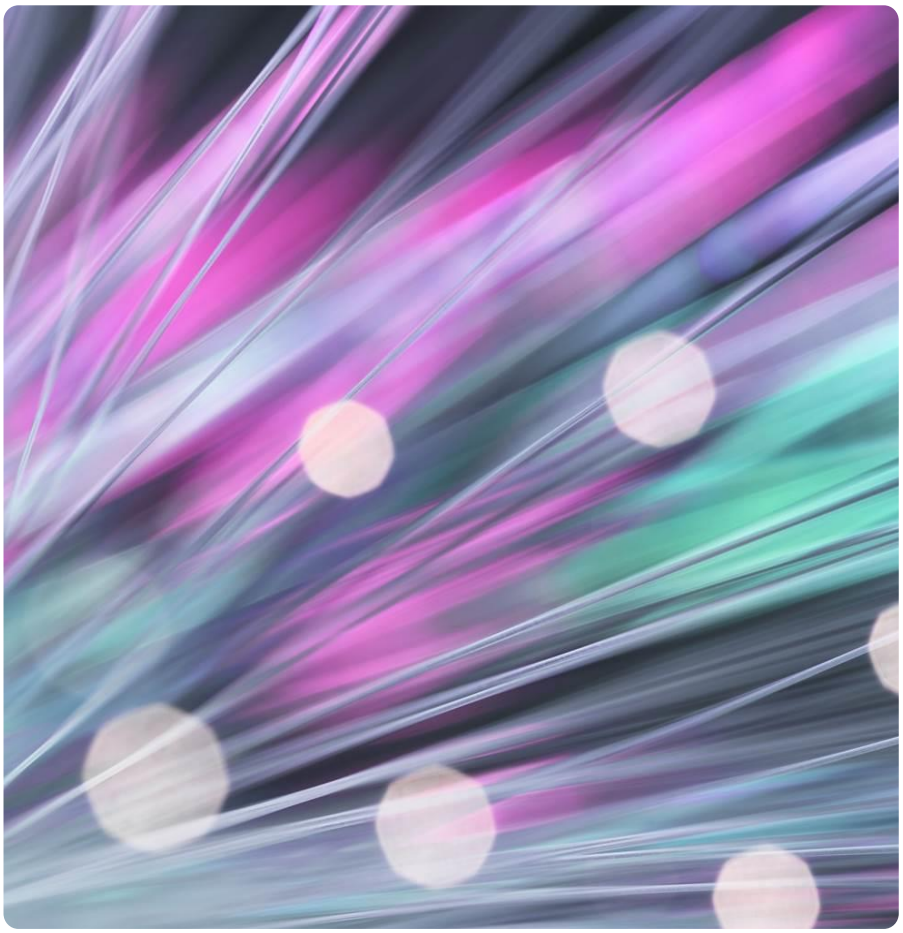

Interim Report

Best practice and learnings to inform national policy development

Connecting Capability Fund Programme Enhancement Team

February 2023

Bringing Ingenuity to Life

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Contents

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Executive summary

Purpose of this report

Research England (RE) established The Connecting Capability Fund (CCF) programme to incentivise Higher Education Providers (HEPs) to share good practice and capacity across the sector, through collaborative partnerships which explore different aspects of commercialisation. In particular, these partnerships supported strategic approaches to commercialisation of university research and collaborative research with industry.

A pilot round funded 18 three-year CCF projects, and 11 of these received either a one or two year extension to continue to evolve their activities. Research England has set up a Programme Enhancement Team (PET) to help to maximise the benefits of this programme, improve learning and development, strengthen the cohort of projects, and support wider dissemination of insights across the Higher Education sector.

This report is the first stage of PET support and aims to summarise best practice and learning to inform national policy development. Future PET activities will include organising further events with CCF project teams and others to showcase the learning from the projects, developing and implementing of a strategy for dissemination of good practice, and establishing a repository of materials generated by the projects.

Commercialisation of university research

When it comes to commercialisation and adoption of university research, there are some common themes in how to identify, assess, develop and encourage adoption of outputs. The availability of translational funding is effective in itself. It encourages academics, students and others to get involved, with different mechanisms proving effective to encourage collaboration both between universities and with industrial partners. Using a problem-driven approach to identify societal and industry needs can increase engagement and the relevance of project opportunities. Having generated a pool of potential opportunities, the next stage is to assess which of these projects should be funded and supported. Higher levels of rigour can be useful if the aim is to generate a pipeline of high-growth spin-outs, whilst more inclusive approaches may be needed if the aim is to explore different knowledge areas. Shared decision-making is useful both to ensure that the project partners can learn from each other and to identify synergies and cross-university opportunities. Including external members in decision-making panels was found to be extremely useful as a way to increase HEP learning and provide real-world feedback for the projects. Supporting researchers to develop their case for funding, investment-committee style pitches, and the adoption of harmonised assessment criteria or a voting process were all used to help to get the opportunities ready and select those to take through the next steps.

Significant amounts of CCF funding were invested into Proof of Concept (PoC) awards, which is very important due to the shortage of alternative sources of small-scale validation funds. An award size of around £50k proved effective in many cases, though larger amounts were needed in some sectors (e.g. therapeutics). The overall aim of PoC funding is typically to reduce late-stage failure by testing projects earlier, de-risking and accelerating commercially viable products to market. In addition, tangible prototyping or demonstrator outputs can help to generate future commercial interest.

The two main routes through which university research can be commercialised are by forming a spin-out or licensing to an existing company. More of the CCF projects focused on spin-out formation than licensing and industry engagement with licensing opportunities appears to require a more focused approach. For HEPs which had not formed many (or any) spin-outs in the past, the chance to learn from other CCF members with more experience by working through the challenges posed by actual potential spin-out projects worked really well. In order to be fully effective, support provided by the CCF projects for the spin out pipeline needs to cover the whole process from idea generation, through proof-of-concept funding, business evaluation, finding experienced executives, and seed funding.

The next stage is to find investment for these companies, and four of the CCF projects had a primary aim of raising a venture fund to invest in their pipeline of potential spin-outs. Different structures for these funds have varying benefits depending on the projects' situations. A traditional, limited life venture capital fund typically runs for 10 years, with distinct investment, management and exit phases. This type of fund is usually managed by an experienced fund manager who can bring in external investors, and set up processes to identify and develop promising companies. Another approach is to use a patient capital fund, with a more open-ended lifetime and which may be able to recycle the returns from successful investments back into the fund. One CCF project that has taken this approach set up an internal

management structure, using experienced leadership to attract external investment. The fund has successfully raised a first close of £215m to support the type of deep tech opportunities emerging from their partner universities, which require a longer timeframe and more capital to reach maturity. A third route is to take advantage of angel investors, reflected by a CCF project which has established an angel fund to match funding from Innovate UK, providing a solid start for companies that have been de-risked by the CCF project.

Collaborating with industry

When promoting and encouraging collaborative research with industry, involving industry stakeholders on decision-making boards and steering committees helps to pull in industry knowledge, whilst having dedicated internal business development teams are an effective way to build, maintain and grow both industry and academic relationships systematically. Trying to maintain up-to-date maps of academic expertise proved less successful, as these can quickly become out of date.

Understanding the underlying structure of the particular industry sector is also important to identify the companies which are at the right stage to benefit from collaboration. Focusing mainly on high-growth and scale-up companies, can accelerate the translation of academic research into commercial products, and allows efficient use of time and effort. Nevertheless, there can also be value in casting the net wide for potential collaborators, particularly where there is a large cohort of companies who could benefit from working with the project partners. In this approach, projects focus on the industry partner problems and match those to academic expertise through a “single front door”. This could be through industry-led discovery sessions or the knowledge of the university business development managers.

The level of project engagement with SMEs varied depending on sector, strategy and geographical opportunities. Working with SMEs is seen to bring rich knowledge and the agility to achieve rapid results, but must be balanced against the higher levels of risk, time and effort involved. To communicate this message, short bursts of purposeful campaigns were used to demonstrate readiness, ease of collaboration and ultimately attract SMEs. Targeted funding calls and innovation voucher schemes are particularly useful when finding and collaborating with SMEs. For companies of all sizes, tailoring the language used to their needs and ambitions is very important to get and maintain engagement.

Similar approaches can be used to bring academic researchers into the collaborations; networking, conferences, secondments and joint ideation events can all be used to bring academics and industry together, and provision of funding opportunities helps to drive engagement. Universities that were teaching intensive, but more outward facing, already engaged with industry and the local area were found to have a wide pool of academics willing to collaborate.

In making decisions on which opportunities to support, similar approaches were taken to those adopted for development of an academic IP pipeline. However, in industry collaborations, more emphasis is sometimes placed on the commercial due diligence of the industry partner. Other criteria may include value to the business, benefit to the region, alignment with the CCF project ambitions, diversity of opportunity types, and likelihood of project success. External input is again very valuable, bringing decision-makers with the right skill and mindset to assess both risk and opportunity.

Marketing activities are important in building a network and brand offering that gives a very clear message to potential industry partners about how they will benefit from engagement with the project, the mechanisms of interaction, and describes focused productised service offerings. Having multiple routes to marketing is usually the most effective.

Sector specific approaches

The activities of at least 11 CCF projects were targeted towards a particular industry sector and were driven by the needs of that sector, leading to a multi-disciplinary approach and engagement with a wide range of researchers. Sector-specific intermediaries with deep knowledge of the industry sector and broad networks are very important to drive these commercialisation activities. Similar basic commercialisation mechanisms are effective across the different sectors, but there are differences of detail, for example in the content of training courses, or in the language and terminology that is used, which must be tailored to both the industry sector needs and the academic specialisms involved. One advantage to a relatively narrow industry or technology focus is that it is typically easier to identify and engage with industry stakeholders and identify relevant researcher expertise, and as such making connections and building an engaged community is simpler.

People and ecosystems

Formalised training was a key part of the programme, with many thousands of hours delivered. Training and course content was most effective when driven by real purpose, being specific and meaningful to the stakeholder group. Skills training in commercialisation, entrepreneurship and business engagement was fundamental to creating confidence to encourage collaboration and entrepreneurial activities. As well as more formal courses, mentorship and “learning by doing” are very important aspects of talent development. These experiential modes allow the training to move from theory to practical knowledge and skills. Forming cohorts with a shared learning journey also helps to develop networks and support mechanisms to reinforce the formal learning.

Using a mixture of course delivery methods has become increasingly necessary through the advent of COVID-19 restrictions. This prompted a fundamental shift in thinking towards more efficient, effective and innovative ways to deliver courses. Rather than focusing on half or full-day delivery, projects created immersive learning experiences and a blended approach has become best practice to ensure flexibility. Online training remains popular post-pandemic, particularly for time-poor SMEs or to fit around academic schedules.

Developing local geographic regions became a natural and organic focus across some projects, which worked with local authorities and regional corporate leads on boards and panels, as well as linking up with other similar networks and clusters. Projects that relied on specific subject matter expertise on niche topics focused on nationwide cluster development as opposed to specific regions, building up the ecosystem around the technology focus, rather than the geographic area. As with industry engagement, clusters and ecosystems rely heavily on marketing and engagement activities to build and strengthen the interactions.

Managing ideas and knowledge

The CCF programme also generated valuable learnings about how to run and manage collaborative projects of this scale and scope. The overall governance structures for these projects should be set up as early as possible, and if possible, should involve senior university management to provide direction and support. External opinion leaders are also very useful, for example in strategic advisory boards. There are benefits to building the project management structures including a full-time project manager as early as possible, ideally a few months before the official project launch and start of activities. Several of the CCF projects developed project management manuals, project planning tools and other support materials which were shared amongst their members.

Standardised IP policies were not appropriate, due to the differences in individual research base, vision, impact ambitions, local partners, and resources available in each institution. Instead, a much better approach is to use the close-knit cross-institutional teams within the CCF projects as a sounding board, allowing HEPs to adapt their existing approaches through alignment and sharing of best practices. Similarly, standard templates and agreements can be useful in some circumstances, but may be resisted by potential industry partners or investors who have their own established precedents. A common framework or approach to negotiation can prove more tractable.

Conclusion and future directions

The learnings emerging from the CCF programme highlight the value of commercialisation activity for HEPs, industry partners, and to spin-outs. Some repeatable process learnings have been identified that could form the basis for accelerating and enhancing similar future collaborative projects. Listening to other’s experiences and applying this knowledge elsewhere was found to be extremely valuable. Projects which combined expertise in a specific industry sector or subject area from multiple universities found that there were benefits both from achieving critical mass, and from the sharing of specialised staff with industry insights and networks. The programme also allowed different projects to experiment with commercialisation mechanisms, for example testing different mechanisms to set up and run a university venture fund. Some areas of commercialisation that were less well covered by the programme include how to engage with large industry partners and licensing. The overall CCF programme covers a wide spectrum of different industries, including a number that were previously prioritised by the government’s Industrial Strategy, but often focused onto a very specific area largely in the health and life sciences sectors. This means that there are still several industry sectors and specialisms that could be identified where a combined approach that brings together the expertise across more than one institution remains to be explored.

Use of proof of concept funding to develop commercialisation opportunities is a near-universal requirement, and something that the projects have found challenging to replace from other sources. Entrepreneurial training and upskilling are also common requirements, and the successful approaches taken by the different projects can be shared easily with the sector. The communities of practice that began to emerge during the programme are a good way to share knowledge and experiences, and would be useful to continue, perhaps in association with other organisations with similar aims and stakeholders. A continued challenge across many universities is a lack of experienced commercialisation support staff, which suggests that improved training, mentoring and career paths are still required to attract and retain more candidates.

Overall, this review has uncovered plentiful evidence of valuable outcomes from the CCF programme, and of the sharing of learnings and dissemination of good practice. The future activities to be carried out by the PET are expected to continue this process of exploration, and spread these learnings further afield.

1 Introduction

The Connecting Capability Fund (CCF) programme managed by Research England (RE) was established to incentivise Higher Education Providers (HEPs) to share good practice and capacity across the sector, forging external technological, industrial and regional partnerships, and delivering the government's priorities.

The objectives of the CCF are:

To strengthen the contribution of English HEPs to productivity and economic growth and to deliver the objectives of the Government's priorities, by:

- enhancing effectiveness in use of the university knowledge base to deliver commercial and business applications and wider applications for the economy and society, through:
- stimulating strategic collaboration between HEPs across England which:
  - delivers pooling of knowledge exchange (KE) expertise and capabilities so that businesses and other users can access a range of commercialisation offers or a critical mass of knowledge
  - builds capacity to provide cross-university responses to technological or industrial sectoral or inter-disciplinary challenges, or to regional alignments and challenges
  - incentivises sharing of expertise in commercialisation and dissemination of good practice across the HE sector.

A pilot round of 18 CCF projects was funded from 2017-18 to 2020-21, and 11 of these successfully applied for one or two year extensions to continue to evolve their activities (see section 4). Four of these projects are still in progress and will complete in July 2023.

The collaborations supported by the CCF involve multiple HEPs (with a requirement to have at least three English HEPs in each project), as well as businesses, investors and other partners. The main focus for the programme was commercialisation of university research, and collaborative research conducted with industry, and we use the term "commercialisation" throughout the report to cover all the activities that were within scope. Direct support for businesses was not eligible, and student enterprise could only form a minor component of the activity of a CCF project. Common objectives and activities within the many CCF projects include:

- development of spinout companies and start-ups
- creation of university venture funds
- enhanced licensing of university intellectual property (IP)
- strengthened partnerships with business – both large corporates and SMEs
- simplified access to university research and expertise for specific sectors
- development of technology clusters

- reinforcement of regional strengths
- building networks
- student enterprise (as a minor activity)

Research England has set up a Programme Enhancement Team to help to maximise the benefits of the programme, improve learning and development, strengthen the cohort of projects, and support wider dissemination of insights across the Higher Education sector.

2 Purpose

PA Consulting and IP Pragmatics have been appointed by Research England as the Programme Enhancement Team for the CCF programme. The aims of the CCF Programme Enhancement Team (PET) are to:

- Achieve greater efficiency and effectiveness of CCF projects to improve outcomes creating a higher Value for Money and return on investment for the programme
- Improve learning and development between CCF HEP partners, and external partners
- Identify and allow for wider dissemination of good practices and insights from the programme

This interim report is part of the first stage of PET support. The purpose of this interim report is to summarise best practice and learning to inform national policy development. The report will aim to consolidate, review and draw out key insights on:

- Ways to improve commercialisation activity between universities and businesses
- How to form and manage strong, successful cross sector & university projects
- Gaps and what has not worked so well to inform learnings from failures as well as successes

We foresee benefits from these insights for several different audiences, including helping:

- CCF Projects to learn from each other
- The Higher Education sector to be aware of and adopt new ideas and approaches to commercialisation
- Research England to gain insight into what works well in commercialisation, and where there may be gaps and opportunities
- Policymakers to get a clearer picture of how to develop and support the UK innovation ecosystem

It is important to note that this report is not intended to be an evaluation of the CCF programme as a whole, nor of any individual CCF project, as these will continue to be monitored by Research England as before.

Future PET activities will include organising further events with CCF project teams and others to showcase the learning from the projects, developing and implementing of a strategy for dissemination of good practice, and establishing a repository of the materials generated by the projects.

3 Methodology

So far, the review has undertaken:

- Analysis of background information on each of the 18 projects, including:
    - Key performance indicators (KPIs) agreed for each project, monitoring and evaluation reports
    - Public sources, including websites, press releases and other case studies
- Online interviews via MS Teams with each of the 18 project leads or equivalent to understand their approaches to developing commercialisation best practice, types of learning and dissemination the programme generated. Each interview was transcribed using the MS Teams transcription function
- An online survey form completed by each of the project leads via MS Forms (we received responses from 14 out of 18 CCF projects) to supplement factual data with qualitative viewpoints
- An online event covering key issues, such as skills and knowledge and continuing activity, attended by 21 representatives from across 15 of the CCF project teams
- Information gathering of materials generated by each CCF project via email including specific commercialisation support documentation learning and training material

The information gathered from these sources and the full interview transcriptions were assessed using a thematic approach to identify insights across the 18 CCF projects.

We carried out semi-structured interviews with the individual CCF Projects following an interview guide to gather structured qualitative responses (see Appendix 3 for the interview guide used). Following the interview, the CCF projects were asked to complete a short survey to further supplement insights with quantitative data (see Appendix 4 for questions and full responses). The interview and survey form have been used to explore some or all of the following topics:

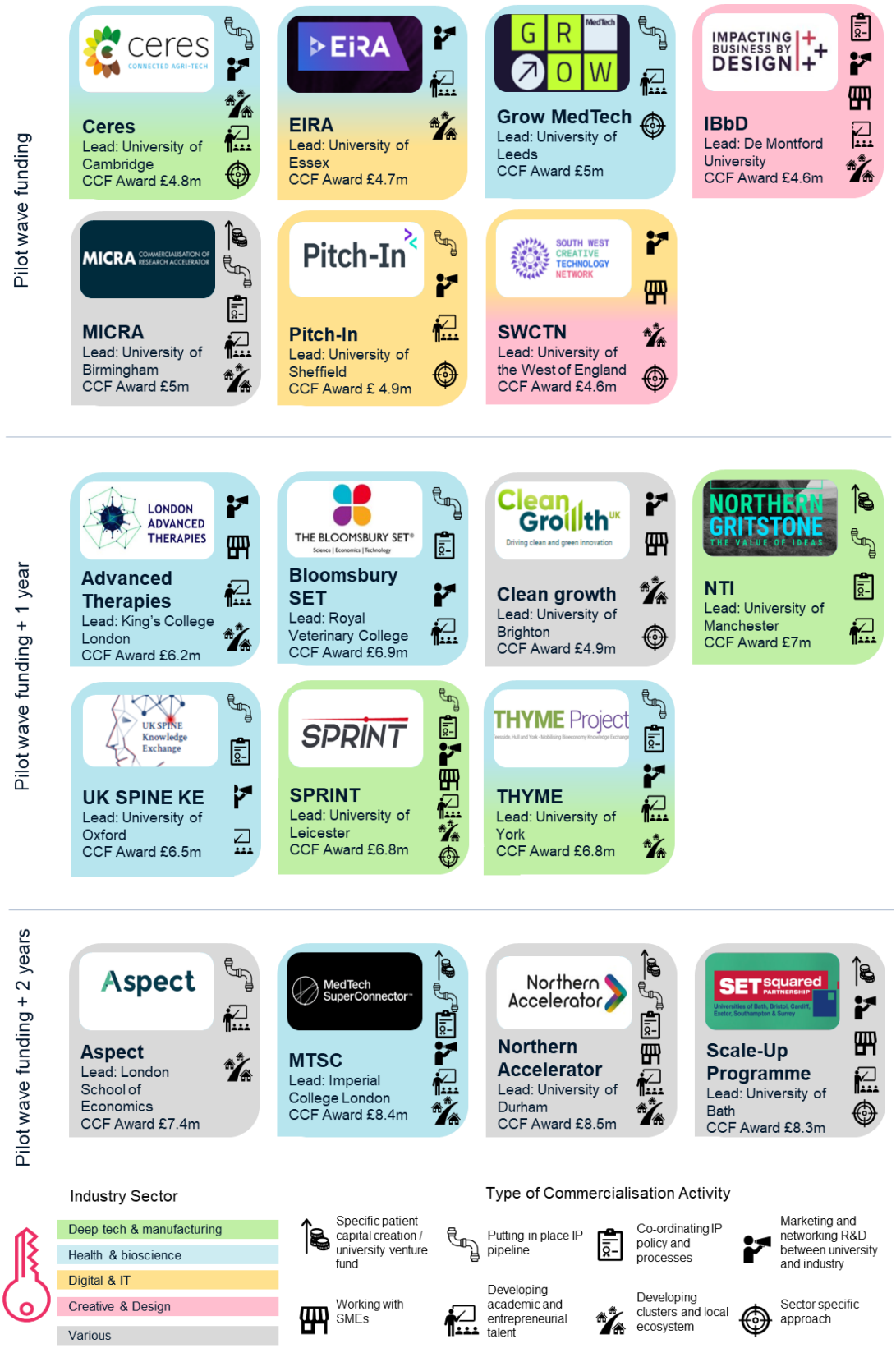
- Support and learning materials generated by the CCF project
- Best practice learnings on what works (and what does not) in specific aspects of research commercialisation and working with business
- Effectiveness in disseminating and embedding of best practices, policies and approaches
- Successes in embedding of shared capabilities, and sustainability of projects and approaches
- The contribution the CCF programme has made/will likely make to policy and practice in commercialisation
- Extent to which the CCF programme has contributed to the innovation agenda, the place agenda, and other Government priorities
- Creation of specific patient capital/university venture fund

It is important to note that the evidence collection has been anecdotal, not systematic, or exhaustive. The figures reported in this study relate to the state of play in the projects as was reported at the time of the interviews (September – November 2022).

Appendix 2 lists the individuals who were interviewed during this project. We will continue to compile feedback, and would welcome any additional input from individuals who were previously involved in a CCF project and who would like to contribute.

4 Overview and coverage of CCF projects

CCF projects cover a range of commercialisation activities, the most common type of activity addressed were; developing academic and entrepreneurial talent to support commercialisation, developing cluster and local ecosystems, and marketing and networking R&D between university and industry/business. Some CCF projects also focused on other activities such as network creation, good practice development, accelerator creation and outreach. The projects also covered a range of different industry sectors.



5 Overview of learning generated

The messages from the interviews and materials gathered have been grouped together into the following thematic sections. Each section includes examples of approaches that different CCF projects have found to be useful (or found not to be useful) in terms of delivering their commercialisation ambitions. Each theme is illustrated with a small number of case studies.

Every CCF project faced different challenges and needed to find tailored solutions that worked for them, suggesting that a standardised approach will not work. The insights obtained through these different solutions can provide learning for others, but will need to be adapted and customised to the specific project or HEP environment. The CCF projects reported the value of listening to others' experiences and adapting those to their specific situation.

14 out of 18 CCF projects responded identifying the most common types of materials generated throughout the course of projects to be:

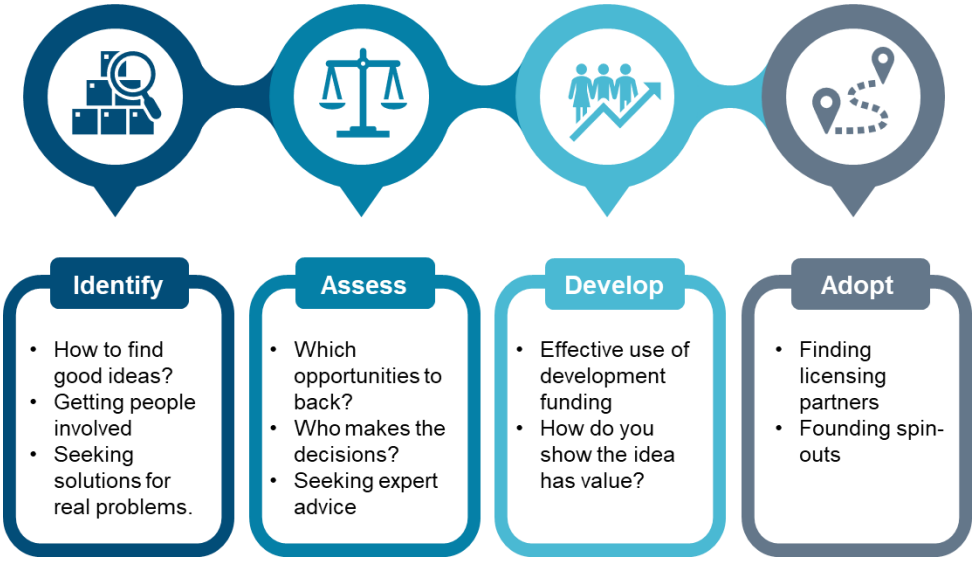
- **86%** generated training materials
- **64%** generated brochures and guidance
- **57%** generated SOPs

Nevertheless, we found significant commonality of challenges and over-arching approaches to solve those challenges, even across different types of CCF project. The differences manifested themselves in the details of the people and partners and sector-driven specifics that were needed to solve these individual problems. Whether the projects were trying to progress an internal pipeline driven by fundamental research or trying to find successful ways to collaborate with industry, there were common challenges in how to find, select, and support the most promising opportunities that are explored further in the following sections.

The following sections 6-10 cover the learning generated by the CCF projects in more depth.

6 Commercialisation and adoption of university research

In order to commercialise the research coming out of universities, the CCF projects faced some common challenges, many of which are the same as those routinely encountered by individual institutions with research outputs that they wish to exploit. This process is a partnership between the technology transfer officers (TTOs) tasked with commercialising the research outputs, and those generating these ideas – academic researchers at all stages of their career, technicians and support staff, or students. Twelve of the CCF projects (67%) included elements of this pipeline development process in their activities.



6.1 Developing an IP pipeline

6.1.1 Identifying opportunities

The first stage to developing an IP pipeline is to identify potential opportunities which may have commercial merit for further support. This requires the input of both researchers and TTOs, as well as engagement with external partners and experts. Providing funding through the CCF projects for dedicated people on the ground in the institutions who were tasked with finding and supporting opportunities was very important. This was particularly the case for HEPs that had previously had little or no local TTO support; in these cases, having additional capacity (provided by the CCF project) was vital, alongside the advice and mentoring of their partners, in allowing them to take the first steps towards commercialisation of their research.

Advertising the availability of funding and support was in many cases found to be an effective way to gain the attention of academics, students and other university members with interesting opportunities and ideas. Having regular funding calls helped to maintain this engagement over the course of projects, generating a steady stream of potential opportunities. Where projects involved building collaborations which brought together researchers from more than one university, a more structured approach was found to be useful to make these introductions. This might take the form of networking meetings and events which brought them together as a community, or sandpit events where different researchers could brainstorm potential solutions to commercial problems and generate collaborative projects to address these. In some cases, the funding structure was also successfully used to engineer collaboration, by requiring at least two academic institutions per project, or by the need to include an industry partner in later-stage projects. Nevertheless, existing relationships often formed the foundation for these collaborations.

Using a problem-driven approach was found to increase both the level of engagement of the academics in the funding rounds, and the relevance of the project opportunities (see case study 1). This was a common theme across the programme, and different mechanisms were tried to identify industry or user needs. Joint academic-industry meetings generated industry-led questions, and accelerators and workshops were used to generate new research proposals to meet specific societal problems. Another successful approach was to tap into the business development experts within the project to get industry input into which projects would be valuable.

Case study 1: Challenge driven collaboration with Industry, NGOs and policy makers.

Bloomsbury SET found that the level of academic engagement was fairly low when they used broad funding calls. A better approach was to use industry, NGOs and policymakers to set the challenges and problems to frame a more structured funding request. This type of narrow, relatively small-scale funding opportunity was also well suited to early career researchers.

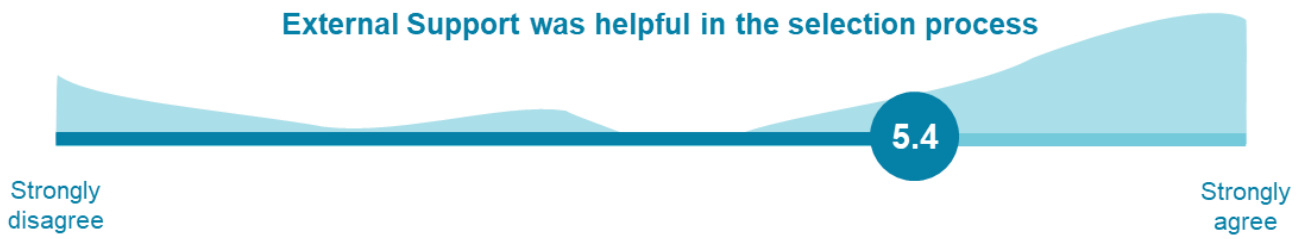
6.1.2 Assessing which opportunities to support

Having generated a pool of interesting ideas, the next stage in the commercialisation process is to decide which of these projects should be progressed and funded. Different approaches were tried, but all the CCF projects were looking for the most commercially promising opportunities (and not simply spreading the funding between the partners).

The type of mechanisms used across the programme were influenced by the outcomes that they were seeking, with high levels of rigour applied by the projects that were trying to build a pipeline of investable high-growth spin-outs (to underpin the raising of a university venture fund), and a more inclusive approach from CCF projects that wanted to experiment with a range of potential project outcomes (such as developing novel technology or knowledge areas). Where the aim is to develop compelling spin-out propositions, a highly selective process with specific hurdles might lead to better decision making. This is akin to the approach that would be taken by the investment committee of a venture capital fund. For example, this might involve assessing the opportunity in terms of the business proposition, strength of the IP, quality of the team, detailed budget plans and likely commercial returns. This rigour raises the quality of the opportunities presented to the decision panel, with all partners striving to develop their projects to the point where they are “investable”.

All the decision-making panels included representatives from all the HEP partners, partly for equitable governance, but more importantly to ensure that all the partners could learn from the others, and to identify synergies and cross-university partnership opportunities. For projects with more partners, smaller but balanced groups might have been more efficient, but would reduce these benefits. Including external industry members in decision-making panels was found to be extremely valuable because it increased HEP learning, as well as helping the projects that were seeking funding by providing real-world commercial feedback. This sentiment was shared by the participants in the CCF event, as illustrated in Figure 1.

Figure 1: Summary of reactions from participants in the CCF event to the statement “External support was helpful in the selection process” on a 7-point scale from Strongly disagree to Strongly agree.



Supporting the researchers to make a compelling case for funding is another important part of developing a strong IP pipeline, and at least five of the CCF projects provided guidance to their researchers on how to pitch successfully. Some suggested standardised contents for their pitch decks (see case study 2), or outline mini business plans. They deliberately used commercial language in their assessments and feedback, to move the mindset away from grant funding towards commercial decision-

making. The format for the application panel can also be used to prepare the projects for future fundraising; for example, by using a “Dragon’s Den” format for the projects to pitch for funding. Providing constructive feedback was also vital to help the projects understand what the next steps should be to improve their commercial proposition.

Case study 2: Pitching compelling proof of concepts

Ceres developed a PowerPoint guide[1] for researchers on how to pitch for their proof-of-concept awards with tips on when and how to use a pitch deck to tell a compelling story. This elaborated on the key points that should be covered by the pitch:

- The problem
- The opportunity
- The solution, work to date, rationale
- Proposed activity with timescales and costs
- Future plans

Two broad approaches to project selection were tried by the CCF projects:

- Several of the CCF projects developed **harmonised assessment criteria and guidance** on which projects should be selected for support. This proved so successful for one CCF project that the same criteria are being used to assess internal opportunities, as well as being introduced to the new Universities that have recently joined the project.
- In contrast, another CCF project believed that a standard scoring system would lead to homogeneity in the scores as the high and low range scores are rarely used. Instead, their approach involved **open discussion** of each project, led by an external Chair, f**ollowed by a voting process** to determine whether each project was funded or not.

6.1.3 Developing the projects

Significant amounts of CCF funding were invested into different types of Proof of Concept (PoC) and/or follow-on funding awards to help to develop individual projects and opportunities in the IP pipelines supported by the projects. This was often mentioned as being extremely important, due to the shortage of alternative sources of funding for this type of small-scale validation work, and the need to increase the commercial readiness of the opportunities. The amounts awarded to each project varied; many were in the range of £30k-£100k, with typical awards being around £50k. These relatively small amounts of funding proved to be very effective, and were sufficient to make a tangible difference to the development of the technology and to interest the researchers in participating. There were some sectors, however, where larger funding awards were needed in order to make significant progress. For example, a larger scale and size of projects were important to the those CCF projects working in areas such as drug discovery and development opportunities where larger amounts of money are typically needed.

Once they were awarded, efficient monitoring approaches were required to ensure that the opportunities that were funded were on track and spending the funds awarded. An industry-like approach to structuring and monitoring these projects helped with this process.

The PoC funding can be put to a wide range of uses, with a number of projects making sure that these had tangible prototyping or demonstrator outputs to help to generate future commercial interest. For example, one CCF project used videos as “calling cards” to promote the prototypes and outputs of their projects. The aim of PoC funding is typically to reduce late-stage failure by testing projects earlier, de-risking and accelerating commercially viable products to market.

[1] https://www.ceresagritech.org/wp-content/uploads/2021/01/Pitching-for-Proof-of-Concept-Awards.pdf

6.1.4 Adoption through spin-out or licensing

Although other options are also available, the two main routes through which university research can be commercialised are by forming a spin-out company to develop the idea further and take it to market, or by identifying an existing company with an interest in the area, and licensing the opportunity to them to commercialise. The two options have different advantages and disadvantages depending on the circumstances, but as a general rule of thumb, spin-outs are more suited to ground-breaking technologies opening up new markets, whilst licensing is more efficient where a technology provides an incremental improvement in an established market.

Some CCF projects had more of a focus on spin-out formation, and supplemented the PoC funding to improve the technology opportunities with other types of support to help to develop the nascent companies. In many cases, this took the form of training, mentoring and skills development (discussed in more depth in section 9.1. People and ecosystem development is at the heart of successful innovation and commercialisation. Being led by the strengths of local places, leveraging networks and upskilling various stakeholders was enabled by CCF (whether intentional or not) and occurred across projects. In most cases, varying forms of effective training efforts took place to develop entrepreneurial talent, especially for academics. Other types of support programmes were also used to develop potential spin-out companies (see case study 3).

Case study 3: End-to-end support for spin-out formation

The Northern Accelerator developed a spin-out pipeline which was adopted by all the universities and is now being extended to new partners. This takes a whole ecosystem approach which provides funding to accelerate and de-risk the route from research to established spin-out at each stage in the process. From idea generation, through proof-of-concept funding, business evaluation, experienced executives, and seed funding, the CCF project provides support at every step.

Another mechanism that proved successful was to take a cohort-based approach to enrol several proto-businesses into an accelerator programme. As well as being an efficient training mechanism, this had benefits in terms of building support networks amongst the participants. For HEPs which had not formed many (or any) spin-outs in the past, the chance to learn from other CCF members with more experience by working through the challenges posed by actual potential spin-out projects together worked really well. This proved to be much more effective than trying to develop a policy or support mechanisms in the absence of a tangible opportunity.

Whilst spin-out formation formed part of the ambitions of several CCF projects, a smaller number were focused on finding licensing partners for their opportunities. The reasons for this are not clear, but the experiences of one CCF project that developed a technology gateway may shed some light on this. Their aim was to provide a common front door to licensing opportunities from all their universities in an effort to create sufficient scale to interest industry. They also tried to bring researchers with opportunities together into sandpits and events to target specific industries, but found that industry engagement generally needed a more focused approach to be successful. This may suggest that collaborative approaches to licensing would be most useful in a sector-focused CCF project, where there is sufficient commonality of opportunity types to attract the interest of potential industry partners.

6.2 Creating university venture funds

Four of the CCF projects included a primary aim of raising a venture fund which could invest in the spin-out or start-up opportunities that were being developed by their CCF project. These projects formed an informal community of practice, which shared some experiences and approaches.

Two of the projects have made good progress with their fundraising, and each took a different route towards the establishment of the fund, driven by their specific circumstances and ambitions:

- A traditional, limited life **Venture Capital** (VC) fund with a Limited Partner/General Partner structure has been set up by one CCF project. In this type of model, the fund usually runs for 10 years, divided into an investment phase (typically in years 0-3), a management phase where follow-on investments may occur (typically years 3-6), and an exit phase (years 6-10). If money is made by selling the companies that the fund invests into, or by floating these companies (making the company shares available for sale and purchase on a registered stock exchange), then this will be distributed back to the investors in the fund during the exit phase. A seed fund is already in place, with £1.7m contributed by the partner Universities, and run by an experienced fund management company. This structure is already proving useful in developing and testing their process and working relationships. The fund manager is now building on this initial fund to raise a larger investment fund to develop companies in seven inter-connected markets, healthy ageing, the care economy, lifelong learning, climate tech, future work, future homes, and future cities.
- A **Patient Capital** approach was selected by another CCF project and is being explored by two other projects. This fund model is characterised by having a more open-ended lifetime, and they may have the ability to recycle the money received from successful sale or flotation of the investments back into the fund, rather than returning this cash to the fund's investors. Different models were evaluated during the project but the CCF project rejected the traditional route of appointing an external fund manager to raise the investment and run the fund. Instead, they have set up an internal fund, and have recruited highly experienced management, which has helped them to raise their initial funding (see case study 4).

Case study 4: Importance of experienced leadership

Northern Gritstone have successfully raised a first close of £215m to invest in companies in some of the UK's fastest growing sectors such as advanced materials, energy, health technology and cognitive computation. The fund uses a non-traditional structure, with a longer timescale allowing them to take a patient capital approach with extended support for their investments.

The team credit part of their success to attracting Lord Jim O'Neill as Non-Executive Chairman and Duncan Johnson as Chief Executive Officer. Having such experienced leadership was instrumental in convincing investors to contribute to the fund.

By establishing the fund as an in-house, unregulated investment vehicle, they believe their structure will allow their fund-managers to work to different timescales; the initial fund has a 15-year framework. Because it does not have the same time pressures as a fixed-life VC fund, this type of fund can have a longer investment phase, invest in companies which will take longer to mature, and reserve more capital for follow-on investments. This model fits with the type of deep tech opportunities which are emerging from the three research intensive universities involved. These spin-outs typically require longer timescales and significant funding to reach maturity, and the structure of the fund has been deliberately constructed to allow it to invest at seed stage, but then continue to contribute at later A/B/C investment rounds.

Other CCF projects are at an earlier stage in the development of their venture funds. One challenge has been to find advice and expertise from individuals with experience of the challenges of setting up a university-linked fund outside the "Golden Triangle" of London-Oxford-Cambridge; one solution was to use an experienced Venture Capital consultant to provide a consultancy report into the different options available.

To attract investment when the universities involved do not have a long-standing track record of successful spin-out companies, these CCF projects have set out to build a pipeline of opportunities that could attract investors to support this pipeline. Their ambition is to tempt sophisticated investors away

from the Golden Triangle and bring money to other regions – an explicit 'mission' of the Levelling Up agenda. This was built on the premise that these regions have highly productive, highly innovative universities generating plenty of ideas, but may not have the internal cash to progress them, and have few local investors with experience of building high-tech companies. Spin-outs from established investment centres such as Oxford or Cambridge that attract venture capital often have certain characteristics, such as a high growth trajectory, and the expectation of high value returns for those that are successful. Not all the companies arising out of the CCF project pipelines have such high-growth characteristics, so a different type of investor may be needed that recognises that value can still be generated through this type of spin-out. It takes patience and time to identify suitable fund investors with knowledge and experience of university spin-outs who are willing to take a risk on a previously untapped region, but the fundraising success outlined in case study 4 demonstrates that this is possible. One approach that has been successfully employed is for the partner universities to put some initial money into the fund, which both demonstrates their commitment to support the venture, and provides some cash to act as a cornerstone or seed investment to attract others to join them.

Another potential route is to take advantage of angel investors – individuals who have made some money from their successful businesses, and who would like to re-invest this into other growing companies. Another CCF project has established an angel fund which can match funding from Innovate UK. This is a win-win approach, as matched funding is required to secure the Innovate UK funding, and the angel investors can benefit from opportunities that have been de-risked both by going through the Scale-Up programme and endorsed by the due diligence during the funding process.

For this CCF project, the establishment of a separate investment fund is also part of their approach to further development of their services. They believe that as they are already good at brokering other people's funding and investments, they would like to extend this capability to their own investment fund. They have incorporated a limited company as the investment vehicle, appointed a fund manager, and are seeking a cornerstone investor. The proposition in this case is a little different from the other CCF projects, because the majority of the companies that are supported by the project are independent high growth companies, and so the CCF partner universities are less likely to support a fund which will not be investing in its own spin-outs. It is also harder to demonstrate where the deal flow will come from, as the CCF project is built around supporting industry-academia partnerships to respond to specific innovation funding opportunities.

Other CCF projects did not have establishment of a venture fund as one of their main aims, but have included elements of investment support, as part of their support for their IP pipeline, for example building their own angel network, or making links with other investors and angel networks.

7 Collaborating with industry

Industry collaboration is a core element to the commercialisation of technologies, and this was well recognised across the programme. A majority (71%[2]) facilitated commercialisation practices in research collaboration with industry throughout the course of their projects. Successful research collaboration requires well-connected business development managers (BDMs) within the university to identify and broker connections between industry partners and suitable academic researchers.

7.1 Encouraging collaborative R&D projects

7.1.1 Finding and engaging with industry partners

Effective approaches to increasing collaboration include having dedicated roles for stakeholder management, creating a clear strategy with purpose for seeking collaboration and using the right language to attract industry. Dedicated roles and teams focused on identifying and engaging industry stakeholders are effective to build, maintain and grow relationships in a systematic way which improve interaction and make it easier for industry to team-up (see case study 5). In addition, directly embedding industry partners onto decision making boards and steering committees helps to continuously iterate the direction for industry engagement. This had two-fold benefits, dedicated teams push out and diffuse knowledge and having industry embedded in panels, boards and committees pull in knowledge, increasing opportunities for collaboration.

A key theme in searching for industry partners was to leverage existing contacts and form strong networks in specific industry sectors (sometimes using marketing routes see section 9.2) which not only increased HEP-industry interactions, but also promoted relationships and collaborations within industry. Searching for industry partners required some understanding of stakeholder landscape, forums and networks. However, mapping of academic expertise and industry stakeholders took time and ended up being out of date before it was finished. In such cases subject matter experts and external mining websites were used to produce stakeholder mapping spreadsheets.

Case study 5: Enhancing outcomes from engagement with dedicated roles

At SPRINT each university had a tight knit operational structure which included a dedicated innovation advisor acting as the interface with industry companies. Innovation advisors were at the core of delivering engagement with industry. Their role was to have dynamic conversations, extract opportunities in an accelerated way and loop back to academic leads. By doing so, innovation advisors created interactions that mattered and corralled time for finding collaboration opportunities. More recently, SPRINT expanded to a network of 13 universities retaining the innovation advisor structure as a cross partner (rather than each university having a single advisor).

Defining a clear overarching strategy for engagement created purpose for seeking industry collaboration and drove efficiency into finding the right industry partners. Industry engagement strategies looked different across the programme and were dependent on several factors including the structure of the sector (see section 8) and type of innovation. One strategy was to look for companies who were at the “right stage” for collaboration, for example companies who had already demonstrated a high growth potential, beyond the spin-out or start-up phase that had real potential to “scale-up”. By targeting a

[2] 10 out of 14 CCF projects who responded to the survey stated that their project included marketing and networking R&D opportunities between universities and industry as a KE activity.

subset of start-ups that were destined to grow very quickly (where R&D would be of interest) meant impact could be achieved faster by accelerating the translation of academic research. Additional value through collaboration was driven quickly by working with high growth companies. This strategy filtered out industry partners by focusing efforts on attracting a smaller number of high-growth 'scale-up' tech companies that often contracted with higher education talent and would be likely to seek various grant schemes for collaborative R&D. Focusing on a smaller number of industry partners was effective in minimising spread of time/effort and maximising benefit from collaboration. However, the strategy for industry collaboration had to remain flexible and adaptable to the context and structure of the sector.

In direct contrast, other strategies were focused on attracting high numbers of industry collaborations. The purpose of this strategy was to gain momentum and impact through volume of collaboration. This was particularly relevant for the space sector (see later case study 8), where they had a large number of smaller actors and the sustainability sector where high volumes of industry collaboration meant greater spread of message and impact (see later case study 9). The approach to finding and engaging with industry was kept broad to encourage collaboration, rather than filtering out less valuable opportunities. Across the programme setting a clear approach to industry collaboration was key to creating purposeful interactions and finding the right industry partners.

Case study 6: Triple Helix Model to engage collaborative R&D

Clean Growth adopted a triple Helix model to engage collaborative R&D projects. Their regional triple Helix Boards brought together universities, public sector and private sector which allowed large organisations from the public and private sectors to collaborate and share knowledge around major low carbon and sustainability initiatives in the region.

Encouraging collaborative R&D projects and engaging with industry partners required projects to 'package the offer', be responsive, offer efficiency and use the right language to attract industry. This was noted as "the real challenge in engaging with industry". Creating incentives (including PoC funding opportunities) to attract industry was a part of encouraging collaboration and increasing engagement. An effective example was positioning the CCF project offer as a "single front door" to help industry navigate and access the assets of several universities with triaged support. The incentive for industry was they would have a route into a number of different resources. The awareness of industry's increasing use of HEPs for ideas and solutions to industry challenges meant that using a problem-driven approach was a great incentive to encourage collaboration (see case studies 6 and 7). Engagement models were built around identifying solutions to industry challenges. Focusing on industry partner problems and making the connection to academic expertise (with less emphasis on type of industry partner) was a widely used engagement approach. Designing industry-led discovery sessions was effective in identifying industry innovation challenges, gaps and informed the identification of the right university services to support industry partners.

Case study 7: Demonstrating value add to encourage industry engagement

Pitch-In used “demonstrators” to showcase value add from collaborative working between HEPs and industry. One example of a successful demonstrator was their work using new IoT technologies to rapidly share vital information about the potential for landslides with the authorities managing the road network. The Pitch-In project enabled collaboration between Newcastle University and a range of project partners who manage major road networks in Scotland and the UK, including Transport Scotland; consultancies working on their behalf including Jacobs; and Cumbria County Council. The project addressed primary barriers to IoT innovation including the lack of understanding in businesses about how to incorporate IoT-based applications into their existing processes. By demonstrating value-add from academic research the Pitch-In demonstrator facilitated knowledge exchange between Newcastle University (who were able to use real projects and data to inform its research papers), whilst industry partners gained the benefit and insights of the landslide monitoring system. This Pitch-In project achieved a permanent move by Transport Scotland to fund and integrate the monitoring system at a key risk hotspot to manage potential landslides on the road.

7.1.2 Working with SMEs

The level of engagement with SMEs was dependent on sector (see case studies 8 and 9), overarching strategy/purpose of projects and geographical opportunity to work with larger companies. Effectiveness of working with SMEs also depended on the stage they were at, for example high growth SMEs in the mid-stage of their life cycle were found to be doing more innovative things that would make higher impact (see section 7.2.1). These high growth SMEs at scale-up phase offered an attractive opportunity for collaboration.

Working with small and medium sized enterprises (SME) bought richness of knowledge and the agility to achieve rapid results, however this required a need from the universities to balance higher levels of risk, time and effort invested. Flexibility of support is a clear theme in working with SMEs, providing ease of access to the universities was vital and minimising barriers to engagement (see case study 5 for innovation voucher schemes and innovation advisors). Providing a strong human infrastructure of support (i.e., from programme leads and innovation advisors), easy access to the right academics and responsiveness proved to attract SMEs (particularly ones with high growth potential). To communicate this message, short bursts of purposeful campaigns were used to demonstrate readiness, ease of collaboration and ultimately attract SMEs. When working with SMEs, projects were in some ways driven by the SME’s needs and therefore offers had to be applied flexibly for successful collaboration.

Case study 8: Flexible offer to increase volume of SME collaboration

To match the industrial complexity of the space sector where many smaller companies deliver a lot of activity, to create impact SPRINT focused on engaging a high volume of SMEs who were in or wanted to be in the space sector. By keeping a broad definition of space economy, SPRINT were able to diffuse their IP, technology and skills to support the growth and sustainability of diverse SMEs ranging from tangible space products to assets such as space data, regulation and law. Through flexibility SPRINT supported the journey of 110 buisinesses,140 projects and generated over £24m in external funding. Recognising the challenge of universities working with SMEs sprint used “innovation voucher schemes” to meet the challenge of rapid turnaround, providing increased support and holding frequent open call. Alongside this, their innovation advisors (see case study 5) assigned to regions increased interaction with SMEs.

Generally, targeted funding calls, advertising, and raising awareness through marketing and leveraging existing networks were utilised to get exposure to find and collaborate with SMEs. Running training at scale, so called “innovation workouts” supported SMEs in understanding the value-add from university collaboration. This was an effective approach to encouraging SMEs to understand how they could work with academia to extract value for their business.

As with wider industry companies, tailoring language and appropriate communication was particularly critical such as using business-friendly language rooted in access to finance and collaborative R&D resources. Utilising institutions such as business support organisations who sit in between the academic and commercial environment were also useful in finding and working with SMEs.

Case study 9: Leveraging marketing to attract SMEs

Clean Growth also took a broader approach to collaborating with a large number of SMEs. Rather than being sector specific, Clean Growth made use of diverse opportunities to transfer university knowledge and funding to enable the transformation needed for net zero and a sustainable economy. Clean Growth used a membership model and powerful working in partnership with other business and local authorities to co-host events these were used as hooks to draw in SMEs (see case study 11 for more).

7.1.3 Engaging with academic partners

Networking events, conferences, employment or secondment of students and researchers (including early career researchers), and joint collaborative research projects were used to engage with academic partners (see section 9). Similar incentives to engage industry partners were sometimes also used to engage academic partners such as providing triaged opportunities to work with industry, running similar

commoditised programmes for academics and involving academics in solution ideation to industry challenges. Making collaboration with academic partners a non-negotiable part of project selection was also effective in putting engagement of industry and academia at the core of the process.

As with engaging with industry partners, when communicating with academics a key learning was to change the language and communicate in a way that makes collaboration purposeful and driven. It was noted that guiding researchers with significant support was key as they were doing something different to their normal skills and ways of working. Providing feedback was important to ensuring that academics could develop their ideas, and reconnect with industry when they were ready.

Engaging with academic partners was interpreted broadly to include engaging with entrepreneurial student talent which was effective in bringing momentum and a good culture of innovation. Successful engagement with academic partners was driven by the culture of the university which determined levels of engagement. Universities that were teaching intensive, and more outward facing, which were already engaged with industry and the local area were found to have a wide pool of academics willing to collaborate. A vital but difficult challenge in engaging with academics was on aligning university and industry timescales and processes.

7.1.4 Assessing which projects to support

Assessing which projects to support required significant collaboration between HEPs and industry. Collaboration was used as a criterion for project selection or as part of the process for assessment. Generally, assessments were focused on finding the right companies to benefit and relied more on their commercial due diligence. Standard triaged evaluation processes, scoring systems and set criteria to judge against including; value to business, benefit to the region and likelihood of product success.

Across the programme, selection panels often included a mix of external and internal leads, and this external support and domain expertise was useful to provide technical appraisal. Their knowledge and understanding of commercialisation and entrepreneurship were also key in assessing which projects to support.

Working in collaboration with internal and external partners was necessary for decision making, particularly to shift the thinking from grant consensus to making decisions around innovation which is often unpredictable. This required decision makers to have the ability to take risk and recognise opportunity. Therefore, not just skill or expertise but a different mindset was needed on the investment committee. Relying on external support and finding the right people with the right skill and mindset for the selection process was important. To achieve the right mix when assessing projects across the programme, networks were leveraged as broadly as possible. For some sectors this required a more proactive approach to find the right committee members that bought in a diversity of perspectives (see case study 10). In addition to this, instead of focusing on aggregates of scoring, the use of triangulated views and collaboration during the selection process provided the depth of discussion needed to make decisions about innovation.

Case study 10: Enhancing inclusion in the selection process

SWCTN took an inclusive approach to selection, and worked on balancing the cohort to get the right mix, with inclusion and diversity. They used in-depth interviews with representatives of potential beneficiaries on the decision-making panel. Recognising the need to diversify types of applicants, Pitch-In tailored KPIs to shift the emphasis on inclusion and remove barriers. Similarly, to increase inclusion Clean Growth were open to work with any company and mainly ran screening processes to check market need for the product or service.

7.2 Marketing and branding

Commercialisation activity in marketing and networking opportunities was seen as key to support commercialisation across the programme[3]. Open calls for "public" pitching of projects utilising marketing to attract potential applicants was trialled as a method to boost awareness, but did not attract as much interest as expected. Other mechanisms were applied in order to manage relationships and networks, such as the use of external marketing companies to manage information and campaigns, CRM systems and websites to streamline application processes. Running consultation training offers (such as "innovation workouts mentioned in section 7.1.2) and special deals were also used, as well as google ads, membership manager, cold calling and buying data externally to target wider audiences. Ultimately no single method could be said to be most useful, as an approach using multiple routes to marketing was seen to be most effective.

Case study 11: Using a membership model to create a network and brand offering

Clean Growth uses a free membership model to build and create a network. Regular communication such as newsletters and social media are delivered through this community of about 2,500 and growing. Clean Growth has a clear business facing productised service offerings such as workshops and events which has allowed them to build an engaged community with multiple innovation activities between universities and industry, but also B2B. Clean Growth's branding, values driven purpose and messaging (i.e., are you on a mission to tackle the climate crisis?) has supported in creating emotional buy-in and strong brand identity. Events are an important part of this mix as they generate referrals through complementary business support organisations. Alongside branding and marketing, Clean Growth utilise a shared CRM and annual business survey feds which them to track KPIs. To see more visit https://www.clean-growth.uk/

[3] 10 out of 14 CCF projects who responded to our survey had engaged in marketing and networking activities

8 Sector specific approaches

The graphic in section 4 illustrates the range of sectoral specialism and technology focus that was adopted by at least 11 CCF projects (61%), whilst others also included elements of industry focus within a broader remit. Most of these were driven by the needs of the specific industry sector, which typically led to a multi-disciplinary approach and engagement with a wide range of researchers. Finding experienced sector-specific intermediaries is key to supporting these interactions. Without individuals with deep knowledge of the industry sector and broad networks, it is much more difficult to broker relationships and ensure that projects are built on a good understanding of the industry needs. The role and knowledge required of these individuals varies depending on sector, for example, one CCF project in the creative industries learnt that the role of creative producers was essential to support their programme delivery, as outlined in case study 12.

Case study 12: The role of the producer in creative R&D

SWCTN employed Creative Producers to create the conditions for innovation. This worked from the premise that a creative mindset values imagination and different ways of thinking. These individuals curated, linked, prompted and supported personal and project development. They used a way of testing things through inventive experimentation, and an applied resourcefulness that facilitated the trick of turning nothing into something.

Although a wide range of industry sectors were chosen, the basic activities and engagement mechanisms employed by the CCF projects showed significant similarities. Use of PoC funding to develop products and collaborations is common, as is training and upskilling. The differences showed themselves at the next level of detail. For example, many of the training programmes for these CCF projects included specific modules relating to their specific industry; one CCF project included events that looked at policy aspects of “healthy ageing”, whilst another had specific training on how to prepare for CE marking, and developing medical device products in line with ISO13485.

Other differences between the sectors relate more to how the researchers and industries think about their work and ensuring that language is used that resonates with all the participants. Technology transfer and commercialisation activities have historically been more associated with STEM subjects, and the CCF projects that worked in the social and creative sectors had to adapt this approach to focus the narrative more onto developing collaborative solutions to real-world problems. Sector also influenced the type of industry partner, and in some industry sectors the CCF projects were predominantly working with local SMEs, reflecting the company demographics of these industries, whilst other sector CCF projects had a broader spectrum of company size and location.

Another common learning was the importance of including relevant stakeholders in the projects and processes. This might be by using academic clinicians to involve the NHS in healthcare projects, or bringing together creative researchers with technology solutions, or putting patients at the heart of med-tech project development.

One advantage to a relatively narrow industry or technology focus is that it is typically easier to identify and engage with their industry stakeholders than if a project is attempting to address a broad sectoral approach. The commonality of both the industry challenges and the researcher expertise makes it much easier to make connections and build an engaged community.

9 People and ecosystems

People and ecosystem development is at the heart of successful innovation and commercialisation. Being led by the strengths of local places, the leveraging of networks and upskilling of various stakeholders was enabled by CCF (whether intentional or not) and occurred across several projects. In most cases, varying forms of effective training efforts took place to develop entrepreneurial talent, especially for academics.

9.1 Developing entrepreneurial talent

9.1.1 Course content

Formalised training was a key part of the programme. Courses focused on developing skills and knowledge of four main stakeholder groups; academics (including early career researchers), industry professionals, SMEs and in some cases students. Training and course content was most effective when driven by real purpose, specific and meaningful to the stakeholder group (see table 1 below for examples of tailored content covered). Content had to consider the perspective and motivation of these stakeholder groups to ensure knowledge and skill training felt relevant and beneficial.

Table 1. Stakeholder groups and the purpose of content

Academics and early career researchers

- Developing knowledge and deeper understanding into commercialisation was key to supporting academics.
- Building softer skills i.e. increasing confidence in business engagement to support collaboration with industry and investors (particularly when talking about finances).

Small and mid-sized enterprises

- Increasing awareness of how SMEs could collaborate with academia was vital to bringing SMEs onboard.
- Holding masterclasses for SME potential candidates focused on building knowledge in the business value of collaborative R&D for mutual benefit.

Industry partners

- Developing knowledge and how to apply research and engage with universities.
- Use of new product design methodology.

University students

- Including students to fulfil short-term academic support roles during delivery phases helped by simultaneously upskilling them.
- Some projects included an element of student entrepreneurship into their projects

Commercialisation can often be a new concept for academic communities, networks, students and early career researchers (particularly those focused on humanities and social sciences). Skills training in commercialisation, entrepreneurship and business engagement was fundamental to creating confidence to encourage collaboration and working in unfamiliar environments. Training helped create a shared understanding of language to support effective business communication. Many thousands of hours of training in this area were enabled by the CCF programme and delivered across projects to thousands of individuals and institutions. To accelerate knowledge in commercialisation and entrepreneurship, mentorship programmes were useful for early career researchers to provide continued support rather than one-off courses. Mentorship, although with less structured content, allowed for flexible support, reflective practice and development.

Interestingly, “learning by doing” is perceived as one of the most effective forms of talent development. Development driven by shared purpose and enabled by CCF projects meant learning was broader than training materials. It is key to note skills and knowledge is not just acquired through training courses and the real value was driven from training by-doing. Though training courses had merit, real value was

derived from effectively and consciously embedding learning into the doing. Reflectively learning from failures was a part of this process and redefining the story of what success looked like by making failure a step to future success rather than an endpoint. To ensure training by-doing or experiential learning happened there was a focus on getting as many people as possible to contribute, in order to allow more people to get real exposure and understand what they were doing in context of others. This moved course content from being theoretical into the practical knowledge and skill developed from practice.

When developing entrepreneurial talent, a focus on evaluating development supported in understanding the extent of growth in knowledge and skills achieved. A programme evaluation methodology, measuring from start, middle and end on entrepreneurial readiness, measured every 6 months for early career researchers helped monitor progress and track impact from direct work and beyond.

9.1.2 Course delivery methods

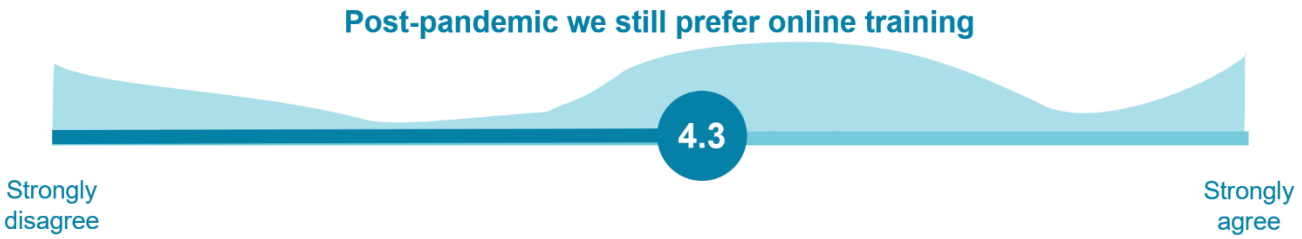
Using a mixture of course delivery methods was essential, and this became increasingly more apparent as the programme moved to utilising more remote solutions due to COVID-19 isolation restrictions. The advantages and disadvantages of using online versus in-person delivery methods were already well recognised. The pandemic drove a search for and use of more innovative delivery methods (see figure 4). There was a fundamental shift in thinking towards more efficient, effective and innovative ways to deliver courses, rather than focusing on half or full-day delivery, projects looked at creating immersive learning experiences (such as hackathons, role play and training by doing). Typically, a blended approach to delivering courses was seen as best practice to ensure flexibility and accessibility, for example having in-person training but using online tools for 1-2-1 follow-up conversations. In deciding which method to use it was worth considering; market segment and delivering based on market needs, geographic goals, the needs of participants (following the pandemic many preferred online training, including time poor SMEs), efficiency and experience.

Types of course delivery methods

Delivery method depended on the overarching objectives of training. Some were more structured, timebound and live, whilst others had made self-study materials available, or a combination of all of these. Different types of delivery methods included:

Type of training	*When this was most effective*
• **In-person:** face-to-face engagement	Networking opportunities and sessions which require high engagement
• **Online:** using virtual online tools without shared physical spaces	Increase in potential audience reach, flexibility and overall participation
• **Hybrid:** utilising both virtual and in-person spaces simultaneously	Courses with a mix of both in person and online activities, this included 1:1 online follow-up after in-person training
• **Self Service:** online learning that can be accessed as and when needed, pace driven by participant	Used for bite-size training modules, works well with managing workload, can be fitted around teaching and other responsibilities
• **Mentorship:** tailored support through coaching and 1-2-1 conversations driven by the mentees	Accelerating learning and used for exceptional candidates
• **External:** training delivered by external providers and partners	Used to develop specific skills by bringing in experts, or facilitate specific events
• **Internal:** delivered by internal CCF project leads and partners	Tailored to specific CCF project environment
• **Hackathons:** focused solution driven sessions	Framed around real-world problems and collaborative challenge

Figure 4: Summary of reactions from participants in the CCF event to the statement "Post-pandemic we still prefer online training" on a 7-point scale from Strongly disagree to Strongly agree.



When considering the experience of participants, forming cohorts created a shared learning journey. Approaches to also measure development of entrepreneurial skill and knowledge of cohorts provided a valuable view on impact of training. Importantly, high quality of training and continuous iteration and reflection was vital to successful delivery. Utilising training providers was a mechanism for pulling in expertise and high-quality delivery of courses (see case study 13).

Case study 13: Bringing in external skills partners to create a training hub for academics

Northern Accelerator used external skills partners to deliver an Ideas Impact Hub to provide training for academics and early career researchers. They offered two levels of in-depth training focused on developing knowledge in IP creation and driving impact from research These were;

- Innovators programme: primarily aimed at early career researchers, and delivered in partnership with Skillfluence, experts in upskilling researchers to work with others to maximise the social and economic impact of their work. The programme offered innovation, enterprise and impact training to help academics realise real-world impact from their research.
- Future founders programme: delivered in partnership with innovation and venturing specialists Zuas and focused on the knowledge, understanding and commercial skills academics need to establish successful spin-out enterprises or licensing opportunities. An element of this programme was focused on learning by doing, including proposition training.

Northern Accelerator was successful in engaging 25% of trained academics in spin-outs created.

9.2 Cluster and local ecosystem development

Developing local geographic regions became a natural and organic focus across some projects and was a stated ambition for others. Being guided by the sector strengths of local ecosystems provided a good foundation for projects to build on and accelerate their aims. Engaging local partners included working with local authorities and regional corporate leads on boards and panels, as well as linking up with other similar networks and clusters (see case study 14). Investing in supporting local companies and spin-outs

from partner universities that benefited a particular region was one way of engaging local partners. While leveraging existing local ecosystems, projects were also able to enhance these local ecosystems by connecting them and sharing learnings across broad networks. As with industry engagement, these clusters and ecosystems depended heavily on marketing and engagement activities to build and strengthen the interactions. As well as traditional options such as newsletters, blogs, websites, events, and social media, some more imaginative approaches included YouTube videos, exhibitions, and even games.

Case study 14: Building awareness of a cluster

THYME was regionally focused on raising the profile of bioeconomy in the North East. They used creative techniques to raise awareness of the region and involve the talent within academia and industry. THYME looked at building university capabilities in the region and used outreach to work with schools. They formed a Bioeconomy Outreach Centre and developed an online map to build awareness of the cluster. To strengthen their cluster, THYME joined up with overlapping clusters such as BioVale, NEPIC, CATCH, BioYorkshire, and local net zero projects.

Projects that relied on specific subject matter expertise on niche topics focused on nationwide cluster development as opposed to specific regions, building up the ecosystem around the technology focus, rather than the geographic area. In the second round of funding, some of the projects expanded their initial partnerships to a national scale. The parameter of funding being kept to England created some artificial barriers to growing wider ecosystems. There is a desire to partner on a National UK level and expand internationally to further diffuse innovation. Partnerships have been formed beyond the confines of England, to include universities in Scotland, Wales and even the Netherlands, when purpose and ambitions of regions aligned.

10 Managing ideas and knowledge

Across all the CCF projects, there were a range of learnings that were identified about broader good practice in running and managing collaborative projects of this scale and scope.

10.1 Governance

The overall governance structures for projects of this scale should be set up as early as possible, and where possible involve senior university management. A few CCF projects reported that they failed to do so, and regretted this, either because it caused delays, or because the project suffered from a lack of senior leadership support in later stages. Clear direction from senior management engagement is very helpful, and at least 4 CCF projects also got huge support from the enormously valuable input they received by including external opinion leaders in their strategic advisory boards. One CCF project recommended that this is kept simple – one operational management group, and one strategic board. In their case, they had a more complex structure with too many boards with overlapping responsibilities, which proved to be unwieldy.

10.2 Project management

As with the overall governance, there are benefits to building the project management structures and approaches as early as possible, ideally a few months before the official project launch and start of activities. Many CCF projects found that a full-time project director or project manager was an essential role to ensure that the project remained focused and on track. As discussed previously, having dedicated CCF-funded staff at each project partner was mentioned by at least 5 projects as being essential to the success of their project, whilst others found that involving internal marketing, communications and PR staff into the project team made dissemination easier. These people seemed to naturally form into teams through the process of running the project activities together, even if they were geographically separated. The experience of lockdown enhanced this, by proving that it is possible to build strong teams using video-conferencing and other tools to strengthen communication.

Several of the CCF projects developed support materials such as project management manuals, Standard Operating Procedures, or project planning tools which were shared amongst their CCF project members.

One success of the early cross-CCF events was a shared exploration of how State Aid applied to these projects; this was reported as a challenge for at least 7 of the CCF projects. Some of these have now updated their thinking on this aspect for the post-Brexit regulatory environment.

10.3 Co-ordinating IP policy and processes across a CCF

Two or three of the CCF projects started with an ambition to align their policies and processes, and provide a “single front-door TTO”. However, in reality, these all concluded that this was not an appropriate goal, and ultimately none of the projects adopted a common IP policy.

Most of the CCF projects now believe that standardisation is not the way to go, as each organisation will have its own history, motivations and established processes. Their policies reflect their individual circumstances in terms of the underlying research base, the vision of the university, their approach to generation of impact from their research, their partners and local environment, and the resources that they have available. A much better approach was to use the CCF project structure as a sounding board, allowing HEPs to adapt their existing approaches through alignment and sharing of best practices. There are many benefits from building a close-knit cross-institutional team which shares experiences. In some cases, further alignment may also be driven by each organisation evolving in response to external pressures, for example to fit the requirements of an investment vehicle.

Other successes in bringing processes together were seen in harmonised approaches taken to project evaluation, or the introduction of a common stage-gate approach to monitor the progress of opportunities against clear milestones. One CCF project used the approach of the most experienced CCF project partner as a template, with the other partners adopting similar processes, adapted to their specific circumstances.

10.3.1 Use of standard templates and agreements

There was a more mixed experience when it came to the use of standard templates and agreements. One CCF project introduced a procurement framework that they found really helpful, suggesting that

they should have done this earlier in the project. Other CCF projects successfully shared their approach and knowledge about spin-out legal agreements and approach to equity shares across their CCF project partners. Another CCF project developed a standard collaboration agreement which they used successfully for most of their industry-academic projects. Because it had already been approved by all the universities in the CCF project, it was easier to get industry to agree to the terms.

On the other hand, standard agreements can meet with resistance, in particular from potential industry collaborators or investors who insist on the use of their own templates, but also to a lesser extent from the HEP partners who already have their own established precedents and processes in place. In these cases, a common framework or approach to negotiation can prove more tractable.

For projects which are led by industry, and where they are bringing the project ideas and background IP into the collaboration, it can sometimes be helpful to take a deliberately light touch to the approach to access to IP and expertise. This ensures that arguments over IP do not get in the way of starting projects with industry, but still retains the potential for future sharing of the benefits of the project outcomes. This approach is not appropriate in all circumstances, particularly when the initial project ideas and knowledge come from the university, rather than from the industry partner.

10.4 Dissemination

Several of the CCF projects have developed tools, reports, videos, presentations and blog posts that can be used by others to learn from their experiences of trying different approaches to commercialisation through their projects. As described in case study 15, some made this a core activity for their project. Several others have also published materials on their websites, and the PET will be exploring ways to ensure that this material is both preserved and disseminated as widely as possible. These materials included a series of guides[4] for KE professionals to maximise innovation success particularly in medical technology development, covering topics such as how to run a proof of concept fund, building an effective multi-partner collaboration, and developing great innovation funding proposals. These written or recorded materials have been supplemented by presentations at conferences and workshops. Another useful approach was to run commercialisation workshops across the CCF project members, which explored practical topics, such as how to engage with brokers, how to run KTPs, or how to involve students in projects and placements.

Case study 15: A toolkit for commercialisation of SHAPE projects

Aspect

The ASPECT CCF project has developed multiple resources which are shared on its website exploring the “how to” for commercialisation in the social sciences. This was an integral part of the project, and they have also expanded their dissemination efforts in other directions – bringing multiple additional partners into the CCF project, and forming communities of practice to share experiences relating to Technology Transfer, Business engagement, Student Enterprise, and Communications.

As discussed above, many of the projects also found that more informal sharing of experiences and practical hand-on support for partners who are newer to commercialisation was a central benefit from their project.

Some of the training materials developed during the programme have also been disseminated and shared more widely, for example by re-using them in other internal projects, or by sharing with others, for example one CCF project has produced training materials for nurses and other healthcare professionals which are available on the NHS Education website.

[4] https://growmed.tech/the-bulletin/

On a more practical note, some of the initiatives developed by the CCF projects have proved so successful that they have been replicated elsewhere, as outlined in case study 16.

Case study 16: Replication of "Executives into Business"

The Executives into Business programme developed by Northern Accelerator, forms a key part of the spin-out support process for this CCF project enabling them to bring experienced CEOs in to support their pipeline of spin-out companies. This programme has been shared and expanded and disseminated through multiple routes – first by educating the original CCF project members Northumbria and Sunderland, then by adoption of the programme by the Scale-Up CCF project, and now by the expansion of the CCF project to Teeside and York. This is a good example of an approach that has evolved during the CCF project from an earlier pilot approach, to being refined to suit the needs of the CCF project and support the development of their spin-out pipeline, and which has subsequently been recognised by others and replicated to support spin-out development in multiple different situations.

11 Future directions

Alternative funding

The sections above outline some of the learnings to emerge from the CCF programme regarding useful approaches to commercialisation and when these can be applied, as well as some that do not work as effectively. Sustainability of the projects beyond the end of the programme has not been explored in detail in this review, but some conclusions can be drawn about what may be possible, and what is more difficult when seeking alternative funding sources to continue to evolve some of this activity.

Breaking down the activities into smaller discrete activities that could be funded in different ways is likely to be possible for some, including using internal university funding from HEIF or other sources to support these. The most common requirement for such internal funding is to continue to support project director or project team member positions. The successes of CCF project outcomes can also be used to develop the existing partnership structures to leverage further funding from others that have a vested interest in similar outcomes in terms of commercialisation and innovation such as LEPs, the Research Councils, as well as other Research England funds.

The funds used to support proof of concept activities are likely to be the most difficult to replace, and is an area where there is a lack of alternative funding sources. Perhaps this type of funding will always need to be subsidised, as it is inherently “grant-like”. Even where projects may be able to recycle funding back into their activities in the future through successful returns from their projects, timelines involved are typically longer than the 3-5 year span of these projects. For example, IBbD is just beginning to receive some returns from products that were developed through their support, and the venture funds established by Northern Gritstone and Northern Accelerator have already begun to support additional proof-of-concept projects.

Industry sectors

The overall CCF programme covers a wide spectrum of different industries, including a number that were previously prioritised by the government’s Industrial Strategy (2017). Some projects took a more sector-agnostic approach, but several others focused onto a very specific area, such as anti-microbial resistance, or cell and gene therapy. Many of these were in the health and life sciences sectors, rather than materials/AI/electronics and photonics/energy/smart technology. This means that there are still several industry sectors and specialisms that could be identified where a combined approach which brings together the expertise across more than one institution remains to be explored. Deep tech was identified as one potential area which has not yet been addressed by the CCF programme, and where translational support is needed as significant amounts of funding to carry out real world experiments is required.

Geographical coverage

Geographical coverage of the projects was also interesting; there are advantages to starting small and local, but some of the projects have ambitions to expand their networks of expertise nationally, or across the UK, or even internationally. The funding constraints of the programme influenced what was possible through the CCF, but there could be advantages in finding mechanisms to expand these horizons to build critical mass in specific subject areas. Industry does not care where an idea was generated, as long as it fills a need for them.

Types of commercialisation support

Several different areas of commercialisation activity have been explored during the programme, with spin-out support, building investment funds, and developing collaborative research projects with industry receiving particular attention. There are other aspects which did not receive the same focus or where good solutions have yet to be identified. One challenge which has not yet been fully explored is how to engage with large industry partners. There were some examples of large company involvement, but more of the projects focused on SMEs, which probably reflects a combination of greater need in this group, coupled with an agility which fits with the project timelines, and the ability to make a big difference with relatively small amounts of funding. As was mentioned above, there was also a greater emphasis on spin-out support than on licensing across the programme. Student entrepreneurship was touched on by some projects, but was deliberately not a priority for the overall programme. Work placements/project experience, consultancy, patenting, and contracts and legal support are areas which have been less well explored and/or where challenges remain when taking a collaborative approach.

Communities of practice began to emerge during the CCF programme, and would probably have developed further were it not for the impact of lockdown, which forced the projects to focus more on short-term challenges with project delivery. These were found to be very valuable, and can also be seen to be emerging elsewhere through initiatives from PraxisAuril and TenU. Support structures which can encourage these opportunities to share good practice and build trusted relationships are very useful, particularly if they can also link into other relevant stakeholders, such as the Catapults, the investor community, regulators, etc.

Finally, a continued challenge across many universities is a lack of experienced commercialisation support staff. These individuals were repeatedly identified as being crucial to effective delivery of the projects, but very difficult to find, which suggests that improved training, mentoring and career paths are still required to attract and retain more candidates. Some projects explored the potential for sharing BDMs and TTOs across institutions, and managed to make this successful by selecting people with good sectoral knowledge and the willingness to work across all the partners. The CCF projects provide a good structure for this, by putting the needs of the project ahead of those of its individual institutions.

12 Conclusion

The CCF programme has funded a range of different projects which all faced different challenges, and developed specific solutions for their particular needs. These provide useful learnings which can be adapted for re-use in other situations. Listening to other's experiences and applying this knowledge elsewhere was found to be extremely valuable. Projects which combined expertise in a specific industry or subject area from multiple universities found that there were benefits both from achieving critical mass, and from sharing of specialised staff with industry insights and networks. The programme also allowed different projects to experiment, for example testing different mechanisms to set up and run a university venture fund, which each have their own benefits and drawbacks.

Use of proof of concept funding to develop commercialisation opportunities has been identified as a near-universal requirement, and something that the projects have found challenging to fund from other sources. Entrepreneurial training and upskilling are also common requirements, and more could perhaps have been done to ensure that good training approaches were shared between the projects, rather than recreated each time. Training courses are only part of the picture, however, and mentoring along with "learning by doing" are also key mechanisms to upskill participants.

Another common learning point is the importance of listening to industry, where seeking stakeholder input on real-world problems seemed to be more successful than more passive, research-driven approaches. A number of different and interesting approaches were tried to ensure that industry, NGOs, policymakers, and end-users helped to shape the commercialisation opportunities that were selected for support.

Finding the right people to support commercialisation activity is both essential and an ongoing challenge. Subject area specialists with broad networks are vital in sector-specific CCF projects. Experienced or well-trained individuals are needed to drive spin-outs. Generally, there is a perceived need to increase the pool of well-qualified, well-trained TTOs and BDMs through enhanced training, mentoring, and career pathways that will encourage talented individuals into the profession.

Overall, this review has uncovered plenty of evidence of valuable outcomes from the CCF programme, and of the sharing of learnings and dissemination of good practice. The future activities to be carried out by the PET are expected to continue this process of exploration, and spread these learnings further afield.

Appendix 1: Project abbreviations

The abbreviations used for the individual CCF projects are as follows:

Abbreviation	Full Project name
Advanced Therapies	London Advanced Therapies/UK Advanced Therapies
ASPECT	ASPECT (A Social sciences Platform for Entrepreneurship, Commercialisation and Transformation)
Bloomsbury SET	The Bloomsbury SET: Connecting Capability to Combat the Threat from Infectious Disease and Antimicrobial Resistance
Ceres	The Ceres Agritech Knowledge Exchange Partnership
Clean Growth	Clean Growth UK
EIRA	Eastern ARC 'Enabling Innovation: Research to Application'
Grow MedTech	Grow MedTech: Collaborating for a Competitive Future
IBbD	Impacting Business by Design
MICRA	Midlands Innovation Commercialisation of Research Accelerator
MTSC	MedTech SuperConnector
Northern Accelerator	The Northern Accelerator – Integrating Capabilities in the North East
NTI/Northern Gritstone	Transforming UK IP Commercialisation Through Collaboration in The North of England: The Northern Triangle Initiative
Pitch-In	Promoting the Internet of Things via Collaborations between HEIs & Industry
Scale-Up Programme	SETsquared scale-up programme
UK SPINE	UK SPINE KE: free flow of knowledge to accelerate innovations in ageing
SPRINT	SPRINT (Space Research & Innovation Network for Technology)
SWCTN	South West Creative Technology Network
THYME	THYME Project (Teesside, Hull and York - Mobilising Bioeconomy Knowledge Exchange)

Appendix 2: Interviewees

Project	Interviewees
Advanced Therapies	Prof Simon Howell – Project Lead and grant holder Francesca Gliubich – Director- London Advanced Therapies
ASPECT	David Coombe – Director of Research and Innovation at LSE David Ai – Head of Innovation at LSE Hamish McAlpine – Principal Consultant at Oxentia
Bloomsbury SET	Emma Tomlinson – CCF partner lead RVC
Ceres	Iain Thomas – responsible for communication between the project and the lead University Louise Sutherland – Project Director
Clean Growth	Zoe Osmond, Director Clean Growth UK
EIRA	Kirstie Cochrane – EIRA Director
Grow MedTech	Jo Dixon-Hardy - Director
IBbD	Guy Bingham – Prof of Design at DMU and project lead
MICRA	Simon Jones – Lead Project Manager
MTSC	Simon Hepworth – Director of Enterprise at Imperial College
Northern Accelerator	Tim Hammond – Project Lead Edwin Milligan – Project manager
NTI	Andrew Wilkinson – UM Innovation Factory CEO, CCF lead
Pitch-In	John Clark – PI and academic lead for the project. Professor of Computer and Information Security at the University of Sheffield
Scale-Up Programme	Simon Bond, SET Squared Innovation Director and CCF Lead
UK SPINE	Harriet Teare – Program Director
SPRINT	Martin Barstow, SPRINT PI and Director of the Leicester Institute of Space & Earth Observation
SWCTN	Jonathan Dovey, Professor of Screen Media on Dept of Creative Industries, Director REACT (Research & Enterprise for Arts and Creative Technologies)
THYME	Penny Cunningham - THYME Project Bioeconomy Operations Director Joe Ross – Director, Biorenewables Development Centre

Appendix 3: Interview discussion guide

The guide below was provided in form of a PDF to all 18 CCF project interviewees in advance of the meeting. This guide was then used by the interviewer to carry out semi-structured interviews.

1. Introducing your programme

- Brief introduction to the aims and activities of your CCF project, and your role in the project
- Which of the following types of KE activity are included in your project (please share any best practice from these):
    - The creation of specific patient capital/university venture fund
    - Putting in place an IP pipeline and co-ordinating IP policy and processes across a collaboration.
    - Marketing and networking R&D opportunities between universities and industry (specifically aimed at SMEs or more general?)
    - Developing academic and other entrepreneurial talent
    - Cluster and local ecosystem development
    - Sector specific approaches

2. Generation of Support Materials

We will provide an MS Forms questionnaire following the session for you to provide example docs, providing any additional learnings here.

- What support materials have been generated throughout the course of your CCF project?
    - Training materials and courses (who are these aimed at? To what end?)
    - Brochures and guidance (context & content)
    - SOPs and approaches used by the CCF project (specify)
    - Where are these stored. How can we get access to them (including how we can collate materials that have not been made public)

3. Best practices emerging in specific activity areas

Project specific priorities – are any (1-2) of the below of specific interest to your project?

- Insights gained from the project that provide lessons for universities/research base more widely. What have you discovered that works well, and what have you tried that does not work, relating to:
    - The creation of specific patient capital/university venture funds. The different approaches and models that have been trialled in the programme.
    - Barriers and opportunities from legal/regulatory frameworks and partnership arrangements – particularly with investors.
    - Putting in place an IP pipeline and co-ordinating IP policy and processes across a collaboration.
    - Marketing and networking R&D opportunities between universities and businesses/SMEs. Effective branding and understanding user needs.
    - Developing academic and other entrepreneurial talent. Skills, training and experiences. Partnering with accelerators and incubators and other providers of specialist expertise.
    - Cluster and ecosystem development and defining and engaging regional/local priorities and partners.
    - Industrial/tech sector variation – differences of approaches, partners, policies and processes.

4. Best practice relating to All projects

- Insights gained from the project that provide lessons for universities/research base more widely. What have you discovered that works well, and what have you tried that does not work, relating to:
    - Evaluating and impact assessment/measurement

- Challenges of large-scale, collaborative and project working. Managing legal/regulatory factors, collaboration agreements, value of standard/template agreements & technology/industry specific approaches, policies and practices.
- Understanding, identifying and disseminating "what works" in commercialisation/working with business.
- ROI, specifically private leveraged amounts (only) in addition, to all leveraged funds. *See questionnaire*
- Sources and conditions of sustainability. Understanding funders and opportunities from users of services. Delivering HE institutional value from a collaboration. Sustainable business models in commercialisation.
- Other best practice learnings

5. Dissemination

- What have you done during the project to disseminate the learnings on KE practice that you have gained?
    - Within your CCF
    - More widely
    - How have you/your partners changed your policies as a result of the CCF?
    - How have you/your partners brought new approaches into non-CCF KE activity?
    - How have you changed KE policy & practice more widely as a result of the CCF project?
    - What has not worked?

6. Conclusions

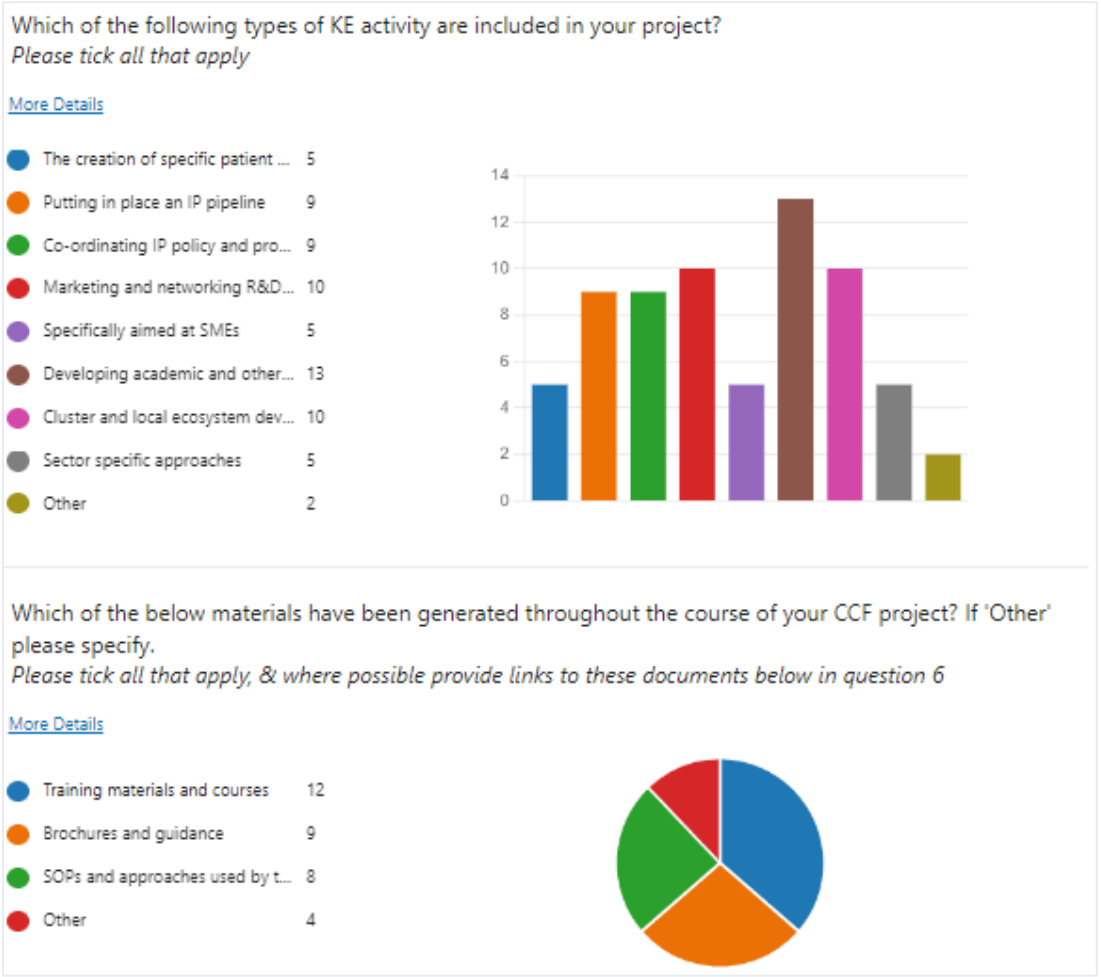
- What went/ is going well, what would you like to see more of from the CCF programme, and what could be improved on?
- What have you achieved through your CCF project that would not have been possible without the CCF – what difference has it made?
- Gap analysis – are there areas of KE and commercialisation support that you would like to have tackled in your project, but did not manage to achieve? Are there areas that you think are missing from the range of CCF projects that were funded?
- Are there any other areas that it would be useful to explore (e.g. to feed into the later reports)?

Appendix 4: MS Forms

Total of 14 out of 18 CCF projects responded to the MS Forms survey. The survey was kept open for 3 weeks to gather response while interviews were being completed. List of CCF projects who have responded:

- SPRINT
- MedTech SuperConnector
- Bloomsbury SET
- Ceres Agri-tech
- CCF/NTI/Northern Gritstone
- UK SPINE
- Clean Growth UK
- UK Advanced Therapies
- Enabling innovation: Research to Application (EIRA)
- Northern Accelerator
- SETsquared Scale-Up Programme (formerly SaSSE)
- Aspect
- THYME
- Midlands Innovation Commercialisation of Research Accelerator (MICRA)

Detailed results are shared within the report in the relevant sections.



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