

SME Access to Finance for Innovation in the Heart of the South West, Cornwall and the Isles of Scilly

Report to the Heart of the South West LEP, Cornwall
and the Isles of Scilly LEP and Innovate UK by Belmana

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Belmana
ANALYSIS FOR POLICY



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Innovate UK drives productivity and economic growth by supporting businesses to develop and realise the potential of new ideas. We connect businesses to the partners, customers and investors that can help them turn ideas into commercially successful products and services and business growth. We fund business and research collaborations to accelerate innovation and drive business investment into R&D. Our support is available to businesses across all economic sectors, value chains and UK regions. www.innovateuk.ukri.org

Innovate UK and the Heart of the South West LEP & Cornwall Isle of Scilly LEP commissioned this independent research and as such the accuracy and views of the content within it is the responsibility of Belmana.

Foreword

From Ian Campbell, interim Executive Chair Innovate UK

At Innovate UK we are committed to making the UK one of the very best places in the world for businesses to innovate and grow, ensuring innovators everywhere can receive the support they need to develop their ideas. This matters because business-led innovation is how we will maximise the economic and societal benefits of new ideas over the long term.

That goal requires support and investment in entrepreneurs and businesses across the UK that have the ambition and potential to contribute to economic growth and society through innovation. It is what we do, alongside many others, and it's through the support of the Local Enterprise Partnerships (LEPs) that enables us to foster great places to innovate.

The UK has a rich heritage with world-leading businesses located around the country. Our cities, towns and rural areas have competitive advantages that will be essential to shaping our economic future and every region in the UK has a role to play in boosting the national economy.

Since 2016, Innovate UK has invested over £100m in the Local Enterprise Partnership areas of Cornwall and the Isles of Scilly, and the Heart of the South West to date, and we've committed to work together to ensure local innovative businesses continue to get the right support they need to succeed.

These two LEP areas have a higher number of businesses in knowledge intensive manufacturing sectors than the national average, but the report finds that, overall, those businesses currently secure significantly lower than average Innovate UK funding, relative to the size of their business population.

In partnership, we pledged to share and translate ideas and to develop opportunities for greater collaboration to increase innovation rates across the region. So, we commissioned this report to explore the factors contributing to the relatively low uptake of Innovate UK funding within the two LEPs, to understand how we can harness the potential of this thriving region.

I look forward to seeing how the findings, along with the local industrial strategies, will help to shape the development of this region. By continuing to work together, we will make sure businesses right across the South West get access to as much support as possible to fulfil their innovation potential.

Executive Summary

Purpose

1. The Local Enterprise Partnership areas of Cornwall and the Isles of Scilly (CIOS), and Heart of the South West (HotSW) are generally characterised by relatively low levels of innovation within the business base, which is predominantly SMEs, and especially small and micro businesses. Lower levels of innovation are considered to in turn contribute to the LEP areas lagging other parts of the UK in terms of productivity.
2. As part of addressing this, the two LEPs have signed a Memorandum of Understanding with Innovate UK (IUK), part of UK Research & Innovation, agreeing to work together to increase take-up of Innovate UK funding amongst SMEs across the area. This study provides evidence and recommendations in order to support this joint ambition.

Findings from the study

Profiling Innovation: Levels of Innovate UK funding

3. Whilst the south west as a whole has a relatively proportionate 'share' of Innovate UK funding, the majority of this – around 80% - is concentrated around the West of England/Gloucestershire area.
4. Cornwall and the Isles of Scilly (CIOS) and the Heart of the South West (HotSW) LEPs secure a smaller share of the Innovate UK award value than would be expected given their share of the national business population.
5. In comparison West of England LEP punches above its weight in terms of accessing Innovate UK funding with a greater share of funding secured than its share of the UK's business base.
6. The relative performance of the two LEPs in terms of accessing IUK funding can be measured by the 'IUK funding gap', representing the discrepancy between IUK funding secured by organisations within the two LEP areas and what would have been expected should they have performed in line with the national average.
7. The IUK funding gap observed across the two LEP areas includes both discrepancies between the level of funding awarded to the two LEPs enterprises (i.e. a 'private sector funding gap') and research organisations (i.e. an 'academic beneficiary funding gap').
8. The difference between the IUK funding secured by enterprises across the two LEPs and what would have been expected if businesses within the areas were to have secured IUK funding in line with national averages (i.e. 'private sector funding gap') has two components:

- a. The additional funding that would have been expected to be secured if the two LEPs had beneficiaries in proportion to the relative size of their business bases. This component of the gap has been estimated at £84m across both LEPs.
 - b. The additional funding that would have been expected to be secured if each beneficiary secured the same amount of funding per project as seen nationally. This element of the gap has been estimated at £40m across both areas.
9. Of the two areas CIOS LEP has the most significant private sector IUK funding gap. Businesses in CIOS LEP area secured £10m of IUK funding whereas if the award value reflected the LEPs share of businesses a further £39m would have been expected to have been awarded suggesting an 80% funding gap.
10. In HotSW LEP, whilst the private sector funding gap represents a larger volume of IUK funding, proportionally the gap is significantly smaller than in CIOS, with IUK grants secured by businesses in HotSW LEP having been £63m and the gap estimated to be £85m, suggesting that HotSW LEP's businesses are relatively more successful in accessing IUK grants than CIOS' enterprises but with a 57% funding gap.
11. Where IUK awards funding to academic bodies within the two LEP areas, had these been proportionate with the national average a further £47m of R&D could have been expected to have been awarded - £11m in CIOS and £36m in HotSW. This academic IUK funding gap is considered likely to be largely due to the relatively low presence of research organisations within the two LEPs rather than reflecting on the performance of individual research institutions within the two LEP areas themselves.

Factors contributing to the relatively low uptake of Innovate UK funding

12. A range of interrelated factors have been identified as contributing to the IUK funding gap observed in the two LEP areas including the impact of the:

LEP areas' economic geography, business and research bases

13. The two LEPs are located on a peninsula of England with a relatively low density of population, businesses and economic activity compared to the UK as a whole.
14. The two LEP areas contain relatively few large businesses, and the innovative businesses in the LEP areas tending to be small lowering the chance of them being an IUK beneficiary and suggesting that any grants secured will be of a smaller amount.
15. There is also lower density of research institutions in the two LEP areas.
16. Together the lower than average amount of large business and research institutions has both:
 - A direct impact in terms of less IUK funding being secured directly by such institutions themselves, as well as

- A secondary impact as the presence of research bodies and large private sector organisations generally acts to stimulate innovation activity, and IUK grant success, amongst the wider business base.

17. The two LEP areas have a higher number of businesses in knowledge intensive manufacturing sectors than the national average. This has not however translated into IUK funding awards as expected. Knowledge intensive manufacturers ordinarily have a high propensity to receive Innovate UK funding, higher than service sector businesses, where the two LEPs have a lower share of businesses than is the case nationally. The reduced chance of knowledge intensive manufacturers in the two LEPs being IUK beneficiaries is due to there being few large manufacturing enterprises in the two LEPs, with a concentration of knowledge intensive manufacturing SMEs.

Needs, capabilities, and approach of CIOS and HotSW enterprises in terms of Innovate UK funding

18. IUK success rates are lower across both LEPs, and more so for CIOS. CIOS and HotSW businesses are less likely than those in other areas to be successful in securing first IUK funding and then going on to second projects having completed a first.

19. Businesses in the two LEPs are less likely to transition beyond Innovate UK 'starter products' (defined as Vouchers, SBRI, Smart and KTPs predominantly) to the larger funding products, primarily collaborative R&D and large project investments.

20. CIOS businesses are much more likely to receive grants targeted at SMEs, something not seen to the same extent in HotSW but nevertheless a feature of both LEPs. Such grants tend to be of a low value reducing the average grant size per successful award.

21. Across both LEPs businesses are less likely to lead IUK collaborative R&D (CR&D) projects or other high value IUK products.

22. In CIOS there is evidence that businesses seeking collaboration are unlikely to look far beyond the local area for partners.

Findings from the profiling of innovative businesses not in receipt of IUK funding

23. Business characteristics that could help targeting and increase the uptake of IUK funding were identified.

24. There are two profiles of businesses which have many businesses that could be targeted to increase the take up of Innovate UK funding within the two LEP areas.

- Patent holding business that have not yet secured IUK funding: there are over 200 businesses that hold a patent but are not Innovate UK beneficiaries which could be targeted.
- Businesses reporting export sales that also hold one or more patents: Of the 41 businesses in the two LEPs that hold a patent and report export sales

there are 22 businesses that do not appear in the Innovate UK beneficiaries list which could be targeted.

Results of business innovation level mapping

25. The mapping conducted indicates that there is clustering of businesses having been identified as innovative around:

- a. University centres where there are also a limited number of large beneficiaries of Innovate UK funding.
- b. Localities where there are bases of operation for large multinational companies, which themselves tend to be significant beneficiaries of Innovate UK funding.

26. Outside these clusters, there is a spread of innovative businesses, especially near major roads and around urban areas.

Stakeholder Views

27. Several themes could be identified from the stakeholders interviewed relating to the nature of innovation across the two LEP areas and the relatively low amounts of IUK funding awarded, including reference to:

Profile and capabilities of businesses in the LEP areas

28. The dominance of small and micro enterprises and the limited number of large multinationals and anchor businesses in the two LEPs was considered as a barrier to the uptake of higher levels of IUK funding. As larger enterprises were considered as driving innovation by:

- Supporting SMEs through collaborations leading consortiums of businesses including SMEs.
- Spinning out SMEs either as employees take opportunities outside the large business or as associated researchers and academics capitalise on working with large businesses.

29. The high number of businesses where the owners have low growth ambitions due to lifestyle decisions was highlighted as potentially contributing to the low rates of IUK grant awards across CIOS and HotSW.

30. It was felt that often the small teams in SMEs lacked the breadth of skills to cover all they must do – beyond winning funding – to successfully innovate (such as developing strategy, understanding customers, partnering to access skills and facilities etc.).

31. There is the perception that SMEs have shortages in specific key skills, particularly those needed to write the bid. Many SMEs had difficulties accessing bid writers and proposal-writing was being undertaken by managers in their private time because of this.

Strategic context and the role of LEPs in promoting innovation

32. Businesses observed that there are multiple government bodies for innovation and that these bodies change. Keeping track of this was considered difficult for businesses.

33. The LEPs' Local Industrial Strategy could help promote innovation in their areas through clearly identifying the innovation priorities of the two LEPs and by reducing the risk that priorities set for the areas would not be customised for the local context of each LEP area.

34. In Cornwall and the Isles of Scilly there was perceived to be multiple alternative funding sources, both related to innovation and outside innovation. Strategy setting was seen as an opportunity for a more co-ordinated approach across multiple ERDF (or its replacement(s)) funding opportunities, and other regional funds, in order to provide a more cohesive offer covering loans, capital investment, start-up support.

Role of Innovate UK

35. The businesses interviewed expressed support about their interaction with Innovate UK. Some had a long experience with the products and there was a good awareness about these, but there is evidence that awareness of Innovate UK funding amongst those not routinely involved in innovation is low.

36. It was perceived that the Innovate UK presence in the two LEPs was relatively modest in comparison to other areas, possibly making a strategic dialogue about Innovate UK funding more difficult. The distance of the two LEPs from London and Bristol was noted as a constraint for businesses finding out about Innovate UK opportunities. Many interviewees highlighted that businesses would find it difficult to attend information sharing events organised by Innovate UK, which tended to be in large cities away from the LEP areas.

37. The processes to apply for IUK funding, while complex, were considered to be useful for businesses in translating innovation ideas into projects.

38. Of Innovate UK products, Knowledge Transfer Partnerships (KTPs) were considered to have a less administrative burdensome application process and applicants perceived themselves as having a better chance of success when applying for these.

39. Innovation Vouchers were also cited as a straight forward IUK support offer.

40. It was highlighted positively that Innovate UK's funding was paid in a timely manner (compared to a view that some ERDF funding was quite late in payment meaning firms felt cash constraints).

41. It was considered that if more guidance about what IUK judging panels are looking for could be provided to applicants that this would enable higher success rates.

Role of innovation advice and business support

42. Support from business support initiatives to help businesses access funding and innovate was highlighted as important to increasing the uptake of IUK grants, with Innovate2Succeed and SetSquared cited as examples of good practice.

43. It was noted that those involved in innovation advice for SMEs saw it as part of their role to connect the SMEs to those interested in commercialising innovations but at times found it challenging to do this effectively.

44. It was suggested that those tasked with engaging with businesses in order to promote innovation funding would benefit from information about which businesses may be more likely to have innovative ideas and seek innovation funding (i.e. such as those identified through tagging in this study). In this respect investment from Growth Hubs, and other information providers, in better targeting the information they provide to businesses seeking to innovate would be effective in increasing the uptake of IUK grants across the LEP areas.

45. Interviewees observed the need for business/ innovation advisors to be able to understand a business' capability to take the steps to commercialise their innovations.

46. R&D tax credits were considered as a useful non-IUK offer that supports innovation, particularly due to ease of application.

The role of research institutions

47. It was noted that connections between innovators and actors interested in commercialisation of innovations were often facilitated by universities, with the universities of Exeter and Plymouth noted as having strong links with multinational, innovative businesses in several sectors. Such links were considered to draw local SMEs into research collaborative research with larger enterprises despite the multinationals not having a presence in the LEPs. Falmouth University's entrepreneurship Launchpad was also cited positively.

48. The relatively low level of research infrastructure that businesses in the two LEPs can easily access, partly because being a peninsula limits access to universities and research facilities in the rest of the UK, was considered a structural barrier to increasing innovation and IUK grant awards across the LEP areas.

49. It was highlighted that long-term innovation relationships were often built with the universities and research facilities as the institutions (and their staff) were more stable than government funded support entities.

50. Many businesses saw working with universities and research facilities as very important in addressing their lack of capacity in terms of bid writing expertise, as it was perceived that university staff often had skills in writing bids.

51. The need for SMEs to familiarise themselves with equipment hosted by research facilities was identified, as were positive steps by those research bodies to develop and secure funding for initiatives which enable businesses to make the first steps towards collaborating with research facilities. Facilities such as University of Plymouth Electron Microscopy Centre provided high-end instruments and skills for key innovation steps, such as testing. Experience sharing events and a funded programme for businesses to try the equipment were specifically highlighted as being welcome.

Issues and Recommendations

52. Interviews with businesses and stakeholders confirmed the empirical findings and then explored next steps in terms of the issues that emerge for the two LEPs in accessing Innovate UK funding. The issues are discussed in the chapters of the report.

Issue 2.1, discussed in chapter 2: The share of the LEPs in Innovate UK funding appears low due to fewer and smaller projects securing funding than national averages, with this being more pronounced in Cornwall and the Isles of Scilly LEP.

Recommendation for policy development: As LEPs develop innovation strategies, the scale of the funding gap can help shape the overall priority to increasing the level of innovation funding. Also, the evidence suggests a focus on encouraging scaling up of the size of projects seeking funding.

Issue 2.2: There is a need to build on collaboration, deepening the existing links between SMEs, larger businesses and research organisations.

Recommendation for policy development: LEPs build on the collaborations developed in applying to recent funding calls (particularly Strength in Places Fund). This would involve Innovate UK to raise the profile of the wider funding opportunities and allow businesses to feed into Innovate UK priority setting.

Issue 2.3: Academic funding for innovation is lower in the two LEPs than would be the case if it was allocated based on business counts (because the two LEPs host few research organisations). There may be value in thinking creatively about how to tackle the lower access to research organisations due to location.

Recommendation for research infrastructure: Innovate UK consider options to allow businesses to access (virtually or other means) a greater portion of the UK's research excellence. This may involve events targeting sectors. This might be modelled on the Satellite Application Catapult developing presences in the LEPs or seek to draw into the two LEPs more Universities at events, perhaps building on existing links with the LEPs' businesses.

Issue 3.1, discussed in chapter 3: Profiling using the public data provides a start for any organisations advising businesses about innovation funding and this can then be tailored by advisory bodies.

Recommendation for navigating the support landscape: LEPs/Innovate UK encourage Growth Hubs and other business support bodies to use public data. These would identify businesses that are innovation active but not seeking support, or businesses that have received starter products from Innovate UK and may be able to move to further investments. These can be enhanced in formal interactions (such as the Innovate2Succeed scheme) and augmented by other datasets about business support.

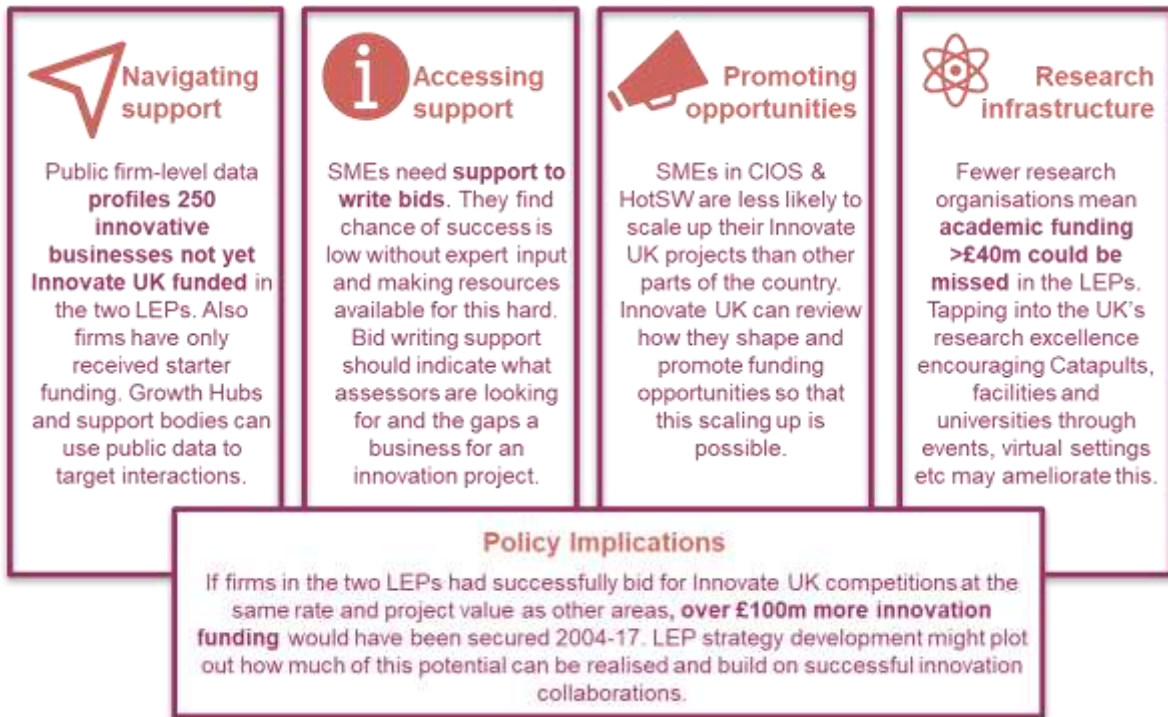
Issue 3.2: Innovative SMEs see making a strong bid for funding as difficult, requiring skills that they may not possess

Recommendation for accessing funding: LEPs with Innovate UK provide support for bid writing. This could involve specific SME support, or workshops and sector specific events. Key would be content about making a persuasive bid and filtering the SME's application.

Issue 3.3: Scaling up the bids for Innovate UK funding has been less than other areas. This may be linked to the relative paucity of research infrastructure (Catapults etc) in the two LEPs and limited interaction of SMEs in the LEPs with Innovate UK priority setting.

Recommendation for promoting funding opportunities: Innovate UK may review how they can routinely engage with SMEs as they shape funding priorities. The good practice highlighted included having theme specific events mixing SMEs with research customers (as used by MOD for defence), events at facilities or incubators.

Figure: Findings and recommendations



1. Introduction

1. The Local Enterprise Partnership areas of Cornwall and the Isles of Scilly, and Heart of the South West are generally characterised by relatively low levels of innovation within the business base, which is predominantly SMEs, especially small and micro businesses; lower levels of innovation in turn contributes to the LEP areas lagging other parts of the UK in productivity.

2. As part of addressing this, the two LEPs have signed a Memorandum of Understanding with Innovate UK, part of UK Research and Innovation, agreeing to work together to increase take-up of Innovate UK funding amongst SMEs across the area. At present, whilst the south west as a whole has a relatively proportionate 'share' of Innovate UK funding, the majority of this – around 80% - is concentrated around the West of England/Gloucestershire area.

This Study

3. As a step to developing further actions, the two LEPs with Innovate UK commissioned this research to better understand the inhibitors to SMEs engaging with Innovate UK and securing funding for innovation. These were assumed to be

- lack of awareness
- lack of capacity and expertise (in particular for smaller enterprises) both to apply and to deliver / co-fund projects
- actual and perceived bureaucracy / administrative burden, including lack of expertise to develop bids
- structural issues, e.g. the design of funds may favour consortia of larger businesses
- a locality, e.g. Cornwall, is used to one source of funding such as EU funds, and the difference in application methods is therefore a barrier.

4. The research draws on existing information, including Innovate UK data on success rates of businesses within the area, comparing with regional levels and nationally.

5. The rest of this chapter describes the approach taken in the study. The next chapter then describes the innovation landscape in the two LEP areas, presenting evidence about the types of businesses in the area, their investment in research and development, and an analysis of the applications made to the Innovate UK and other funding streams. The evidence from the interviews is then considered, and the chapter describes some of the strategic issues emerging for SMEs exploring funding for innovation.

6. The third chapter looks at the firm level evidence in more detail relating the evidence to the stages of a business seeking and then securing funding for

innovation. It describes some of the opportunities and constraints faced by SMEs, which feed into the concluding remarks in the final chapter.

7. The study has benefitted from views of businesses and stakeholders that were interviewed for this research. The report integrates these into the findings from other sources, primarily the analysis of business data and data about funding secured by businesses.

Study Approach

8. The approach puts an emphasis on analysis that looks across different evidence sources, integrating quantitative and qualitative research to understand the current innovation landscape in the Heart of the South West and Cornwall and Isles of Scilly LEPs. The purpose of the quantitative task is to understand the local base of (potentially) innovative businesses and their access to innovation funding. Then, the second stage of qualitative research explores the access barriers that exist.

Quantitative Analysis of Business Data

9. The quantitative research compiled thousands of incidences of government support for innovation at firm-level, drawing together the Innovate UK database of funded projects and support, the public data about Knowledge Transfer Partnerships (KTP) and other significant funding streams for innovation in the UK. This provides detail about the organisations supported – Universities, research facilities, public bodies as well as businesses – by the nature, time and amount of support. For the businesses, the data was linked to the Companies House register, to patents owned, FAME accounts data and geographical data, such as whether a business' postcode is that of an incubator or accelerator. The annex details this.

10. The analysis “tags” the firms for innovativeness, seeking to identify business characteristics that correlate with receiving innovation funding, as well as link in the actual support secure by a business. In all, this provides a dataset about actual funding with evidence about all businesses, many on an innovation journey but not in receipt of the support. Further, because the firm-level data on support received can be linked across incidences, the data allows an exploration of follow on support provided to the businesses.

11. As business post code is available, this enables identifying the supported businesses' locations and analysis can be undertaken by LEP area or other geographies. The study also extracted key published statistics such as the detailed employment data and business numbers by industry and by middle super output areas available in NOMIS. Evidence compares the two LEPs with the rest of England. Using the firm-level data, evidence can be compiled flexibly, allowing insight about the two LEPs.

12. A key dimension of the analysis has been to recognise that the public data about innovation funding only covers successful applicants. So, the tagging was used to explore businesses that appear to be innovative but did not receive Innovate UK project funding. These are businesses that are R&D intensive, in the right sectors, about the right size and age, but do not appear on the Innovate UK beneficiary project list. These were discussed with stakeholders in the qualitative phase.

Qualitative Research

13. The quantitative analysis has been complemented by qualitative research, with 15 interviews, spread across stakeholders (an innovation centre, an investor, three universities), five businesses and a wider set of policy and delivery bodies (one growth hub and four support providers). For each of the three strands of interviews, topic guides for semi-structured interviews have been used. This would cover the interviewee's understanding of the business support landscape in the area. It would then turn to the experience of businesses in accessing support and the specific difficulties or successes accessing innovation support. Interviews explore awareness and any capacity and expertise issues in applying to Innovate UK and other funding sources.

14. Interviews lasted about 45 minutes for stakeholders and 20 minutes for businesses. They were recorded with the consent of the interviewees. Notes were made from the recordings in a spreadsheet and coded by the themes emerging in analysis. Where the discussion was with a stakeholder, a slidepack of some of the quantitative findings was sent ahead of the discussion, including an indication of the location of businesses supported by Innovate UK. This was also a means for the stakeholders to direct the researchers to businesses and many stakeholders kindly provided introductions.

2. Strategic Insights

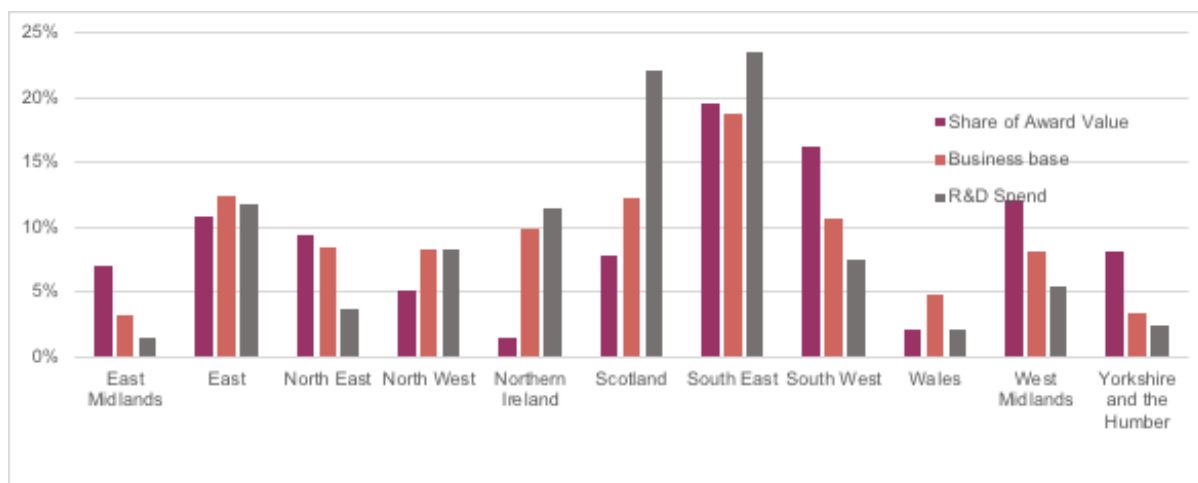
1. This chapter presents a regional and strategic perspective on the innovation funding in the Local Enterprise Partnership areas of Cornwall & Isles of Scilly (CIOS) and Heart of the South West (HotSW). It considers the regional landscape of the South West and breaks down the analysis by the two LEPs.
2. The South West region has a good record in innovation but includes the heavily industrialised and innovation-active firms based in and around Bristol, clouding the picture and potentially missing some of the challenges seen further west in the region. This chapter firstly draws out the regional perspective and then focuses on the two LEPs. The two LEPs are then characterised in relation to their business base.
3. The chapter then considers the level of funding received by businesses in the two LEPs from Innovate UK, building an estimate of what share of total funding might be expected. Businesses in the LEPs are securing less funding than might be expected and the chapter discusses some of the strategic context for innovation funding in the two LEP areas, particularly the scale of and access to research infrastructure. Some of the quantitative findings are then contrasted with views expressed by interviewees in the qualitative strand in this research.

Innovation Funding in the South West

4. Innovate UK releases data about the funding the body provides to UK businesses to invest in innovation. Funded projects from 2004-2017 are listed by each participant, reporting the detail about the project, its total cost, period of operation and the Innovate UK competition from which funding was secured. The completeness of the dataset increases over the period, with the post 2013 coverage very high.
5. The data allow an analysis by regions and LEPs and, using statistics about UK businesses at a regional and LEP level, allows an initial exploration of whether the funding secured in HotSW and CIOS are proportionate to the business and innovation activity in the two LEPs. Following the approach of a recent study of the North West (Hatch Regeneris, 2018), the focus is comparing Innovate UK funding 2008-17 with business counts in 2018 and the R&D expenditure of businesses 2016.
6. Figure 2.1 presents the percentage shares for three indicators by regions: Innovate UK funding, business counts and business expenditure on R&D. London is excluded here because of known comparability problems, such as companies will locate their Innovate UK project to the head offices in London. This makes share analysis difficult to compare if London is included, as ONS business counts and R&D statistics use survey evidence to allocate the research activity to the region or LEP where it takes place.

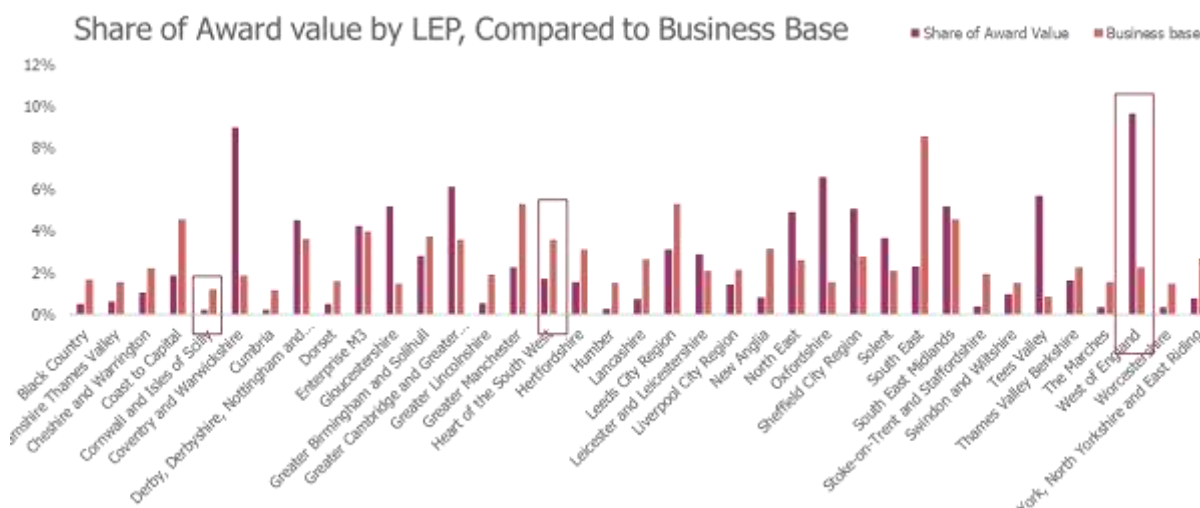
7. The figure indicates that 16% of the funding that is reported in the Innovate UK database outside of London will be spent in the South West. This proves to be quite high in comparison with the region’s share of businesses (10%) and R&D (7%), suggesting that the region is successfully securing support from Innovate UK in relation to its R&D and business population. Other strong regions on this measure are the East Midlands, West Midlands and Yorkshire and Humber.

Figure 2.1: Comparing Innovate UK funding to businesses and R&D



8. However, the regional analysis aggregates across the South West region’s six LEPs which differ in terms of business demographics and innovation characteristics. The West of England LEP covers Bristol, Bath and the northern portion of Somerset and is the home to several innovative clusters. Further, it includes the cluster of high technology businesses in South Gloucestershire. Figure 2.2 presents evidence at an LEP level to understand the landscape for the two LEP areas.

Figure 2.2: Comparing Innovate UK funding to businesses across LEPs



9. The figure indicates that the good performance of the South West is primarily due to the West of England LEP, boxed on the right-hand side of the figure. The two LEPs in the west of the region have a smaller share of the Innovate UK award value. Further, whereas the West of England LEP punches above its weight, with Innovate

UK funding greater than the share of the national business base, the CIOS and HotSW LEPs' shares both fall below their shares of the business base.

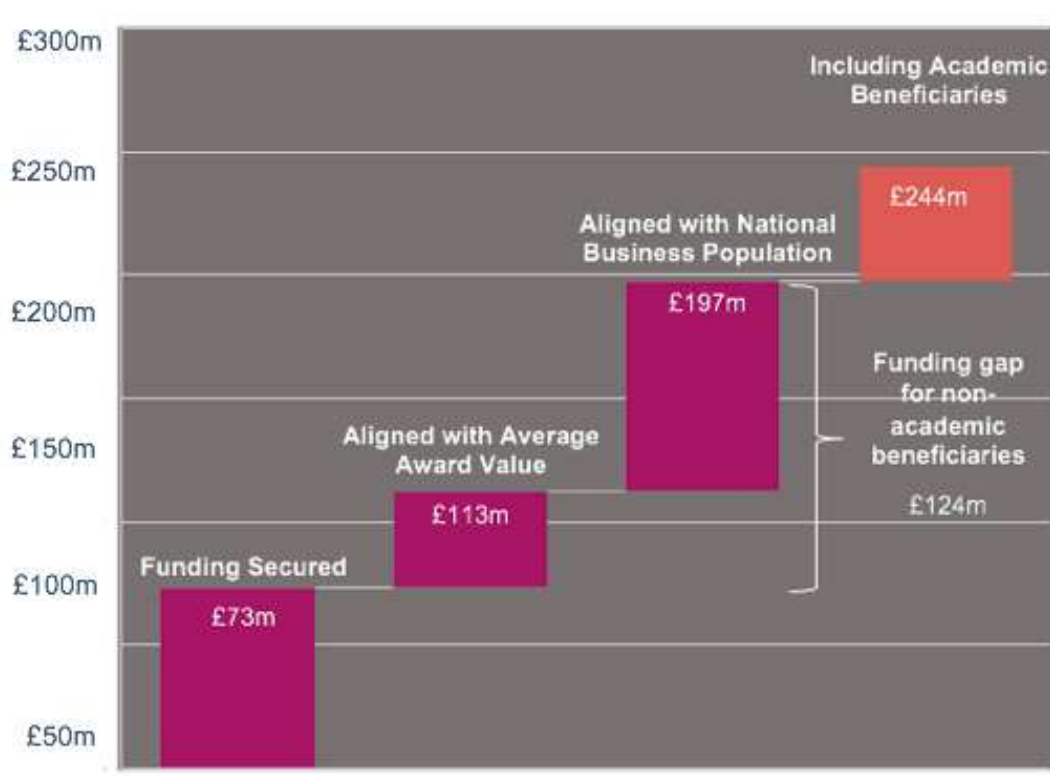
Estimating the Innovate UK Funding Gap

10. This section considers the scale of funding from Innovate UK the CIOS and HotSW might receive under different assumptions. The assumptions primarily seek to align the behaviours seen in businesses in the two LEPs with those seen across the country, in terms of the numbers of businesses in the two LEP areas, the propensity to secure Innovate UK funding and the size of the grants awarded.

11. Figure 2.3 presents a gap analysis of the funding that is secured by the two LEPs as behaviours are aligned.

12. On the left-hand side, it indicates the Innovate UK funding for projects in the two LEPs. As the analysis moves to the right, the amount is uplifted on the assumption, firstly, that the average award in the two LEPs was the same as the UK average awards. The second uplift is due to align the likelihood of businesses in the two LEPs to secure funding than the higher national average. The final uplift adjusts for the relatively small presence of research organisations in the two LEPs. When Innovate UK funding is analysed by LEPs and beneficiary type it is possible to identify the funding that has gone to academic organisations, and this uplift reallocates this funding by business counts rather than the location of research organisations.

Figure 2.3: Innovate UK Funding: Gap analysis for two LEPs



13. The funding secured by the two LEP's businesses, at around £73m, is the first column. The figure is then illustrative in the sense that – moving from the left to the

right – the assumptions made could take somewhat different basis, driving different estimates of the scale of funding gaps.

14. A first assumption tests what would happen if the projects winning awards in the LEPs received grants equal to the average project size. This would result in the funding secured by the two LEPS rising to £113m.

15. The next uplift reflects the lower propensity of the businesses in the LEPs to secure Innovate UK funding. Around 4% of businesses are in the two LEPs according to ONS NOMIS data. Were 4% of the total awards made to businesses in the two LEPs, this would suggest £197m of the Innovate UK funding would have been to the businesses in the two LEPs.

16. The first three columns in the figure focus on the grants given to businesses only. The final column adds a further £47m, representing the funding share of the academic research Innovate UK funds, had that been allocated by the share of businesses in the two LEPs.

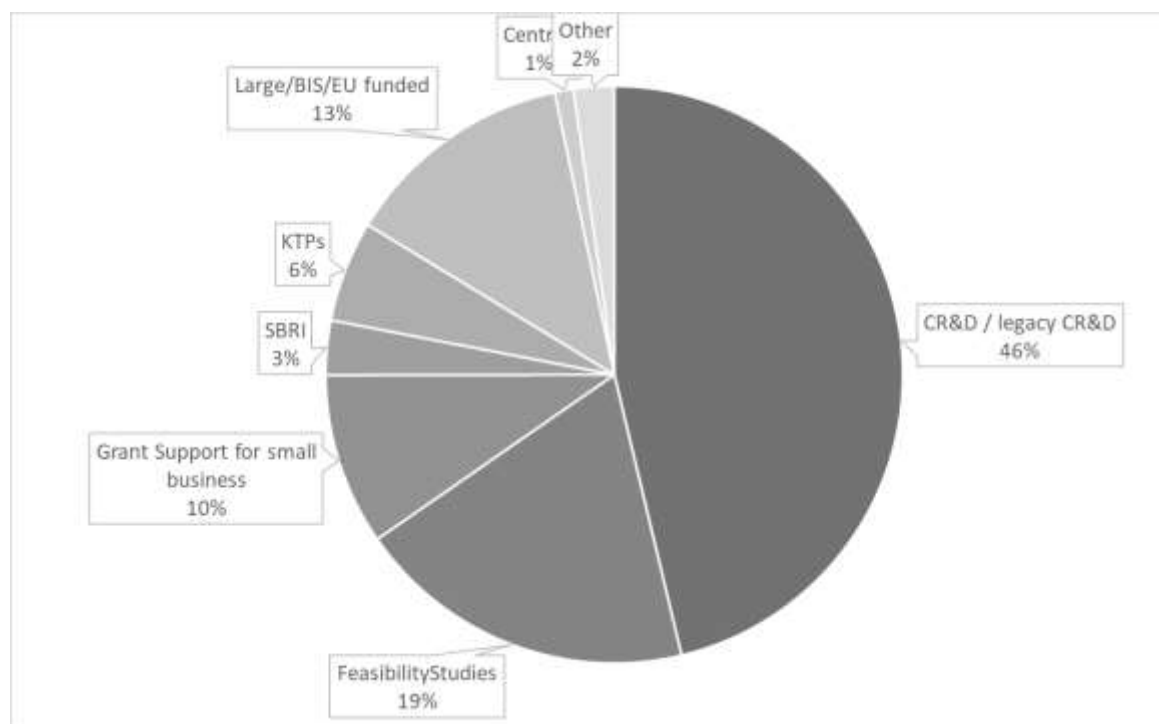
17. The annex explores the gaps for the two LEPs individually. The gap is most pronounced for Cornwall and the Isles of Scilly. While CIOS LEP area secures £10m, were this aligned to the national averages in award value and reflective of the LEP's share of businesses, a further £39m would be awarded to businesses in the LEP. For the Heat of the South West, the funding secured by businesses in the LEP has been £63m and the gap is estimated to be £85m if the LEP was assumed to secure funding in line with its business base and awarded projects of the national average value. The funding allocated to academic bodies – were it awarded based on businesses in the two LEPs – would result in a further £11m to CIOS and £36m to HotSW.

Innovate UK Funding in the two LEPs

18. Over the last decade, Innovate UK has offered many funding products. Some target the smaller sized businesses, such as Innovation Vouchers and Launchpad, and these are usually small amounts for businesses to consider innovation options or seek advice about aspects of R&D. The funding products that are larger often involve a focus on commercialising a product or, where the research focus is significant, collaborating with a university or other research body.

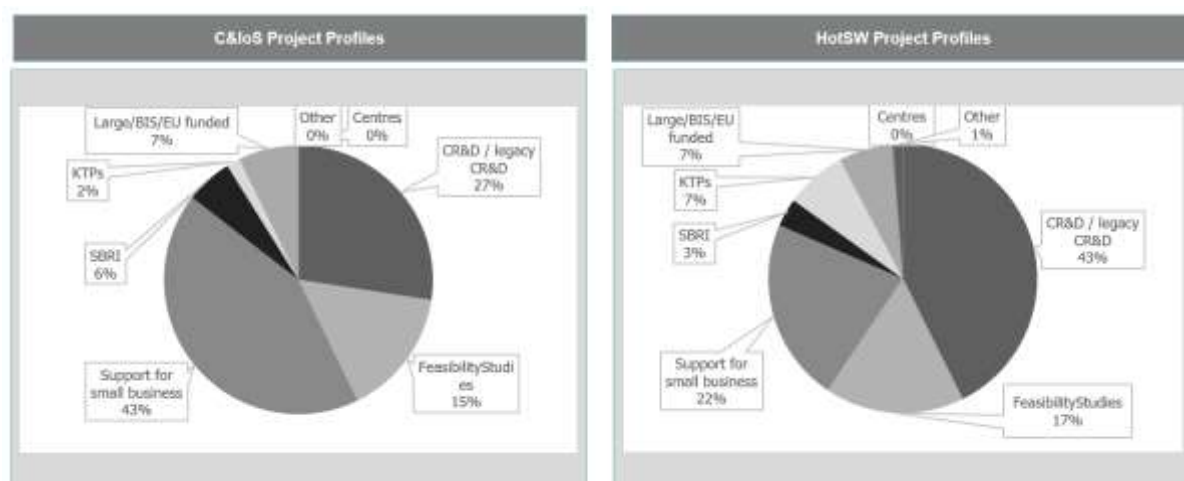
19. The share of the products is provided in Figure 2.4, covering the South West region. It indicates the shares by value. The collaborative R&D projects, which tend to be quite large, dominate the region's allocation. The grants to support small businesses are relatively frequently given but their value is small so that they constitute 10% by product share by value. The second largest product group – Feasibility Studies – tend to be smaller than collaborative R&D but are more frequent.

Figure 2.4: Innovate UK Product Shares in the South West



20. Figure 2.5 presents the share by product types for the 2008- 2017 period in the two LEPs. CIOs contrasts with the profile of the South West region while HotSW looks more similar to the region. Most noticeable is that the CIOs LEP has a far greater share for products supporting small businesses. This reflects regional differences in types of businesses, with larger businesses concentrated in the West of England LEP and, to a lesser extent, in HotSW.

Figure 2.5: Innovate UK Product Shares in the two LEPs



21. The fact that there are fewer research universities in the two LEPs may also contribute to the product share indicated by Figure 2.5. Collaborative Research & Development (CR&D) provides funding for businesses, universities and research and technology organisations to work collaboratively on innovative projects in strategically important areas to tackle specific technical or societal challenges. Two

or more organisations will collaborate and at least one will be a business, typically an SME. This is a more significant funding product regionally, than in the two LEPs. Collaboration with research organisations and universities in particular is discussed in detail in later sections of this report, but the figures point to a likely distance effect, with CloS especially being far from the UK's academic bodies.

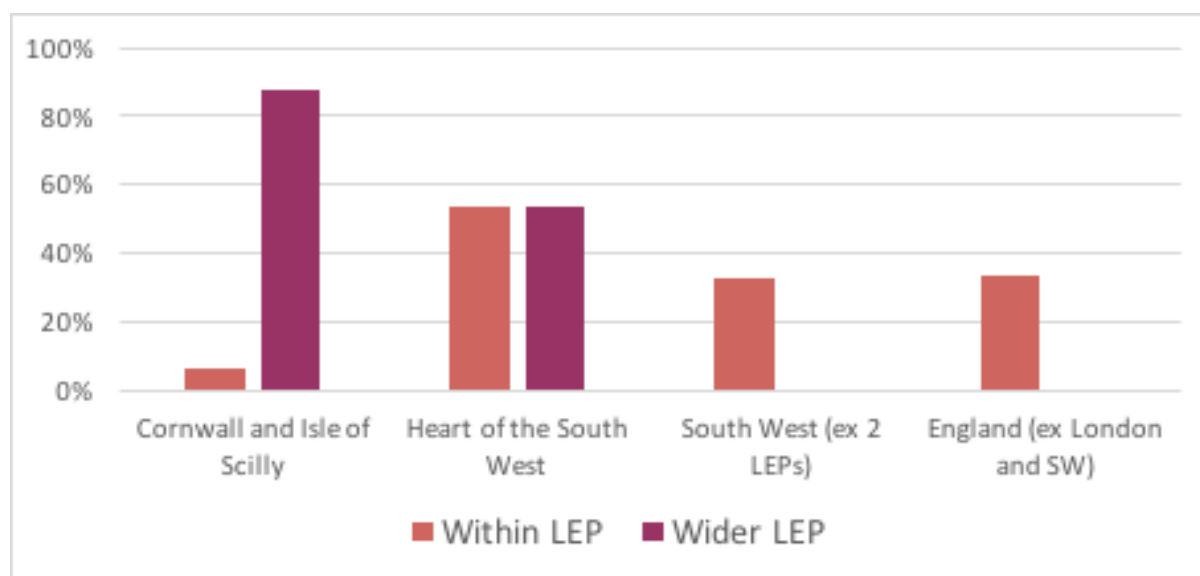
Collaboration and Access to Funding

22. A key structural issue is the relatively low level of research infrastructure in the two LEPs that businesses can access, partly because being a peninsula limits access to Universities and facilities in the rest of the UK. Further, there are fewer large, multinational enterprises in the two LEPs than in other UK innovation centres.

23. Proximity may matter. Figure 2.6 analyses Knowledge Transfer Partnership (KTP) data. A KTP funds a researcher in a university to work in a business part-time, funding this through the research institution. The figure analyses the data by whether businesses are in the same LEP area as the University with which the partnership is made.

24. It corroborates that the peninsula constrains the partnerships to the Universities located in the two LEPs, especially for Cornwall and the Isles of Scilly. For this LEP, while only 5% of KTPs were between companies and universities that in CloS, this rises to nearly 90% when the Universities of Exeter and Plymouth, are included, which both have some presence in the CloS LEP, but have their main address as being in HotSW. This suggests only 10% of University collaboration in Cornwall and Isle of Scilly LEP businesses extend beyond Devon.

Figure 2.6: Indicator of Proximity of University and Company in KTP



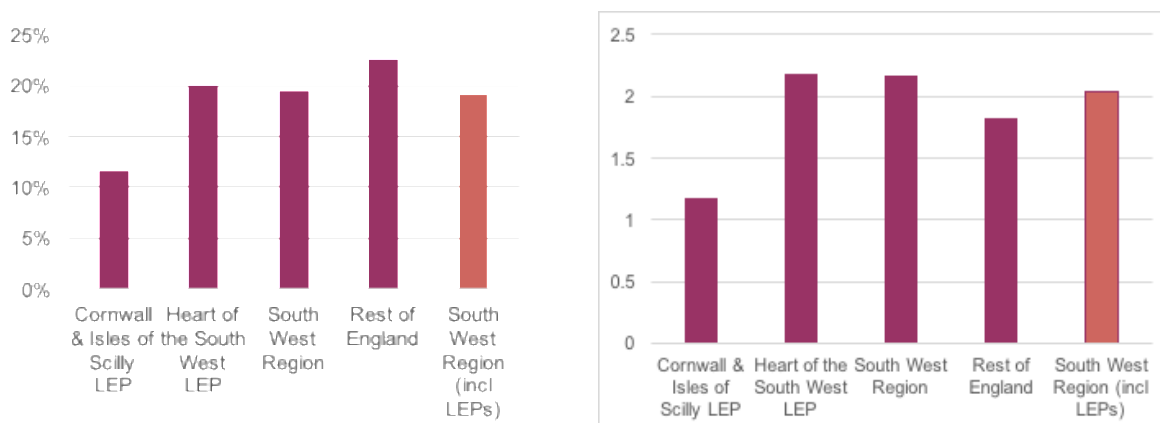
25. The HotSW LEP differs from CIOS in university collaboration having fewer of its businesses collaborating exclusively with universities in the two LEPs. However, its focus on local universities is still higher than the rest of the region and England more generally. The analysis contains 82 businesses for HotSW, of which 44 have KTPs with universities in the two LEPs, with the remaining 38 businesses partnering with universities outside the two LEP areas. Interestingly, of those 38 businesses, 20

are based in the most eastern part of the HotSW LEP area, in Somerset, highlighting geography matters. The businesses in the county have only eight partnerships with universities in the two LEP areas. Somerset being in the east of the two LEPs is least affected by location, with good connectivity with the rest of the south west and other parts of England.

26. Collaborative R&D projects involve multiple businesses, one leading the project. As innovative SMEs collaborate on more advanced R&D, this would often be under the leadership of a large business.

27. Figure 2.7 tracks who leads collaborative projects. The differences between CIOS and HotSW in collaboration across businesses is due to the two LEPs differing in the number of large companies. The figure indicates that collaborative projects in CIOS LEP are less likely to be led by the CIOS collaborator than is the case for HotSW and that the leading of project by Heart of the South West businesses is at a similar level as seen nationally. Businesses such as Leonardo in Somerset have a track record of leading collaborative projects.

Figure 2.7: Share of projects where lead is in LEP and average number of projects per lead in area



Stakeholder Views on the Innovation Funding Landscape

28. For this study, interviews were conducted with businesses and stakeholders involved in innovation funding in the two LEPs. Comments have been anonymised using reference numbering (Ref 1, 2, etc) that does not link to interviewees.

29. Interviewees that managed or supported research funding were shown some of the empirical findings and observed that the scale of funding identified in the Innovate UK database was consistent with their impression for the two LEPs. Many highlighted that regional analysis can be misleading for LEP-level policy making. There was a concern that funding to the South West region did not penetrate beyond Bristol into the two LEP areas, and that the South West might only compare favourably with Innovate UK funding on a regional basis because of the West of England LEP (Ref 26).

30. Firstly, a commonly mentioned strategic feature was the high proportion of SMEs in the two LEPs. Stakeholders involved in supporting innovative businesses

commented that the types of businesses they support reflected this business stock, suggesting that a very high level of the business they dealt with were SMEs (Ref 23).

31. Interviewees also commented on the nature of the SMEs, highlighting that two LEPs were dominated by micro-businesses and SMEs in the “classic sense”. This prompted the question of whether the businesses have the funds or ambition to invest or grow to a scale where they might consider tapping into significant Innovate UK funding for R&D, viewed as requiring some scale (Ref 24).

32. The SME landscape in the two LEPs was further elaborated on by interviewees observing how businesses were often “corporate outposts”, where the business in the LEPs is part of a larger corporate entity. Many such establishments maintain some autonomy from their owners and have access to funding from the corporate centre (Ref 4). They would often need approval from the corporate centre for R&D bids which may be difficult with some preferring to run R&D activities in other parts of the country or abroad (Ref 16).

33. Comparing across the country, one difference was the lack of projects where the lead was a large innovative company, largely reflecting the fact the two LEPs do not host many multinationals. The role of the large company was complex. Innovate UK programmes tend to be focused on individual projects. So, this lack of potential leads in the areas may constrain SMEs. A large business can act as a magnet for innovation, attracting SMEs to collaborative projects (Ref 161) and this was echoed by businesses when they reflected on their early success in receiving Innovate UK funding in collaboration with large customers for their products (Ref 192). Universities can act as gateways for SMEs to large companies and their national research initiatives. The researchers based in a University may work with large companies and then be able to draw local SMEs into these projects with the large companies based outside the two LEPs (Ref 105).

34. There was discussion about possible ways to increase the dialogue between innovative SMEs and the largest companies based in and out of the two LEPs. The recent Strength in Places Fund competition run by Innovate UK was noted as a step in the direction of more strategic investments. A success from the competition has been the building of a consortium of businesses interested in innovation, something that could be built upon in the future regardless of the eventual outcome of the competition (Ref 83).

35. The nature of the companies in the LEP – predominantly SMEs that are geographically dispersed – made transforming ideas into a bid for funding more difficult. A lack of access to the innovative people to share ideas with, as there are fewer clusters of innovation in the LEPs, may cause lower levels of innovation (ref 38). There were suggestions for some form of virtual setting to progress innovative ideas. It would be paralleled by the events, which were an important source of inspiration, responding to the continuing need for support when individuals return to the day-to-day pressures of the workplace (Ref 42).

36. The interviewees considered the relatively low level of funding drawdown in the two LEPs. They cited conventional wisdom as being that the LEPs lack key innovation drivers such as large Universities (Ref 6, 35). SMEs did make applications to Innovate UK motivated by the associated collaboration with Universities and other partners. The high take-up of KTPs in the LEPs may be due to

this product allowing a business without all the technical skills or requiring access to research facilities to tap into Universities. KTP may then be more attractive than project funding but, as KTPs are relatively low value, this limits the size of funding businesses in the LEPs receive (Ref 3).

37. One interviewee observed that the Catapults network stops short of the area. Where the national facilities had taken actions to ameliorate this (e.g. Satellite Applications Catapult's regional centres), the view was that this could provide an opportunity for Innovate UK to explain to SMEs what is available (Ref 153). A concern raised was a perceived low visibility for Innovate UK in such discussions. From a strategic perspective, it was felt that Innovate UK staffing levels in the two LEPs was relatively modest (in comparison to other areas) potentially making a strategic dialogue about Innovate UK funding more difficult (Ref 80).

38. The share of national research funding by Universities in the two LEPs was debated, with many noting that the two LEP areas may not have access to the scale of University research of other areas, limiting both supporting SMEs applying for funding, and making skills and equipment available to an SME's research activities. This was partly due to the geography of the region, being a peninsula. The development of collaborative, long-term relationships between SMEs and facilities or Universities was key to many innovation paths taken by SMEs. Businesses located close to Universities such as in the Exeter Science Park may – it was noted – have strong links with research (Ref 18).

39. Commentators also considered the importance of a Local Industrial Strategy in relation to alternative funding routes beyond Innovate UK. Strategy setting, associated with a funding source, could tailor the support for the high concentration of SMEs. Some funding routes, such as European Regional Development Fund (ERDF) projects, necessitated setting strategic priorities during the setting up of local development funds. Applications to the ERDF – usually led by an organisation or local authority – involve stating priorities as well as constructing performance measures which include support provided to businesses. The resulting Cornwall area's focus on the creative sector and subsectors within creative developed bridges between SMEs, large local, and national anchor bodies and universities (Ref 67).

40. Any strategy setting would need to recognise the high share of SMEs in the areas and some of the identified constraints on the growth potential of businesses in Cornwall and the Isles of Scilly where European funding is allocated due to these needs. Interviewees highlighted targeting those sectors - such as digital - that can operate in a remote part of the country (Ref 68). It would also be important to recognise that an innovation focus may not be the highest priority for the two LEPs. Interviewees highlighted other needs, such as improvements to infrastructure (Ref 82).

Concluding Remarks

41. This chapter has looked at the level of Innovate UK funding in the two LEPs and the South West region. The good performance of the South West is primarily due to the West of England LEP. The two LEPs in the west of the region have a smaller share of the Innovate UK award value. Further, whereas the West of England LEP punches above its weight, with Innovate UK funding greater than the

share of the national business base, the CIOS and HotSW LEPs' shares both fall below their shares of the business base.

42. The funding gap in the two LEPs has been quantified. This is the gap between what each LEP has received 2004-17 and what would have been won had each LEP had beneficiaries in proportion to its business base and had each beneficiary secured the same (and higher) amounts per project that are seen nationally. The gap is most pronounced for Cornwall and the Isles of Scilly. While the LEP area secures £10m, were this aligned to the national averages in average award value and reflective of the LEPs share of businesses, a further £39m would be awarded to businesses in the LEP. For the Heat of the South West, the funding secured by businesses in the LEP has been £63m and the gap is estimated to be £85m.

43. The share of the Innovate UK funding for academic organisations is lower than the share of businesses in the two LEPs. This is because of the presence of relatively few such organisations in the two LEPs. It also causes a funding gap, in that – were this funding to be proportionate to the business base – a further £47m of R&D would occur in the LEPs, £11m in CIOS and £36m in HotSW.

44. The data also indicates some of the reasons for this gap. Firstly, the Cornwall and Isle of Scilly businesses are much more likely to apply for grants targeted at SMEs, something not seen to the same extent in HotSW but nevertheless a feature of both LEPs. These tend to be low value. Further, in both LEPs and more so for CloS, businesses are less likely as other areas to win collaborative R&D and other high value Innovate UK products and less likely to lead these. For CIOS, in such projects, there is lower chance of being the lead collaborator and some evidence that the collaborations are unlikely to look far beyond the local area for collaboration partners.

Issues and Recommendations

45. Interviews with businesses and stakeholders confirmed these empirical findings and then begin to explore next steps in terms of the issues that emerge for the two LEPs in accessing Innovate UK funding.

Issue 2.1: The share of the LEPs in Innovate UK funding appears low due to fewer and smaller projects securing funding than national averages, with this being more pronounced in Cornwall and the Isles of Scilly LEP.

Recommendation: As LEPs develop innovation strategies, the scale of the funding gap can help shape the overall priority to increasing the level of innovation funding. Also, the evidence suggests a focus on encouraging scaling up of the size of projects.

Issue 2.2: There is a need to build on collaboration, deepening the existing links between SMEs, larger businesses and research organisations.

Recommendation: LEPs build on the collaborations developed in applying to recent funding calls (particularly Strength in Places Fund). This would involve Innovate UK to raise the profile of the wider funding opportunities and allow businesses to feed into Innovate UK priority setting.

Issue 2.3: Academic funding for innovation is lower in the two LEPs than would be the case if it was allocated based on business counts (because the two LEPs host few research organisations). There may be value in thinking creatively about how to tackle the lower access to research organisations due to location.

Recommendation: Innovate UK consider options to allow businesses to access (virtually or other means) a greater portion of the UK's research excellence. This may involve events targeting sectors. This might be modelled on the Satellite Application Catapult developing presences in the LEPs or seek to draw into the two LEPs more Universities at events, perhaps building on existing links with the LEPs' businesses

3. SME Experience of Securing Innovation Funding

1. This chapter profiles the businesses that secure Innovate UK support in Cornwall & Isles of Scilly (CIOS) and Heart of the South West (HotSW) LEPs and then explores the SME's pathway through successive funded innovative activities. The evidence includes further analysis of the Innovative UK database, linking the businesses that secure funding to firm-level data about each business. This builds a profile of successful applicant.

2. The chapter first considers the results of quantitative analysis, then turns to the views expressed in the interviews conducted for this study. The interviewees colour in the picture provided by data, outlining both the issues and opportunities that businesses face and some aspects of innovation funding that may be improved. To provide some analytical structure, the next section provides a simple framework to think about the journey of an SME in funding innovative ideas.

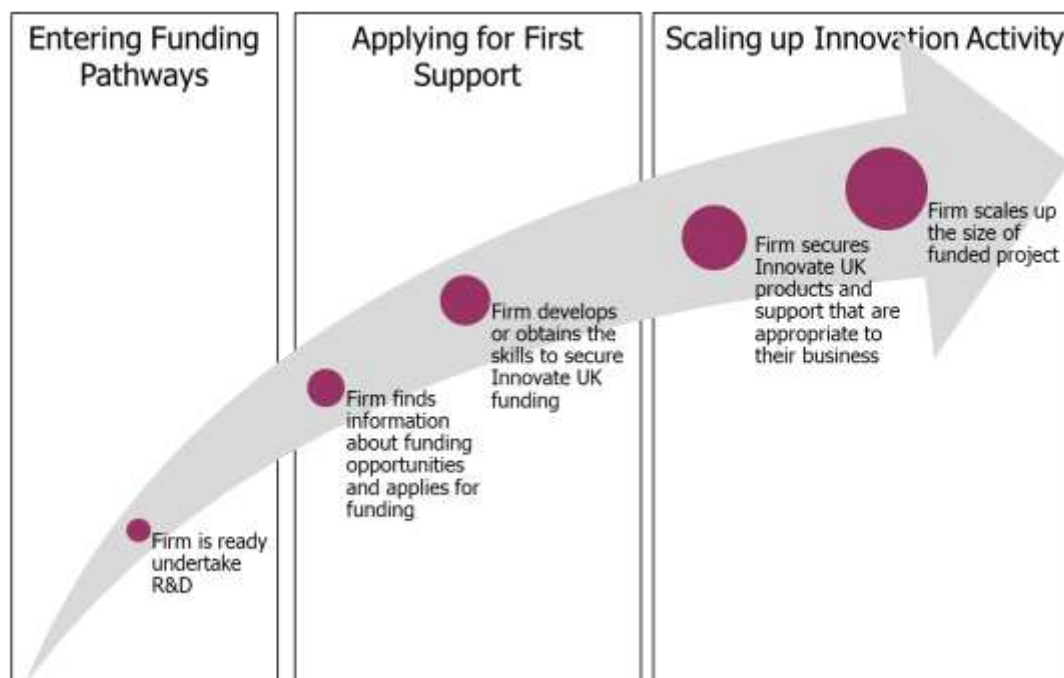
Pathways in Innovation Funding

3. The chapter looks at innovation funding as a pathway, with key steps being presented in Figure 3.1. The pathway can be split into three stages:

- Prior to considering an application, firms need to be ready to apply for innovation funding. Data about innovative activity can indicate readiness but may not reveal whether a business has the capacity and adequate business planning for R&D in place.
- To secure a first strand of innovation funding, firms need to find and apply to grants. This entails finding information about the funding opportunities available, which can occur through multiple entry points, and then developing or securing from others the skills necessary to navigate the application successfully.
- The third set of steps are around ramping up investments in innovation. Evidence indicates that the businesses in the two LEPs appear not to enter into successive innovation funding at the same rate as other areas of the country.

4. The analysis is first quantitative and then – using the interviews with stakeholders and businesses – qualitatively considers the hypotheses regarding possible constraints on businesses in the two LEPs. Broadly, this looks from the SME perspective at whether there are skills constraints, whether the location of the two LEPs reduces the appetite for Innovate UK funding, whether there are gaps in the ecosystem for innovation (such as a lack of large companies, universities etc) and whether there are particular aspects of the process that Innovate UK may need to adapt due to economic factors in the LEPs.

Figure 3.1: Steps in Innovate UK funding



Entering Funding Pathways

5. Innovate UK runs competitions for businesses to secure financial support to invest in ideas. A picture about the types of businesses that apply can be painted using the Innovate UK beneficiary data about the funded projects, where detailed data is published about each successful application. Data linking has been undertaken joining public data about all UK businesses with this beneficiary data allowing profiling of the businesses that do or do not receive funding. This is detailed in the annex.

6. Table 3.1 presents statistics about the businesses and their innovation activity in the two LEPs and other parts of England. The table presents data about the successful applicants and contrasts this with the rest of the business population in the area.

7. The first two indicators are the share of businesses that hold a patent (determined by linking the patent register to the Companies House register) and the share of business that report spending on R&D in their accounts. Estimates for all businesses are presented and the two indicators show the CIOS and HotSW LEPs to contain innovation active businesses at a level comparable to those found in England, though the statistics for the LEPs are lower than those in other parts of the South West region. The table also indicates the share of businesses that – in completing full accounts that are then made available at Companies House – record overseas sales, a further indicator of the profile of business populations.

Table 3.1: Profile of Businesses in the two LEPs, the South West and England

	Cornwall and Isles of Scilly		Heart of the South West		South West (excl CIOs & HotSW LEPs)		England (ex London and SW)	
	Innovate UK Beneficiaries	All businesses	Innovate UK Beneficiaries	All businesses	Innovate UK Beneficiaries	All businesses	Innovate UK Beneficiaries	All businesses
Patent holder	14.3%	0.32%	19.9%	0.37%	20.97%	0.45%	15.8%	0.25%
R&D expenditure reported in accounts	1.2%	0.01%	0.4%	0.03%	1.49%	0.03%	1.2%	0.02%
Exports reported in accounts	7.1%	0.27%	12.9%	0.34%	14.34%	0.49%	12.2%	0.65%
Size proxies								
Businesses not completing full accounts	85.7%	97.9%	74.3%	97.8%	70.9%	97.1%	69.4%	95.2%
>100 employees reported in accounts	3.6%	0.53%	6.2%	0.61%	6.5%	0.84%	8.1%	1.23%
Industry								
Knowledge Intensive Manufacturing (High)	3.6%	0.26%	9.1%	0.26%	7.4%	0.31%	3.7%	0.17%
Knowledge Intensive Manufacturing (High/Medium)	10.7%	0.9%	22.0%	1.0%	15.8%	1.04%	10.9%	0.57%
Knowledge Intensive Services (High)	19.0%	6.3%	17.4%	6.4%	24.1%	13.16%	28.2%	9.77%
Knowledge Intensive Services (High/Medium)	23.8%	13.0%	29.9%	12.8%	37.8%	19.8%	39.8%	15.6%
Agritech - Narrow Definition	7.1%	2.4%	14.1%	2.4%	11.6%	2.4%	10.5%	2.1%
Agritech - Broad Definition	7.1%	3.5%	18.3%	3.2%	14.5%	2.8%	13.5%	2.6%

High KI manufacturing is SIC 21, 26, 30.3; medium/high KI is 20-21, 25.4, 26-29, 30 [excl. 30.1], 31.5; High KI services are SIC 59-63, 72; medium KI are 58-63, 71-72, 74.9. For Agritech, 3 -digit SICs are, 202, 283, 712; 4-digit: 164, 2015, 2651, 2222, 8292; 5-digit 74909 for narrow definition; 3-digit: 99-130 added for broad definition. See annex for details.

8. Table 3.1 then considers other indicators, looking at size and industry proxies, that may correlate with successfully applying for Innovate UK. A key feature of the two LEPs and the South West region more generally is the relatively high share of manufacturing businesses and lower share of services compared to the rest of England, especially focusing on industries that are knowledge intensity (using knowledge intensity defined in SQW, 2013).

9. The table also indicates that, looking at the England data, successful applications are high in businesses that are large: these are companies reporting more than 100 employees in at least a year of their last five full accounts. In both LEPs, there are fewer large businesses and more SMEs.

10. Unsurprisingly, across these indicators, the successful applicants for Innovate UK funding are different to the population of businesses found in the area. The supported businesses are many times more likely to hold a patent, report exports and R&D. They are also much more likely to be in knowledge intensive industries than the wider business population. The successful applicants are also larger.

11. In analysing the profile of businesses in the two LEPs, there are some characteristics suggesting there would be a high level of innovative businesses in CIOs and HotSW. In both LEPs, there are more businesses in manufacturing sectors intensive in their use of knowledge. These businesses have a high propensity to receive Innovate UK funding, higher than knowledge intensive services, where the two LEPs have a lower share of businesses than is the case nationally. This industrial structure also means that indicators of innovation activity – such as holding a patent – are not relatively high in the two LEPs. However, the two LEPs are also home to few large businesses and the number of small businesses is high. This would tend to lessen the chance of successfully receiving Innovate UK funding.

Applying for First Support

12. Businesses that embark on research and development differ from the wider business population. Statistics about the successful Innovate UK applicants highlights a few key characteristics. These can be used to profile both the businesses that have secured funding and, as the profiling is possible for all businesses, to highlight the businesses that are yet to successfully apply to Innovate UK but are like the beneficiaries and so may be ready to apply for first support.

13. To identify the businesses that might be ready to apply, a first stage explores the correlation between the characteristics of businesses and making successful applications. A statistical model is used to determine the chance of successfully receiving support, conditional on business characteristics. This can also model the marginal improvement in this chance as a business characteristic changes, such as holding a patent. The annex provides details of the analysis but some findings are:

- The data can explain the chance of being a successful applicant well
- The characteristics that correlate positively with Innovate UK funding are: holding a patent, followed by the reporting of exports and R&D activity
- However, being characterised as a small business, common in the two LEPs, reduces the chance of being an Innovate UK beneficiary.

14. These correlates do not reflect causality and – as Innovate UK is funding R&D which often results in patenting or reporting R&D expenditure – the causality may run the opposite way. However, successful businesses can provide a benchmark in terms of the importance of the different characteristics in successfully applying for funding. Such analysis can be used to identify businesses that could secure funding but have not, using profiling.

15. Table 3.2 shows six profiles, based on whether the firm owns a patent or reports exports or R&D. The annex indicates how these characteristics – alongside a business’ industry and size – are strongly correlated with receiving Innovate UK funding.

16. The table indicates that there are four businesses, all in the Heart of the South West that have all three characteristics, in holding a patent, reporting overseas sales and R&D (profile A). The firm-level data can then look at whether such businesses are in receipt of Innovate UK funding or nor. Of the four businesses in profile A, a single business is also a beneficiary of Innovate UK support. This suggests that there may be three businesses that could be encouraged to consider Innovate UK support.

17. The table indicates that there are two profiles of businesses which have many businesses that could be targeted. Of the 41 businesses in the two LEPs that hold a patent and report export sales, there are 22 businesses that do not appear in the Innovate UK beneficiaries list. The table further indicates over 200 businesses that hold a patent but are not Innovate UK beneficiaries.

Table 3.2: Profiling Innovative Businesses

Profile type	A	B	C	D	E	F
Businesses profiled as...						
Holding a patent	Yes	Yes	Yes	Yes	No	No
Reporting R&D in accounts	Yes	No	Yes	No	Yes	Yes
Reporting exports in accounts	Yes	Yes	No	No	Yes	No
Businesses with profiles in two LEPs						
Total across both LEPs	4	41	1	259	12	3
Cornwall & Isles of Scilly	0	5	1	53	1	0
Heart of the Southwest	4	36	0	206	11	3
Successful Applicants with profiles in two LEPs						
Total across both LEPs	1	19	0	40	1	0
Cornwall & Isles of Scilly	0	2	0	10	1	0
Heart of the Southwest	1	17	0	30	0	0

18. Table 3.2 merely summarises a list of businesses, profiled as potential future Innovate UK beneficiaries. The statistical work suggests that this profiling is relatively robust, able to correlate funding success with the characteristics used to profile the businesses. Key will be to explore whether the understanding provided by the public data can then be used to encourage businesses towards applying for Innovate UK support, but doing this in a targeted manner.

Scaling up and Clustering of Innovation

Successive funding bids in the two LEPs

19. Having secured first funding, businesses may scale up their operations, undertake further innovation, and apply for more funding. This section considers the experience of businesses at this stage of the innovation journey.

20. The Innovate UK data allows analysis by individual companies, tracking their securing of Innovate UK funding. There are different ways to define the transitions in successive funding incidences but the analysis below indicates businesses in the two LEPs are less likely to transition from starter products provided by Innovate UK (defined as Vouchers, SBRI, Smart and KTPs predominantly) to the larger funding products, primarily collaborative R&D and large project investments.

21. In England, excluding London and the South West region, there were 1,171 transitions where the businesses in their first award received a starter product. When the businesses next award was categorised, 630 had received one of the larger support products (i.e. 541 received two starter products in a row). This means that 54% of businesses in England scaled up from a starter product to a larger Innovate UK investment. In the South West excluding the two LEPs, the rate is very similar at 53%. However, the two LEPs have a much lower scale up rate at 42%.

Figure 3.3: Scaling up Innovation Funding

England excluding South West and London	There were 1,171 transitions from starter Innovate UK products of which 630 scaled up (54%) .
HotSW and CloS	There were 52 transitions from starter Innovate UK products of which 22 scaled up (42%) .
South West Region excluding HotSW and CloS	There were 101 transitions from starter Innovate UK products of which 54 scaled up (53%) .

22. The profiling of businesses that was presented earlier focused on businesses that have not successfully applied for Innovate UK funding. This might be complemented by looking at the businesses that did secure a first funding but appear not to then continue with applications and – more importantly – increase the scale of funding sought and projects pursued. This would target a relatively small number of business and focusing on scaling up an SME’s innovation projects.

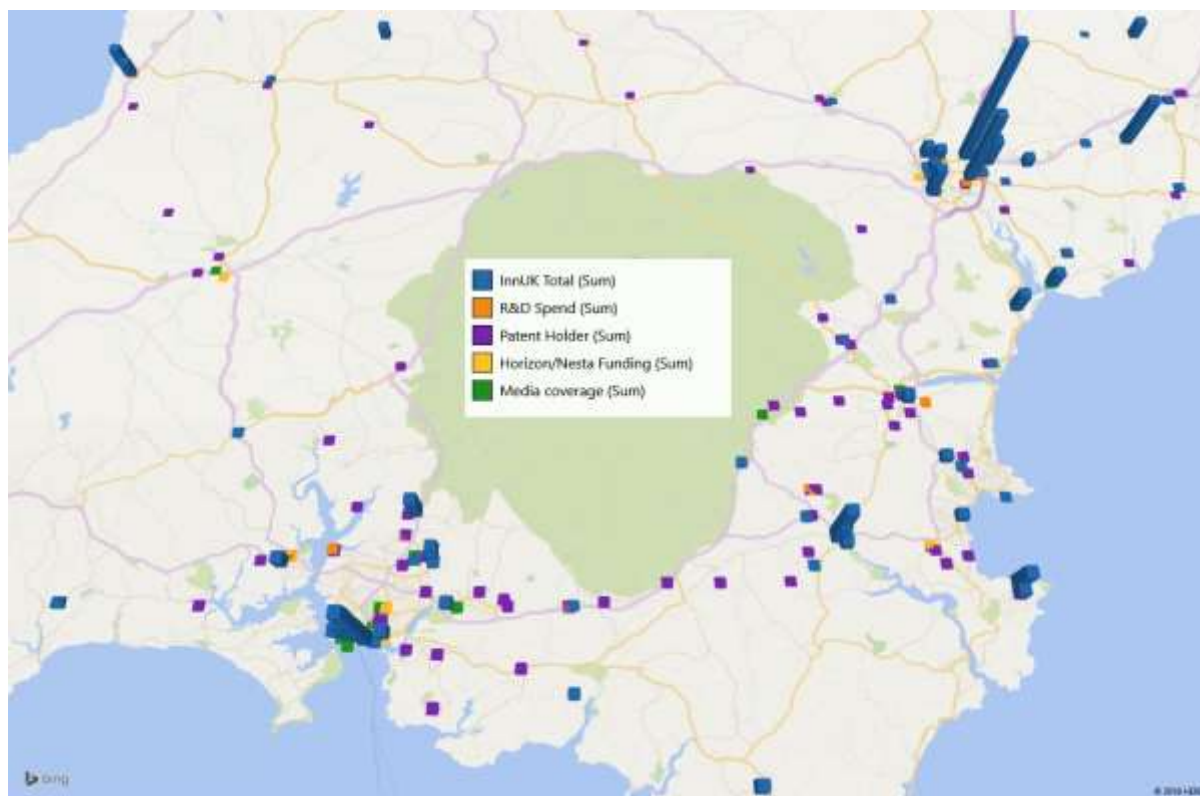
Mapping Innovation in the two LEPs

23. As the business lists include postcodes, innovation funding and the innovation profile of businesses can be mapped (Figure 3.4 – Figure 3.6). Each point or column

is an individual location. The columns represent the Innovate UK beneficiaries with the height scaled by the total funding received through supported projects. It excludes any KTP funding (which is usually allocated to the University partner). Most columns reflect a single business receiving several projects. However, at some postcodes, there may be more than one funded business.

24. The businesses profiled as innovative but that did not receive Innovate UK funding are mapped as points. Large businesses that provide full accounts where they report R&D are coloured orange. The businesses that own a patent are blue. Those in receipt of funding from EU Horizon 2020 or Nesta are red. The map also indicates some businesses, reported by media in the areas as innovation leaders, coloured yellow. (This profiling variable was local to the two LEPs and so not used in Table 3.1).

Figure 3.4: Innovate UK funding in Devon



25. Figure 3.4 indicates the innovation clusters in urban areas such as Exeter and Plymouth. The corridor that joins the two centres can also be highlighted, with the A38 and roads off this having several patent-owning businesses, indicating R&D activity. On the north coast, there is a cluster of funding recipients with three businesses each having about five awards.

26. Figure 3.5 focuses on the businesses in Exeter, mapping funded business and those profiled as innovative but not in receipt of funding. The figure highlights an issue with the dataset, with the largest column being that of a business which has a registered address different to its operating address (which is on about 5 miles out of the city on the A38 towards Plymouth). However, generally, manual checks of the

postcodes find this to be an infrequent issue for the largest Innovate UK supported businesses. For example, the second largest column is for funded projects in waste management located at the registered address.

27. The businesses in the east, near the motorway, include those in Exeter Science park on the east of the M5. The map shows the businesses to be funded by Innovate UK with relatively fewer business profiled as innovative but not in receipt of funding. Near the University – on the left top of the figure – there is less funding but many innovative businesses.

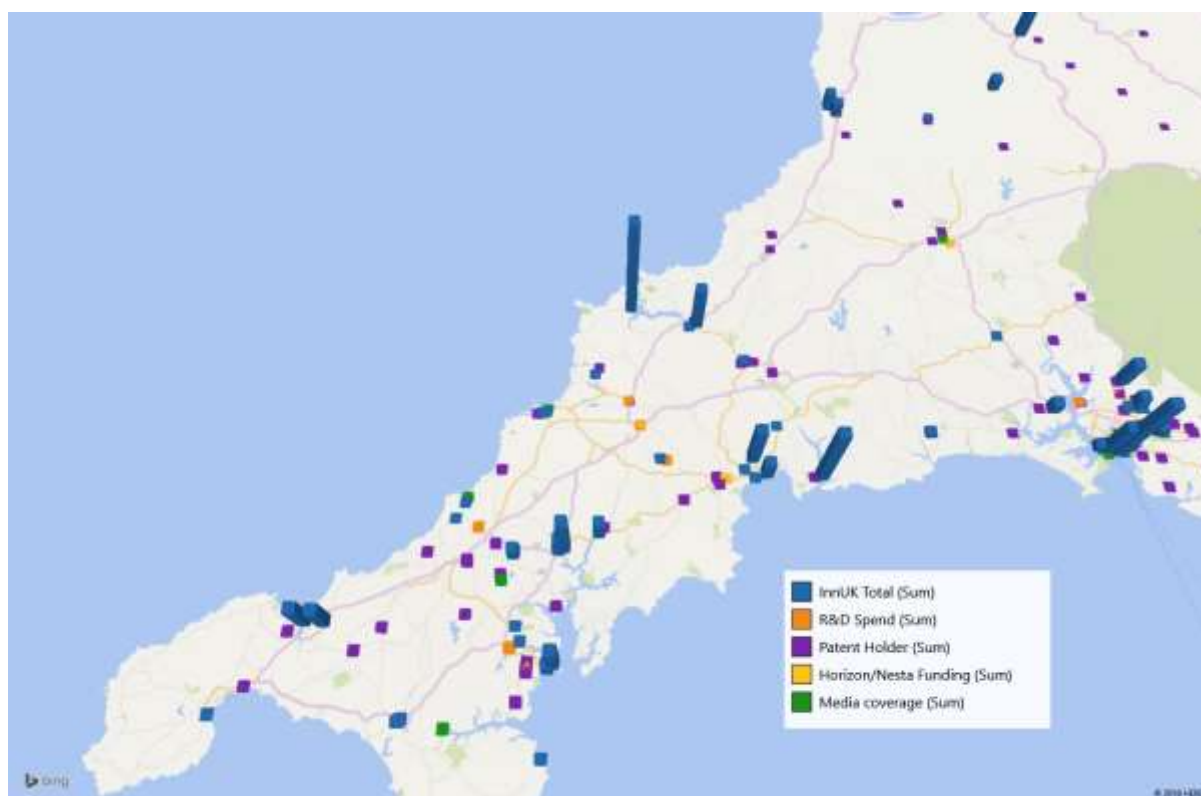
Figure 3.5: Innovate UK funding near Exeter



28. Innovative businesses clustering around Universities is a feature of the Cornwall/Devon maps (Figure 3.6). Mapping businesses in science parks in Plymouth indicates a high density of businesses with the profile to be applicants for Innovate UK. Some companies partner with neighbouring Universities either using Innovate UK funding for KTPs or through the start-ups having working relationships with academics in the Universities.

29. The maps were tested with stakeholders asking about the geography of innovative businesses and discussion indicated a range of informal networks and broadly appeared correct. Perhaps most significant in the discussions was the differences in availability of funds in the CloS area, in comparison to the HotSW.

Figure 3.6: Innovate UK funding in Cornwall/West Devon

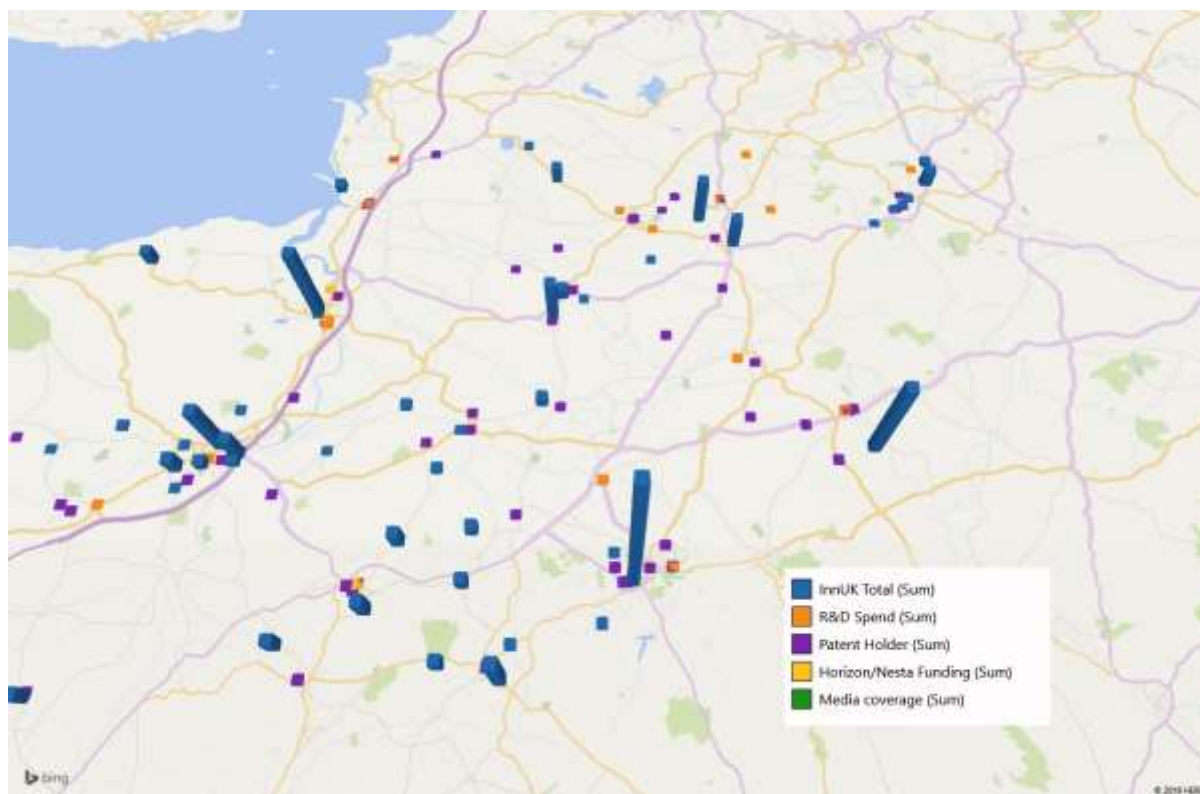


Large Anchor Companies

30. There was a good understanding of the large companies based in the two LEPs and why each may be constrained in driving innovation activity in the two LEPs. Some good examples were noted, and it was observed that Somerset had some clusters around large innovative companies. Yeovil was also recognised as a centre of excellence in aerospace with Leonardo Helicopters at its core. Figure 3.7 centres on this clustering, with the largest column reflecting the substantial funding from Innovate UK to Leonardo’s Yeovil plant. Along the M5, Taunton is home to several companies that have received significant funding, with a clustering of innovative businesses in the town and along the motorway north to Bridgewater.

31. There was a recognition of the clusters mapped in interviews, with the added observation that there were also innovative businesses in more isolated areas. However, there was a concern that geographical isolation limited networking and the benefits from clustering. This may result in a lack of peer-to-peer innovation, and less understanding of the background to Innovate UK competitions.

Figure 3.7: Innovate UK funding in Somerset



Stakeholder views on the Innovation Funding Journey

32. Ash Futures and SW Growth Service (2017) find that “most of the resources are already available in the region but businesses may not know where to turn” (pg. 4). The empirical findings about the innovation pathways taken by SMEs were discussed with stakeholders and businesses, as well as specific questions about the reasons why businesses have sought innovation funding, the constraints faced and testing the hypothesis around the performance seen in the two LEPs. Comments have been anonymised using reference numbering (Ref 1, 2, etc) that does not link to interviewees. This section describes findings.

Profiling Businesses as Innovation Ready

33. Interviews highlighted that profiling was being used by those involved in supporting business innovation. Profiling included considering whether a business has an R&D budget and the size of the business. However, such profiling was often augmented by the behaviours of the businesses. Broadly, profiling might be improved by considering whether:

- Businesses have an active and planned R&D budget on focused development needs (Ref 5, 28) linked to the strategy of the business including to fund interesting and emerging technologies for significant innovations (Ref 8, 45).
- Businesses invest in long-term relationships with Universities and researchers and view it as important to find resources to develop products, usually within the product cycle (Ref 110).

34. There were also negative behaviours that might be considered as advice was tailored for an individual business:

- The strategic intent of an SME was to remain small, consistent with the lifestyle of the business owner. Even where there was an innovation aim, this may be immature, failing to move beyond a smart idea to thinking about the customer journey, the next ideas and long-term aspects (Ref 41).
- R&D may be less of a priority than the focus on new machinery or other efficiency-raising investments with quick return (Ref 7).
- Infrequency of innovation activity may mean businesses – though undertaking activity with vigour – do not undertake it as well as possible (Ref 7).

35. Profiling whether a business may be ready to embark on innovation was complemented by the programmes available to encourage strategy development. Interviewees highlighted that an application for funding may be a lever to get companies to think about innovation in terms of the wider business strategy (Ref 9). It is also important to distinguish businesses that see funding as part of an innovation journey from those that are applying for funding in general (Ref 36). Some specific programmes were noted, such as the Oxford Innovation Transform Programme, SetSquared and Innovate2Succeed.

36. The programmes identified gaps in an SME's capability and what support is out there, including to understand customer needs, and to have access to research, contacts, collaborations and partnerships. Businesses may need to access R&D skills or equipment to perform research. Historically, they might have looked within the company and supply chain to solve problems (Ref 27, 29). However, businesses increasingly saw a need to draw on the Universities' expertise, especially in cutting edge technologies (Ref 44). Companies formed good, multi-faceted relationships with nearby Universities. The relationships were with like-minded people to consider R&D potential ideas, attend events and from whom to recruit skilled people (Ref 47).

37. Research facilities, recognising that SMEs need to familiarise themselves with equipment, have developed and secured funding for businesses to take the first steps. This includes experience-sharing events and a funded programme for businesses to try the equipment, targeted at SMEs as larger businesses are expected to use facilities on a commercial basis (Ref 56).

Finding out about Innovation Funding

38. Interviews considered various aspects to first applications for funding. There was a need to prioritise and customise information, so that Growth Hubs and other information providers focused or targeted their advice, aligning this to the strategy of the LEP. Information could include roadmaps about timing of upcoming competitions allowing businesses to plan (Ref 38). Interviewees found that some past support measures, such as Innovation Vouchers, that targeted first steps on R&D were good for direction setting for innovative SMEs (Ref 149). Improved routing through advice could be linked to the profile of a business, e.g. a software business of a certain size, directing the user to suitable funding opportunities (Ref 20). This may also lessen the routing of businesses to innovation funding who were seeking business support unrelated to innovation (Ref 79).

39. Broadly, the profiling evidence used in this chapter could be the basis for some targeting, but would need to be associated with specific measures:

- Use sector specific events perhaps at facilities to link SMEs with the customers for an SME's innovation. There were successes here, such as examples where large companies from outside the areas being brought into the LEPs for this (Ref 100). This may address businesses' difficulties attending information-sharing events organised by Innovate UK which tended to be in large cities away from the LEP areas
- Promote technologies for Innovate UK competitions (e.g. autonomy in transport) refining these in dialogue between SMEs and customers allowing customers to state what they want in terms of what is possible. An example in defence was MOD's Bristol-based procurement organisation involving SMEs in technology-related deep-dives with MOD project teams, which can shape the funding calls (Ref 49).

40. Many noted that – alongside their role in collaboration in applications to innovation funding opportunities – Universities were good at signposting, prompting businesses with which they engage about opportunities. Many saw the KTPs as able to unlock this potential, developing partnerships between businesses and universities that subsequently can support applications to larger funding (Ref 20, 51).

41. However, businesses also observed a different side to this: that there may be multiple government bodies for innovation. Sometimes it was the LEP; sometimes Innovate UK. Also, this changed over time, with the previous organisational structures that Innovate UK replaced. This was contrasted with the relative stability of University or research facilities, both in their focus and staff, making them an important strategic partner for businesses in innovation (Ref 99). In Cornwall and Isles of Scilly, there was perceived to be alternative funding sources, both for activities in innovation and outside innovation, often through ERDF funded projects. Applications were more likely to be successful to these CIOS specific funding streams but there was a concern that they would not be joined up adequately with Innovate UK competitions (Ref 76, 104).

Application Processes

42. A much-cited constraint is in the application process requiring the skills and time for proposal writing (Ref 51, Ref 57). Proposal writing was often in private time by the managing director and the process was equivalent to the winning of a contract (Ref 17, 51, 58). SMEs felt disadvantaged as there was a perception that larger firms could dedicate targeted resource to this (Ref 130).

43. University partners can contribute to bid writing, specifically with a first draft or guiding SMEs that are new to the process (Ref 59, Ref 123). Also, the University-business KTP was less administratively burdensome and with a better chance of a success. This was attractive to SMEs working with universities. Innovation Vouchers was also an example of funding that had an accessible application process (Ref 149). A second example was R&D tax credits, which were easy to navigate for SMEs. Businesses receive the credit if conditions are met after the R&D and was preferred by some businesses to applying for grants that required an applicant to forecast their research outcomes (Ref 79; Ref 130).

44. There was a general appreciation that SME's get better at developing good applications, making success more likely with each bid (Ref 46). The process of thinking and planning for the innovation activity that funding applications require adds value to the business. Interviewees involved in advising businesses about funding across different sources (equity, venture capital) saw the Innovate UK application as asking the right questions (Ref 107).

45. Also, during an application, various collaborative aspects can be explored. SME's begin to plan with their customer what needs to be done, something that can help them become internally efficient (Ref 40). It was important to have a good fit with the partner academic (Ref 103, Ref 132). Due to the distances involved, SMEs may focus on working with researchers in the two LEPs. However, research organisation more aligned with the business priorities may lie further afield. General issues of working with research organisations were also noted, such as the academic partner needing publications as outputs perhaps distracting from commercial outputs or – where the research organisation oversees an innovation programme – engaging with SMEs to meet specifics contracted objectives rather than as part of a research endeavour (Ref 104, 130, 133).

46. An aspect of the competition process highlighted was that guidance about what judging panels are looking for would be valuable. Businesses looked at the feedback they received on unsuccessful applications and felt winning would result by describing the proposal differently but with the same basic idea (Ref 40, 48, 50). Interviewers felt there was also an element of ticking boxes (Ref 118).

Reluctance to Scale up

47. A finding from the data analysis is that the SMEs appear less likely to bid for successive Innovate UK projects and for these bids to increase in scale. Interviewees, recognising that the average funded amounts bid for by businesses in the two LEPs was small, saw the to the small size of the businesses in the LEP and a natural cautiousness as a key reason (Ref 61, 66). However, there was a perception there was a greater depth to partnerships in other LEPs and that these areas were more engaged with Innovate UK funding (Ref 103).

48. The type of personnel engaging in the projects was important. For example, SME staff using research facilities are engineers or R&D teams rather than Managing Directors. As the Managing Director tend to have more limited exposure this may be impeding conversations around strategy and R&D that would take place if the engagement took place also at a more strategic level (Ref 61).

49. Many interviewees had sought innovation funding as much to access technical skills as for the financial support. While Innovate UK project funding was an option, maintaining a commercial interaction with Universities drawing on KTP funding was often satisfactory for all. SMEs had recruited graduates into the company's R&D teams from the University and saw innovation funding as a means to build on the skills base that this brought (Ref 43).

50. SMEs did not see applying for a large project grant as vital in the final stages of the research process, as products were developed, which the funding was often seeking to support (Ref 55). Businesses were often able to fund any important R&D, finding other ways to fund (Ref 35): there were privately owned companies with a

track record of private venture money before seeking Innovate UK KTP funding. Further, businesses that were partly owned by a larger company could look to that organisation.

51. An alternative model to increase interest in innovation finance for large projects was offered in schemes that offer entrepreneur training, incubation and acceleration with various support measures for graduate spin-out businesses. Here the research institution provided important connections with large prime businesses and, through them, provide entrepreneurs with ideas and technical resources (Ref 63). This would lead the entrepreneurs to consider Innovate UK funding, but also has wider implications as commercialisation managers in the incubation team broker relationships between entrepreneurs and private investors. Examples were derived from relatively few years of experience but there was an expectation that the businesses coming out might consider the Innovate UK type funds (Ref 64).

52. Paralleling incubation, to provide interaction between SMEs and large innovative businesses in the two LEPs, a university invites large companies to allow SMEs to distribute/test on their platforms. SMEs are tasked with the parts of larger product development. (Ref 70). Further, those involved in investment advice for SMEs saw it as part of their role to connect the SMEs with large businesses in their sector observing that many – if interested in an innovative SME in the LEPs – could invest in R&D. Such work was often facilitated by Universities, with Exeter University noted as having strong links with multinational, innovative businesses in several sectors (Ref 105). Falmouth University's entrepreneurship Launchpad has also provided links between large businesses and the start-ups being incubated at the University.

Concluding Remarks

53. The profile of businesses in the two LEPs suggests there would be a high level of innovative businesses in CIOS and HotSW, but that this would be reduced as the two LEPs are also home to relatively few large businesses and the number of small businesses is high. In both LEPs, there are more businesses in manufacturing sectors intensive in their use of knowledge. These businesses have a high propensity to receive Innovate UK funding, higher than knowledge intensive services, where the two LEPs have a lower share of businesses than is the case nationally.

54. Firm-level data has been linked to the beneficiary data and profiling used to identify businesses in the two LEPs that have characteristics that correlate with securing Innovate UK funding but do not appear on the beneficiary data. There are two profiles of businesses which have many businesses that could be targeted/encouraged for Innovate UK funding. Of the 41 businesses in the two LEPs that hold a patent and report export sales, there are 22 businesses that do not appear in the Innovate UK beneficiaries list. Over 200 businesses that hold a patent but are not Innovate UK beneficiaries.

55. The Innovate UK data allows analysis by individual companies, tracking their securing of Innovate UK funding. There are different ways to define the transitions in successive funding incidences, but the analysis indicates businesses in the two LEPs are less likely to transition from starter products provided by Innovate UK

(defined as Vouchers, SBRI, Smart and KTPs predominantly) to the larger funding products, primarily collaborative R&D and large project investments.

56. Businesses have been mapped, focusing on those that secured Innovate UK funding and the businesses profiled as innovative using the firm-level data but not in receipt of Innovate UK funding. This indicates that there is some clustering of innovative businesses. Around universities, there are few large beneficiaries of Innovate UK funding but businesses that are identified as innovative. A second form of clustering is that around the plants of large, multinational companies, which themselves tend to be significant beneficiaries of Innovate UK funding. Outside these clusters, there is a spread of innovative businesses.

Issues and Recommendations

57. Interviews with businesses and stakeholders explored next steps in terms of the issues that emerge for the two LEPs in accessing Innovate UK funding.

Issue 3.1: Profiling using the public data provides a start for any organisations advising businesses about innovation funding and this can then be tailored by advisory bodies.

Recommendation: LEPs/Innovate UK encourage Growth Hubs and other business support bodies to use public data. These would identify businesses that are innovation active but not seeking support, or businesses that have received starter products from Innovate UK and may be able to move to further investments. These can be enhanced in formal interactions (such as the Innovate2Succeed scheme) and augmented by other datasets about business support.

Issue 3.2: Innovative SMEs see making a strong bid for funding as difficult, requiring skills that they may not possess

Recommendation: LEPs with Innovate UK provide support for bid writing. This could involve specific SME support, or workshops and sector specific events. Key would be content about making a persuasive bid and filtering the SME's application.

Issue 3.3: Innovate UK can appear distant from the SMEs in the LEPs. This may be linked to the relative paucity of research infrastructure (Catapults etc) in the two LEPs.

Recommendation: Innovate UK may review how they can routinely engage with SMEs as they shape funding priorities. The good practice highlighted included having theme specific events mixing SMEs with research customers (as used by MOD for defence), events at facilities or incubators.

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Annex: Analysis Approach

Innovate UK Support Data

1. Innovate UK invested over £2.4b in more than 20,000 innovation projects since 2004. A dataset listing the funded projects is published as part of the Innovate UK's routine releases, with the 2018 dataset underpinning this report's analysis. The data goes back to projects started in 2004, with the largest focus and amount of spend being since 2009 onwards. This is when the consolidation of different datasets was most co-ordinated, so earlier years reflect a useful, but somewhat partial, picture of the funding made available. Where the funded project involves a registered business, the dataset contains the Companies House number.

2. The data in the Innovate UK database contains the Knowledge Transfer Partnerships (KTP). However, as the prime beneficiary of the KTP is the university, with the business partner then being an indirect beneficiary, the records for KTP projects records the university in the Innovate UK support database.

3. A further public database is available which then includes both the university and the partner business in a KTP. This does not contain a Companies House number with only the name of the company provided. A matching exercise was conducted linking the businesses listed to the Companies House registers of various years (so that businesses that received KTP but subsequently filed for deregistration from the Companies House register), provided an alternative dataset about KTPs.

4. Where businesses have a Company House registration number, this allows entries to be linked to the register. This then allows a few key variables to be added to the data, particularly the registered address, the industrial classification and the date the business was registered. Further variables, such as the Local Enterprise Partnership of the registered address can also be added by linking to ONS postcode look-ups.

Strategic Analysis of Innovate UK Funding Secured by LEPs

5. In Chapter 2, the funding received in the two LEPs was analysed and then adjusted using various uplifts for the higher rates of take-up by companies across the country. The gap analysis focuses first on non-academic, business beneficiaries. This is done to address the small number of universities in the region, and so understand the gaps in funding from the perspective of the businesses in the two LEPS, and get a more representative view of how grant allocation to businesses compares with other regions.

6. So, firstly, academic beneficiaries had to be identified. This was done using IUK's own definition. The database was filtered on 'Academic', a designation input by Innovate UK. To check whether this was an appropriate proxy for University/HEI beneficiaries a university variable was set up, coding all beneficiaries with names

including the words University, College, and School as universities. The relationship between 'Academic' and 'University' was checked.

7. The funding secured by the region/LEP – excluding academic beneficiaries – was identified. For example, the South West received £818m grant for 2,630 projects, accounting for 13% and 9% of the national totals for grant and projects respectively. Removing academic beneficiaries this is adjusted to £700m (14%) and 2,162 (9%).

8. To see what the region or LEP would have received if grant size aligned with the national average, the number of funded projects were multiplied by the national average grant value. The 2,162 awards in the South West was multiplied by the mean award size of funded projects (£216k per award when excluding academic beneficiaries¹).

9. Since awards are made to businesses the calculation also needs to adjust for the business base, which provides the pool of potential beneficiaries. ONS data was obtained on Business Counts and the population as the share of the national population was obtained for the region or LEP. To make this comparable with IUK data, the proportion is calculated as a percentage of business base nationally, including Wales, Scotland and Northern Ireland.

10. The award allocated to the region/LEP is compared to what we would expect given average award-size and number businesses. If allocation in the South West represented the 9% share of businesses nationally, and was in line with the national average, the region would secure 9% of the 23,835 awards (2,069). If each award was made in line with the mean award size this will equal £447m for the region. This 'expected' value is then compared against the actual award received by non-academic beneficiaries in the region, indicating the shortfall or over performance.

11. Finally, the proportion of the funding gap related to the academic beneficiaries is estimated. This is done comparing the amount received by non-academic beneficiaries to that received by academic beneficiaries. The expected level is then simply the share of academic funding had this been proportionate to the business funding.

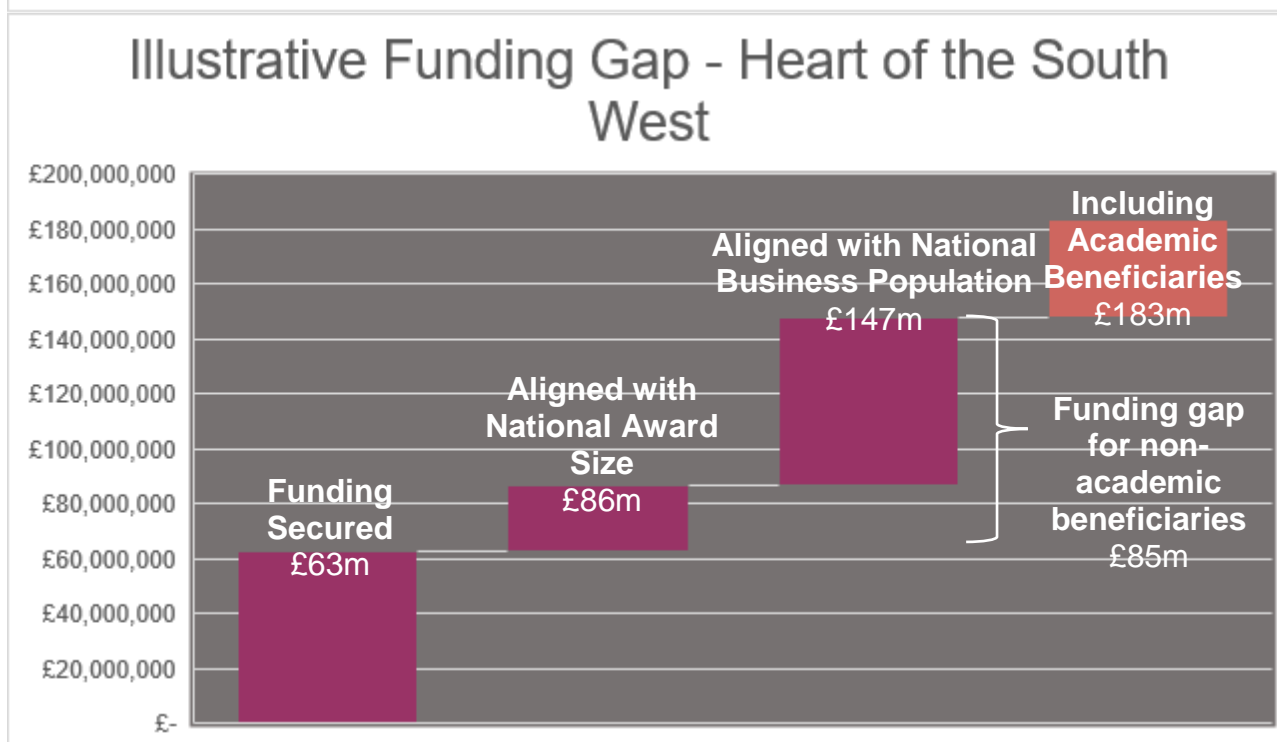
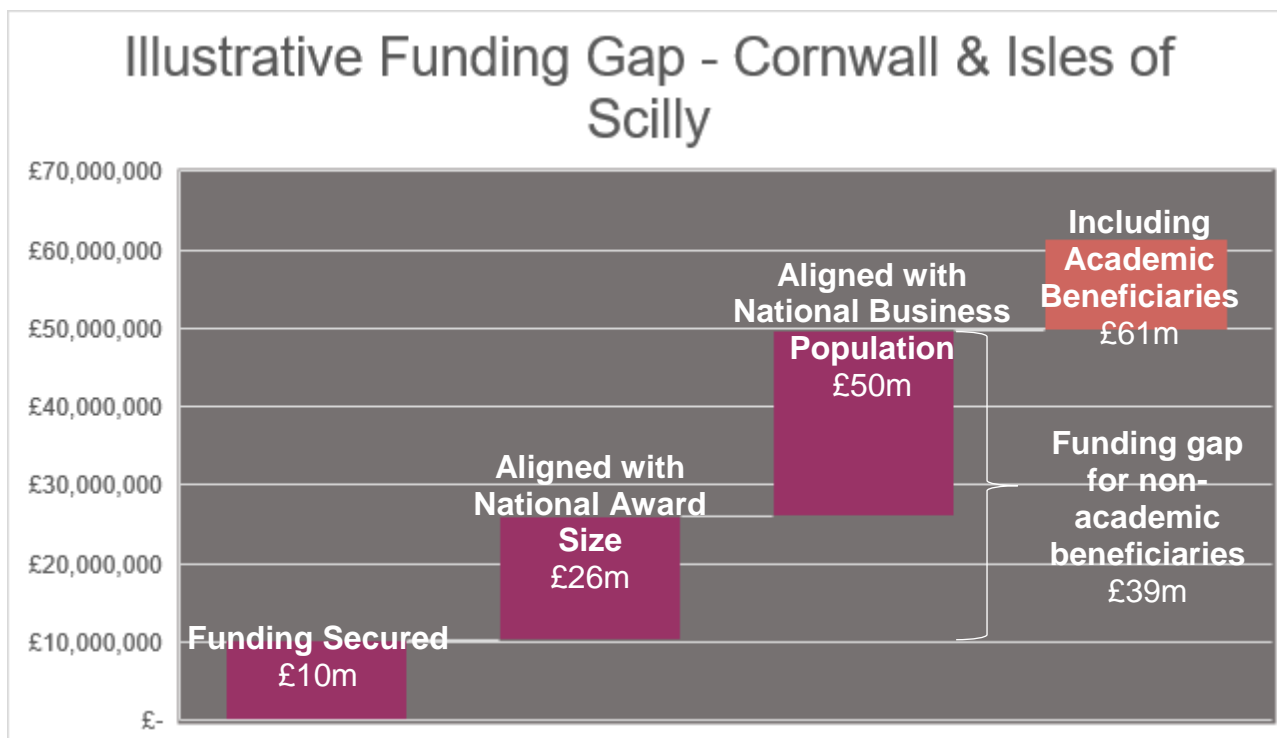
¹ £212k per award when including academic beneficiaries.

Table A1: Illustrative calculation for the Region of South West

1. Funding Secured by region	£ 700m	14% of IUK funding
2. If average award size aligned with UK	(2,162 x 216,000) £ 467m	
3. Business base		9% of national business population
4. Award aligned with business base		
Award Expected: (No of awards x 9% x mean award size)		£447m
Actual Award:		£700m
Shortfall / Excess		£254m
5. Comparing to Expected Outcome if Academic Awards are included		
Shortfall / Excess – incl academic (Actual Award less Expected Award Including Academic Beneficiaries; £555m)		£146m

12. The national total is here designated as all projects funded that are not identified as 'Outside the UK'. Therefore, projects with beneficiaries in London, Wales, North Ireland and London are included.

13. The Figures below present results for each of the LEPs separating the analysis in chapter 2.



Company Data Analysis

14. The Innovate UK data has then been linked using the Companies House data to other data sources focused on innovation activity by firms. It draws on firm-level data:

- FAME database of information on companies and unincorporated business throughout the UK and Ireland including accounts and documents as filed at

Companies House and the Companies Registration Office in Ireland. This provides employment, turnover and profits for the largest UK businesses and also includes R&D expenditure.

- Intellectual Property Office list of registered UK Patents as of January 2018.
- Business incubators and accelerators: UK directory (2017).

15. Finally, the data sources used to provide wider economic context were:

- Extracts from Nomis² – the ONS service to access detailed and up-to-date UK business counts from the Business Register and Employment Survey 2016.

Profile of Innovate UK Supported Businesses

16. The business data compiled can be analysed at firm-level to understand what is different about the businesses that are supported by Innovate UK. A simple, but powerful, analysis was undertaken to characterise the supported businesses at a national level. For this, the outcome variable was whether a business had received Innovate UK support at some point according to the Innovate UK public data. There were 12,529 supported businesses in the dataset that could be linked to the Companies House register and over 3.6m businesses in total on the register excluding dormant companies, holding companies and companies set up to manage properties.

² Nomis is run by the University of Durham on behalf of the ONS. First launched in 1981, Nomis houses an extensive range of government statistical information on the UK labour market including Employment, Unemployment, Earnings and Annual Population Survey.

Table A2: Variables used in Profiling Innovative Businesses

Variables	Description	Source
Innovation variables		
Holding a patent	IPO Patent Register linked to Companies House Register to identify owners using company name matching and other routines	Belmana FAME with
Reporting R&D in accounts	Any R&D expenditure reported in the company accounts in years 2012 to latest accounts	Belmana analysis
Reporting exports in accounts	Any overseas sales reported in the company accounts in years 2012 to latest accounts	Belmana analysis
Industry variables		
Knowledge Intensive Manufacturing	Companies House 3-digit Standard Industrial Classification: high-tech manufacturing (SIC 21, 26, 30.3) and medium/high-tech manufacturing (20-21, 25.4, 26-29, 30 [excl. 30.1], 31.5)	SQW (2013)
Knowledge Intensive Services	Companies House 3-digit Standard Industrial Classification: high tech knowledge intensive services (SIC 59-63, 72) Medium/High-tech knowledge services (58-63, 71-72, 74.9).	based on Eurostat
Agri-tech	Companies House 3-digit Standard Industrial Classification: 202, 283, 712; 4-digit: 164, 2015, 2651, 2222, 8292; 5-digit 74909 (narrow); 3-digit: 99-130 added for broad definition	SQW (2016)
Size variables		
Small	Not reporting accounts due to size of business being below reporting thresholds	Belmana analysis

17. Using the linked datasets, the variables created are described in Table A2. Each relies on the publicly accessible business data. So, while employment or turnover might be useful in analysing the chance of benefitting from Innovate UK support, these are available only for the largest businesses that are required to report accounts completely.

18. Characterising the drivers for successful applications to Innovate UK was through a probit analysis followed by marginal analysis at different combinations of the characteristics. The probit models the chance of a successful application, which is estimated using a constant term and all the variables in Table A2. The results of the probit are in Table A3 and the fit is relatively high, explaining 20% of the variation seen in the chance of successfully receiving support (the pseudo R-squared).

Table A3: Results of probit Analysis of Innovate UK support

Variables	Probit Results	Marginals
Innovation variables		
Holding a patent	1.38*** (0.01)	0.06*** (0.00)
Reporting R&D in accounts	0.23*** (0.05)	0.002*** (0.00)
Reporting exports in accounts	0.40*** (0.02)	0.004*** (0.00)
Industry variables		
High Knowledge Intensive Manufacturing	0.11*** (0.03)	0.001*** (0.00)
High-Medium KI Manufacturing	0.92*** (0.02)	0.02*** (0.00)
High Knowledge Intensive Services	0.31*** (0.01)	0.003*** (0.00)
High-Medium KI Services	0.25*** (0.01)	0.002*** (0.00)
Broad Agritech	0.72*** (0.03)	0.01*** (0.00)
Narrow Agritech	-0.28*** (0.03)	-0.001*** (0.00)
Other variables		
Small business	-0.70*** (0.01)	-0.01*** (0.00)
Constant	-2.33*** (0.01)	n/a
Summary for regression		
Observations	3,607,917	
R-squared	0.20***	

*** significant at 1%; marginal are for a discrete change of dummy variable from 0 to one.

19. Individual variables in the probit are highly significant and generally have the right sign: holding a patent, reporting R&D or exports all increase the chance of being in the beneficiary list. The industry variables are also as expected, though the narrowing of the Agritech definition does not increase the chance of being a successful applicant, unlike narrowing the businesses that are classified as knowledge intensity to those in the highly intensive knowledge sectors. This suggests the broad definition is providing more predictive power.

20. The probit results can then be further analysed by seeing how the chance of being an Innovate UK supported business increases by changes in each variable. This is the marginal analysis in Table A3. It indicates how much the chance of being a successful applicant alters if the average business changes each characteristic. The table indicates that becoming a patent holder is the strongest correlate in this marginal analysis, followed by the reporting of exports and R&D activity. These correlates do not reflect causality and – as Innovate UK is funding R&D which often results in patenting or reporting R&D expenditure – the causality may run the opposite way with being a successful applicant resulting in the characteristics changing rather than characteristics driving the application. However, this analysis serves in profiling businesses in terms of what can be found in accessible data.