organisation:

- Is there a particular **sector** you can speak most knowledgably about? *For example, Advanced Manufacturing.*

- Is there a particular **region** you can speak most knowledgably about? *For example, Scotland.*

- Are you **actively involved in one or more of the SIPF projects**? If so, which project(s) and what is your role?

SKILLS

Thinking about 2019…

- How would you characterise the **skills profile** in your sector and/or region? *For example, this could be in terms of the volume or quality of formal training, courses or qualifications, or in terms of "softer" skills such as leadership.*

- Where were the key **gaps**?

- Who were the **main organisations seeking to address skills** needs in your sector and/or region? *This could include cross-sectoral or national/supranational organisations, as well as sector-specific or regional ones.*

COLLABORATION

Thinking about 2019…

- To what extent did businesses, academics and local decision-makers **collaborate** in your specific sector and/or region?

- What was the **nature** of this collaboration? *For example, were there formal or informal networks?*

- Which **groups** were collaborating well/less well?

- Who were the **main organisations seeking to promote collaboration** in your sector and/or region? *This could include cross-sectoral or national/supranational organisations, as well as sector-specific or regional ones.*

REPUTATION

Thinking about 2019…

- What was the **reputation** of your specific sector and/or region? *For example, this could be in terms of the academic standing of universities, or the national and international reputation as a centre of innovation in relevant sectors.*

- Where was the reputation particularly **strong and where could it be improved**?

EQUALITY, DIVERSITY AND INCLUSION (EDI)

Thinking about 2019…

- How **equal, diverse and inclusive** was your sector (particularly in your specific region, if applicable)? *For example, this could be in terms of representation and opportunities for people of different genders, ethnicities or geographic/social backgrounds, or people with disabilities.*

- Where were the **strengths and where could EDI be improved**?

- Were there any **organisations seeking to address EDI** in your sector? *This could include cross-sectoral or national/supranational organisations, as well as sector-specific or regional ones.*

QUALITY OF COMMERCIAL R&I/R&D

Thinking about 2019…

- How would you describe the **quality of the industry-led, commercial R&I/R&D** in your specific sector and/or region? *For example, this could be in terms of the quality/impact of patent, trademark and design applications.*

- In what areas was commercial R&I/R&D particularly **strong** and where could it be **improved**?

OTHER

- Is there **anything else** you would like to add to help with our understanding of baselining for SIPF?

ANNEX F. SUMMARY OF PROJECT VIEWS ON FEASIBILITY OF SECTOR-REGION COUNTERFACTUALS

In the Evaluation Framework Report (see Section 6.1), we explain that a range of counterfactual approaches will be required for the impact evaluation. To understand the feasibility of the various approaches, as part of our baselining interviews with SIPF-funded projects, we asked each of the project representatives for suggested sector-region combinations that could act as counterfactuals for their projects. Overall, the projects emphasised the uniqueness of the SIPF investments and therefore the challenges associated with identifying appropriate comparators in terms of both sectors and regions. The following is a summary of the findings, structured by project.

WAVE 1 PROJECTS

Decarbonising Maritime Transportation

- It is challenging to identify sector-region combinations that are comparable to the maritime sector in NI. However, UK regions that are centres for maritime include Dundee, Plymouth and Merseyside/Liverpool.
- One could also look to compare to other sectors where intellectual property (IP) is a significant barrier to entry, such as aerospace. For example, Southampton has a large aerospace hub, including BAE Systems.

CS Connected

- It is difficult to find domestic comparators for CS Connected as the firms are operating in a unique context. One possibility is to use a historical comparator: there was significant semiconductor activity in Scotland in the 1970s-1980s (known as 'Silicon Glen'). However, this was a different time and a different technology.
- One possibility would be to compare to Welsh recipients of the European Regional Development Fund (ERDF).

Smart Data Foundry

- Financial services are highly concentrated in London, making it difficult to identify similar regions to central Scotland. Smart Data Foundry is still developing its thinking on counterfactuals.

Growing Kent and Medway

- It is challenging to find a suitable for comparator for Growing Kent and Medway as the project is unique in being the home of protected horticulture and tree crop growing. However, the most appropriate comparator may be the James Hutton Institute and the area around Dundee/Aberdeen. This area has pockets of multiple deprivation, making it similar to Kent/Medway.
- Other possibilities include: Greater Cambridgeshire and Greater Peterborough LEP area, Norfolk and East Anglia and the West Midlands area (e.g. Worcestershire LEP, and Stoke-on-Trent and Staffordshire LEP).

IICON

- It is extremely difficult to choose an appropriate comparator for IICON. The project team has been attempting to do this for some time and has not succeeded. There are life sciences clusters elsewhere in the UK, e.g. 'Golden Triangle', but these do not focus on infection.

- There are some international comparator regions that focus on infection. These include the German Centre for Infection Research, and the Institute for Global Health and Infectious Diseases at the University of North Carolina.

Living Laboratory

- There are a number of potential options for comparators but none of them is perfect. The University of Edinburgh has received investment in medical innovation but it is difficult to compare to the Govan area of Glasgow as it is not an area of multiple deprivation.
- One could compare with other Centres of Excellence for Precision Medicine (as identified by UKRI), e.g. Manchester (a city with areas of multiple deprivation). Newcastle could also be a comparator as it has some life sciences industry presence.

MyWorld

- Cardiff would be a natural comparator for MyWorld. However, SIPF funding of media.cymru is likely to cause issues for this comparison.
- Other possible comparators include Greater Manchester, Edinburgh or Belfast. The NESTA report on creative industry clusters could provide helpful information[39].

WAVE 2 PROJECTS

AMPI

- It is very hard to find a comparator as the SIPF funding was awarded based on the unique skills and opportunities in the region. For a more nuanced or qualitative comparison, the West Midlands or West of England could be appropriate.
- At a project level, to test the 'effectiveness' of the project in achieving its KPIs, AMPI are exploring comparing companies they work with against other companies, using FAME data[40].

Digital Dairy

- It is very difficult to find a region-sector comparator. The South West (Cornwall, Devon, Bristol) is a possibility but it has twice the number of cows and is dominated by large international dairy processing companies.
- South Wales and the Midlands are other possible counterfactuals. However, they are somewhat smaller than Cumbria and South-West Scotland in terms of dairy production and the geographies are quite different.

media.cymru

- Possible comparators are Manchester, Leeds and Belfast. Bristol would also be a possibility but it is receiving SIPF funding (MyWorld), which would complicate the comparison.

Midlands Advanced Ceramics

[39] https://www.pec.ac.uk/research-reports/creative-radar

[40] https://www.bvdinfo.com/en-gb/our-products/data/national/fame

- It is very difficult to define a counterfactual or suitable control group. There are no comparable regions in terms of ceramics.

SmartNanoNI

- There is the compound semi-conductor cluster in South Wales, although the product is different (and SIPF investment in CS Connected would complicated the comparison).
- There are a large number of photonics firms in Scotland but these are not particularly comparable: the firms are larger and the expertise is spread over a large number of firms (as opposed to being situated together in a cluster).