Driving Research and Innovation

Summative Assessment Report (DRAFT)

April 2023

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Executive Summary

The Driving Research and Innovation (DR&I) project, part funded by the European Regional Development Fund (ERDF), provided direct support to Derbyshire and Nottinghamshire Small and Medium-sized Enterprises (SMEs) across the D2N2 geography[1] to improve their innovation culture and productivity. Delivered by the University of Nottingham, the project utilised the knowledge, expertise and facilities of the following three centres / hubs within the University:

- Chemistry Innovation Laboratory (CIL)
- Food Innovation Centre (FIC)
- Precision Manufacturing Centre (PMC)

Delivery was bespoke to each individual SME, but primarily included a blend of the following:

- Initial review and diagnostic
- Provision of consultancy support, including literature reviews and research
- Technical work (including the use of specialist equipment and technology)

Part-funded by the European Regional Development Fund (ERDF), DR&I's Managing Authority was the Ministry of Housing, Communities and Local Government (MHCLG).[2] The project officially commenced on 1 January 2020 and is due to complete on 30 June 2023.

This summative assessment report is a requirement of ERDF funding and is based upon specific guidance provided by the MHCLG.[3] The assessment was based on a range of research methods, including: documentary and data analysis; 11 detailed interviews with project stakeholders; 10 individual interviews with participant SMEs; 41 responses by participant SMEs to an online feedback survey, and a review of additional participant feedback collected by the DR&I project team.

Headline message

The DR&I project provided highly bespoke support to SMEs across Derbyshire and Nottinghamshire, incorporating a combination of high-level expertise and access to specialist equipment and technology. The quality, intensity and longevity of this support was extremely well received by participant SMEs, leading to significant and wide-ranging outcomes – and fostering enhanced and sustainable collaborations between SMEs and the University. The project clearly met its original objective to 'increase participation and engagement in research and innovation activities by D2N2 SMEs'.

Despite the overall positivity regarding the project, from an ERDF-output perspective it failed to meet the majority of its original targets, particularly those linked to the *volume* of participants. This was primarily a result of the Covid-19 pandemic's impact on demand for innovation support, but was also reflective of the substantial and in-depth one-to-one support delivered by DR&I – which, although providing significant benefits to the businesses, was less aligned to the ERDF targets.

[1] D2N2 is the Local Enterprise Partnership (LEP) for Derby, Derbyshire, Nottingham and Nottinghamshire
[2] Subsequently the Department for Levelling Up, Housing and Communities (DLUHC)
[3] ESIF-GN-1-033 (v4) and ESIF-GN-1-034 (v4

Overall, the project demonstrated the value and importance, to SMEs and the wider economy, of providing support which enables collaboration between the knowledge base and businesses – this is a critical component for fostering innovation, enhanced productivity and growth.

Key **strengths, challenges and lessons learnt / associated recommendations** are outlined within Section 7 of this report, in line with summative assessment guidelines.

Project context, rationale and design

The development of the DR&I project was recognisant of evidence from wide ranging data and research which highlighted the need for intervention to enhance innovation and productivity levels across D2N2 – with these historically lagging behind many other areas in the UK. As a result, the project was appropriately designed to apply knowledge and expertise from a local university (including academic, technical and business development staff) for the benefit of D2N2 SMEs. DR&I also demonstrated strategic fit with a series of relevant policies and priorities at the time of its development, at both national and regional level – whilst also being aligned to key sector strengths of the University and the D2N2 geography.

The design of DR&I was also based on clear learning from its predecessor project, Enabling Innovation. Most notably, it was designed to provide deeper and more intensive support to an increasingly targeted group of SMEs. In doing so, it sought to address the 'moderate middle band' of SMEs identified as critical to increasing growth and productivity with the region.

Project progress

Prior to the emergence in the UK of the Covid-19 pandemic, DR&I experienced a relatively rapid and successful mobilisation period at the start of 2020, with five C1/C4 outputs claimed within the first quarter. This was due to several factors including the consistency and knowledge (from previous interventions) of personnel involved, the adaptation of systems and processes that were utilised in the predecessor project, and relatively significant latent demand.

Despite this positive start, the 'gap' of approximately nine months between the end of Enabling Innovation and the commencement of DR&I was sub-optimal – and should represent learning for funders regarding the timing and announcement of future projects. It is to the University's credit that it was broadly able to maintain communication with, and in some cases actually support, SMEs during this interim period – and subsequently engage them when DR&I commenced.

The impact of the Covid-19 pandemic emerged shortly before the project's commencement in spring 2020 – leading to a complete closure of the University for c12 weeks. This had an immediate effect on the ability of DR&I to deliver its provision as originally planned, most notably the inability to engage and communicate with SMEs in person and the inability to utilise equipment and technology within each of the three centres. Positively, the project rapidly pivoted its approach via the following means:

- Communicating with SMEs (and within the project teams) via remote working methods
- Prioritising consultancy-based activity wherever possible (rather than technical support which required equipment) – this was more challenging for the PMC given its significant focus on creating a physical product or prototype for most participants
- Maintaining engagement with SMEs that required technical support to ensure they could access it when it became available again

- Focusing increasingly on one-to-one support rather than the provision of workshops (which would primarily have been delivered face-to-face if Covid had not emerged)

Further to the above impact on supply, Covid-19 perhaps had an even greater effect on the demand for the DR&I project. In particular, it had a negative effect on the demand for support from the PMC and the CIL – whereby SMEs increasingly focused on survival rather than innovation. Conversely, the FIC received ongoing and significant demand for its provision, including many SMEs within (or new to) the food and drink sector innovating directly in response to the pandemic – there were also, albeit on a smaller scale, some examples of SMEs requiring support from the CIL with regard to pandemic-related innovation.

As the restrictions associated with the pandemic eased, the University enabled the facilities within each of the three centres to re-open relatively rapidly, albeit with various conditions and restrictions initially. This enabled more technical projects to be delivered. However, demand for two of the three centres remained relatively slow, and ultimately impacted the project's ability to achieve its forecast ERDF output targets – despite various attempts to increase engagement.

Project performance

From an ERDF output perspective, DR&I is projected to fall short of its primary C1/C4 and C26 targets, achieving 73 per cent and 60 per cent respectively. This, in particular, suggests challenges in relation to supporting the *volume* of SMEs originally anticipated – although this was not an issue for the FIC which, at the end of March 2023, had contributed 53 per cent of all C1/C4 outputs and 64 per cent of C26 outputs.

More positively, the project is expected to perform relatively well against targets linked to *outcomes* (rather than outputs) achieved, whereby it will exceed its C28 target for new to market products and be within four SMEs of its C29 target for new to firm products - the PMC's focus on providing physical outcomes (i.e. products or prototypes) is evident here, with it contributing a relatively high proportion of the project's C28 and C29 outputs. Whilst project data suggests DR&I will only achieve seven of its twelve C8 employment outputs, the evaluation's feedback survey indicated a considerably greater number of jobs were enabled by the project.

Overall, therefore, the project's headline output performance was disappointing in terms of the volume of businesses supported. This contrasts significantly with the very positive feedback received from SME participants regarding the quality and impact of the support received (see below). Key factors behind the underachievement of these volume-related outputs included:

- The impact of Covid-19, in terms of reducing overall levels of demand for innovation (most specifically for the CIL and PMC)
- The impact of Covid-19, for a significant period of time, on the project's ability to deliver its originally intended *full* range of support – particularly practical-based and technical activity
- The increased focus of DR&I, partly due to the pandemic but also due to the requirements of SMEs, on providing increasingly bespoke and intensive one-to-one support

The increasingly bespoke and intensive support was evident in data provided by the project, which demonstrated that 75 per cent of all businesses achieving a C1 received *in excess* of 12-hours support, with the average amount of support being 21 hours. In total, the support for SMEs beyond 12-hours totalled an additional 1,551 hours – the equivalent of a further 129 C1 outputs.

In summary therefore, whilst the DR&I project did not meet its full range of ERDF output targets, it did provide very technical, bespoke and high quality support to businesses, the vast majority of whom received considerably more than 12 hours' support. This perhaps highlights how provision was extremely effective but not wholly aligned to the volume-based targets of the ERDF funding regime. With hindsight, given these challenges, it may have been appropriate for the project to seek a reduction in some of its output targets within its PCR (and an associated reduction in expenditure).

When reviewing project expenditure, DR&I had defrayed 93 per cent of its contracted lifetime budget by 31 March 2023. Based on the pipeline of ongoing activity and associated expenditure, it is projected that the lifetime expenditure target will be fully defrayed by 30 June 2023.

Project delivery and management

Marketing and engagement

Whilst DR&I incorporated some 'project-wide' marketing activities - for example the creation of a project flyer, press releases, a marketing video and the use of social media – its business engagement approach was essentially 'devolved' to each of the three individual centres. This approach was, overall, an appropriate decision due to factors including:

- The relatively specific and specialised focus of each centre
- Different marketing methods being more appropriate to some centres than others
- The engagement of each centre in different networks and with different partners
- Differences in the project offer of each centre

Each centre adopted slightly different engagement approaches based on their own circumstances and target businesses – as evidenced by data highlighting how SMEs first became aware of them. For example, the CIL focused increasingly on a targeted engagement approach based on research and analysis it undertook, whilst the FIC, although also undertaking some targeted engagement activity, utilised its wide ranging referral networks and partners to engage many SMEs. The PMC adopted a mixture of the above two approaches.

Whilst the project did not achieve its core C1/C4 target for the numbers of businesses supported, this was most likely due to a combination of the impact resulting from the pandemic and the very bespoke and detailed support that was provided to those businesses which were engaged – rather than any significant failure of promotion and marketing.

Project delivery

As outlined above, the delivery of the project's support (across all three centres) was bespoke and tailored to each individual SME. Key characteristics of this included the following:

- For many SMEs, an initial period of discussion, advice and planning – this was welcomed by participants, often helping to clarify their specific needs and determine the most effective way for the project to support them
- Access to significant research and analysis expertise within the three centres, both from a technical / scientific perspective and a business planning perspective
- The ability to benefit from high-spec equipment and technology, much of which was not readily available to SMEs via other means (certainly not without a cost implication)
- Provision of a single point of contact for each SME, whereby they could communicate effectively with the project – therefore supporting ongoing engagement between both parties

- Diagnostic and brokerage support with regard to linking SMEs to a wide variety of alternative knowledge and expertise as required, both within and external to the University

Overall, the primary 'USP' of the DR&I project was its ability to provide a combination of high-level expertise alongside access to unique and high-spec equipment and technology.

Participants referred very positively to the quality of support delivered by the DR&I project. The evaluation's online survey established that 90 per cent of respondents felt the provision was above standard, of which 68 per cent said it was very high quality and 22 per cent reasonably high quality (the remaining 10 per cent all stated it was standard quality). The significant majority (83%) of participants also reported that their original expectations when joining the project had either been completely met or exceeded.

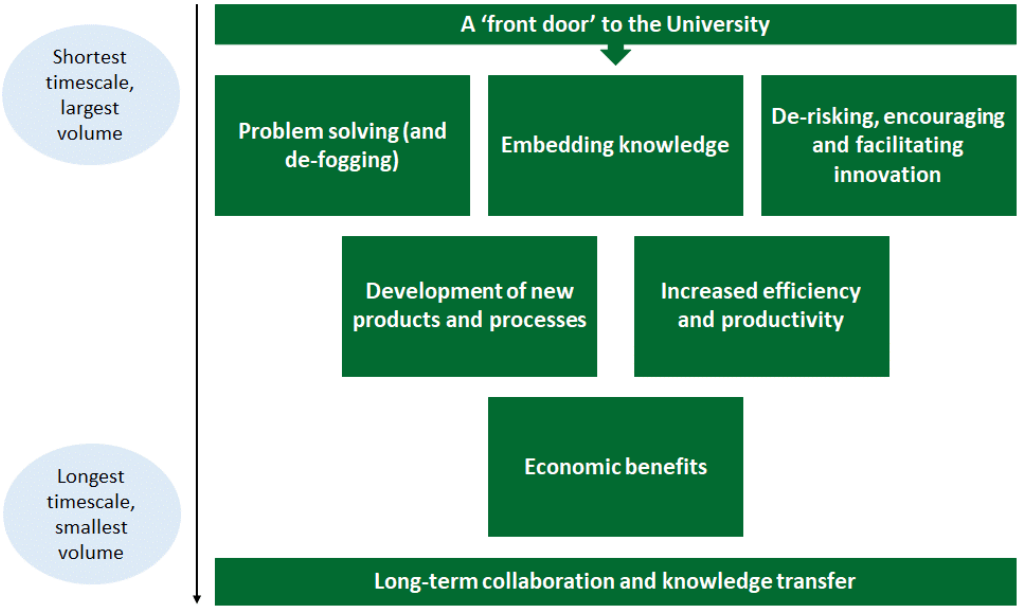
Governance and management

The project implemented an efficient and consistent governance and management function which built upon structures and processes from its predecessor. Key characteristics of this relatively light touch approach included:

- A small and defined project management group attended by representatives of each DR&I centre in addition to the overall Project Manager – quarterly meetings of the group focused on reviewing overall project progress and supporting the ERDF claims process
- A clear lead individual allocated to the project within each of the three centres – each with significant experience of delivering past ERDF projects, including DR&I's predecessor
- Within and outside of the project management group, regular and effective communication occurred between the Project Manager and the three centres – as well as across the three centres
- Unlike many time-limited projects, the DR&I project benefited from stable and consistent resourcing at management level
- The project benefited from a having a full-time dedicated manager with oversight of all three centres, which helped to remove the administrative burden from the centres themselves and therefore enabled their focus on project delivery and partnership working

Outcomes and impacts

Feedback from project participants, supported by wider consultation with stakeholders and documentary review, identified a broad range of outcomes generated by the DR&I project – with a general focus around helping smaller (and sometimes relatively new) businesses to become established and grow. The breadth of these outcomes makes them difficult to categorise, however the diagram below provides a summary of the most common benefits.



Further details of each outcome category are provided in Section 5, however the project's contribution to innovation is clearly evident within the following evaluation survey responses:

- 89% of respondent SMEs said they had a greater understanding of their innovation needs and opportunities as a result of engaging in the DR&I project
- 87% stated they had an increased capability to innovate as a result of engaging
- 93% stated they had a greater propensity to innovate as a result of engaging
- 83% stated they had already increased actual innovation activity as a result of engaging
- 56% had created a new product or process, and a further 29% were in the process of doing so – in total, this included c50 new products or processes from a sample of 41 participants

Whilst direct economic outcomes and impacts were not necessarily the focus of the project within its immediate lifetime, several such benefits were evident. Examples were provided by participants undertaking one-to-one interviews, whilst the evaluation's survey identified the following:

- 78% of SME respondents stated that their engagement with the project had enabled improvements in terms of accessing new commercial opportunities and / or supply chains, whilst 71% stated the support had enabled them to improve their turnover
- From a sample of 40 respondents, 9 (23%) SMEs had already increased their level of employment since engaging with the DR&I project, with an additional 8 (20%) in the process of doing so – across these 9 businesses, 36 individual jobs had been created
- In addition to job creation, 7 businesses (18%) stated they had safeguarded jobs since engaging with the project – incorporating 13 individual jobs (a further 10 (25%) respondents stated they had potentially safeguarded jobs)
- Across all the SMEs achieving these job-related benefits, respondents estimated a high attribution level from the DR&I project of 68%

The project provided a significant increase in engagement between SMEs and the University, with many examples of longer-term ongoing collaborative relationships occurring as a result (beyond the project itself). This has the potential to generate ongoing benefits to the SMEs, the university and the regional / national economy.

1. Introduction

1.1 This report details findings from the summative assessment of the Driving Research and Innovation (DR&I) project. The project provided direct support to Derbyshire and Nottinghamshire Small and Medium-sized Enterprises (SMEs) across the D2N2 geography[4] to improve their innovation culture and productivity.

1.2 Delivered by the University of Nottingham, DR&I utilised the knowledge, expertise and facilities of the following three centres / hubs (referenced as the 'centres' throughout this report) within the University:

- Chemistry Innovation Laboratory (CIL)
- Food Innovation Centre (FIC)
- Precision Manufacturing Centre (PMC)

1.3 The nature of the support was bespoke to each individual SME, but typically included a blend of the following:

- Initial review and diagnostic (research and innovation audits)
- Provision of consultancy support, including literature reviews and research
- Technical or analytical work (incorporating the use of equipment and technology)

1.4 Part-funded by the European Regional Development Fund (ERDF), DR&I's Managing Authority was the Ministry of Housing, Communities and Local Government (MHCLG).[5] The project officially commenced on 1 January 2020, with an original planned activity completion date of 31 December 2022. Further details of the project are provided in Section 2.

1.5 The structure of this report is designed to ensure alignment with the UK government's summative assessment guidance.[6] Following this introduction, it therefore includes the following sections:

- Section 2 provides further details of the project, include its context and rationale
- Section 3 assesses the project's progress and performance, including against its contracted expenditure and output targets
- Section 4 reviews delivery and management of the project
- Section 5 assesses the project's outcomes and impacts
- Section 6 analyses the project's value for money
- Section 7 provides conclusions and lessons learnt

[4] D2N2 is the Local Enterprise Partnership (LEP) for Derby, Derbyshire, Nottingham and Nottinghamshire
[5] Subsequently the Department for Levelling Up, Housing and Communities (DLUHC)
[6] ESIF-GN-1-033 (v4) and ESIF-GN-1-034 (v4)

1.6 The target audience for the summative assessment report includes the Department for Levelling Up, Housing and Communities (DLUHC), the University of Nottingham, wider stakeholders within the SME support arena (particularly regarding research and innovation and those within the D2N2 geography), and the national ERDF evaluator. The University of Nottingham will therefore seek to disseminate the findings of the assessment to such audiences via a range of methods, including providing copies of the report on request.

Assessment methodology

1.7 Carney Green was appointed, through a formal procurement process, to undertake an independent summative assessment of the DR&I project. This commenced in February 2023.

1.8 Figure 1.1 below provides an overview of the evaluation methodology.

Figure 1.1: Overview of assessment methodology

1.9 Further details of the research activities undertaken are detailed below.

Summary of evaluation research activities

- An initial inception meeting attended by Carney Green and the DR&I Project Manager, followed by a subsequent second inception meeting attended by wider DR&I representatives from each centre
- Wide-ranging review of project-specific documentation and data, including the original application form and each subsequent quarterly claim
- Analysis of project expenditure and output data
- Detailed interviews with the following 12 stakeholders:
  - DR&I Project Manager (University of Nottingham)
    Chemistry Innovation Laboratory
  - Professor of Practice, Science and Innovation (University of Nottingham)
  - Business Science Fellow, School of Chemistry (University of Nottingham)
  - Business Science Fellow, GSK Centre for Sustainable Chemistry (University of Nottingham)
  - Business Development Officer (University of Nottingham)
    Food Innovation Centre
  - Head of Food Innovation Centre (University of Nottingham)
  - Senior Food Innovation Advisor (University of Nottingham)
  - Food Innovation Technologist (University of Nottingham)
  - Director of Operations (The Food and Drink Forum)
    Precision Manufacturing Centre
  - Head of Business and Knowledge Exchange, Institute for Advanced Manufacturing (University of Nottingham) – *also DR&I Interim Project Manager until June 2020*
  - Senior Technical Manager, Faculty of Engineering (University of Nottingham)
  - Technologist, Faculty of Engineering (University of Nottingham)
- Detailed one-to-one interviews with a sample of 10 participant SMEs, encompassing all three centres

- Provision of an online survey made available to all SMEs that, at the time of its distribution, had achieved a C1 output from the project – this was completed by 41 respondents
- Review of case studies and / or testimonials developed by the three DR&I centres

Rationale for the methodology adopted

1.10 The above methodology was selected with regard to the following:

- Recognition of the summative assessment guidelines
- Consideration of the University of Nottingham's Invitation to Tender (ITT) for the summative assessment, together with its summative assessment plan for the project
- The practicalities of consulting different beneficiaries, particularly given that many delivery activities were completed prior to the evaluator's appointment
- Recognition of the budget available for the summative assessment

1.11 Taking the above considerations into account, a theory of change approach to evaluation was appropriate. From an attribution perspective, self-reporting was the only practical and realistic method for the evaluation to adopt, particularly given the timescale of the evaluation towards the end of the project and the impact of the pandemic upon innovation and business performance; the approach incorporated specific questions around attribution to support this, alongside consideration of ready reckoners from published material.

1.12 The approach to consulting beneficiaries was carefully considered and an online survey was developed. Specifically, this included the following method:

- A link to the online survey was sent via email by a 'known' member from each relevant centre within the DR&I project team, using text drafted by the evaluator
- The survey was sent to all beneficiaries that had achieved a C1/C4 output
- The evaluators provided regular updates of response rates, with the DR&I team subsequently sending follow-up emails

1.13 This approach provided the opportunity for feedback from a wide variety of different SMEs, including size, sector, geography and level of support accessed from the project – it also avoided the survey being 'targeted' (i.e. it was open to all).

1.14 In total, the survey received 41 responses. Alongside the detailed one-to-one interviews, this provided a sample of approximately a third of the project's C1 beneficiaries consulted within the evaluation. This was supported by reviewing additional participant feedback obtained via the project itself, specifically in the form of detailed case studies.

1.15 When consulting with participants the summative assessment ensured a focus on the following broad research areas:

- Rationale for engaging in the project
- Expectations regarding the project's support, and the extent these were met

- Views on the quality of the project's delivery
- Outcomes and impacts achieved as a result of the project's support

1.16 Questions regarding outcomes and impacts were partly focused upon assessing achievement of the project's logic model. As a result, a series of outcome indicators were developed at the start of the evaluation to reflect the logic model (as well as other potential outcomes), and were tested with each beneficiary consulted. The results are shown in Section 5.

Critique of the evaluation methodology

1.17 Reviewing the effectiveness of the research design, the following observations are noted:

- The evaluation approach enabled a detailed understanding of the project to be obtained, leading to well-informed reporting – this was supported by two inception meetings, subsequent regular progress meetings, a detailed review of wide-ranging project documentation and data, lengthy interviews with a range of stakeholders, and detailed discussions with a sample of participants.
- The evaluation process benefited from the engagement and support of a representative from each of the three centres within DR&I.
- The mixed methods approach to beneficiary consultation provided a good variety of feedback, including quantitative and qualitative responses to the online survey alongside more detailed feedback via one-to-one discussions.
- A relatively positive response rate to the online beneficiary survey was achieved – this most likely reflected the detailed and significant support provided by the project, including substantial engagement between project representatives and individual SMEs. This contrasted with evidence from other evaluations which generally indicates reduced response rates from participants across business support interventions from early 2022.
- Response rates may have been even greater if the evaluation process had occurred throughout the lifetime of the project, enabling the development of a systematic approach to capturing feedback.

2. Background and Context

2.1 This section considers the context and associated rationale within which the DR&I project was designed, and also provides further details of the intervention.

Context, demand and rationale

Learning from predecessor project

2.2 DR&I was developed as a successor to a predecessor ERDF-funded project led by the University of Nottingham, entitled **Enabling Innovation**. This project also incorporated the three centres within DR&I, namely CIL, FIC and PMC. It primarily provided relatively short duration interventions with SMEs, described within the DR&I application as a *'broad spread of thin, high level support with some deeper engagement and a chasing of volume targets'.*

2.3 Notably, the design of DR&I utilised the following learning points from Enabling Innovation, including from the findings of its external evaluation:

Learning from Enabling Innovation

- Recognition adopting a diverse range of mechanisms / support methods was successful in supporting SMEs, given the diversity of businesses engaged
- The significant benefit provided by established centres which are linked to networks of SMEs, and of utilising experienced staff
- The benefit of a proactive commercial approach to service provision, with a focus on effective support valued by the SMEs
- A requirement to provide deeper, longer and more meaningful interventions with SMEs in order to maximise impact – with more defined sector focus as a result
- The need for a clear cross-referral pathway between interventions and the D2N2 Growth Hub / other support provision – given that Enabling Innovation consisted of 27 hubs / centres across three universities, this was not as effective as it could have been

2.4 In recognition of these factors, DR&I was designed to deliver longer and more intensive support provision for each SME, incorporating multiple activities dependent on their needs. It still sought to identify common issues and solutions for a broad range of SMEs, but incorporated a greater level of deeper and more tailored support for businesses which were identified as high potential and high-revenue growth. DR&I, also in recognition of learning from Enabling Innovation, focused its activity only on three specific centres – all of which were successful within that project.

2.5 The decision to include this more detailed support was also reflective of the changing economic environment and associated priorities at the time of the DR&I project's design, for example the anticipated impact of Brexit. This was also evident within the targets for DR&I,

which included a large number of C26 outputs (enterprises cooperating with research institutions) – representing the aim of developing longer-term engagement with SMEs.

2.6 Overall, the DR&I project therefore sought to be more targeted and specific in its delivery of support. This represented a specific change in approach from Enabling Innovation, and sought to address the 'moderate middle band' of SMEs identified as critical to increasing growth and productivity with D2N2. This approach demonstrates that the DR&I project was based on detailed and specific learning from its predecessor project, Enabling Innovation. Most notably, it was designed to provide deeper, longer and more intensive support to an increasingly targeted group of SMEs.

Demand and rationale

2.7 Further to the experiences of the predecessor Enabling Innovation project, the development of DR&I also responded directly to evidence of demand. This is summarised below:

Evidence of need and demand for DR&I

- Despite there being significant employment levels within D2N2's science and technology sectors (and manufacturing within this), Office for National Statistics (ONS) data demonstrated relatively slow growth rates compared to other regions.
- Previous research had also suggested that D2N2 businesses performed relatively poorly compared to other LEP areas with regard to innovation behaviour, and more specifically, innovation outcomes – the Benchmarking Local Innovation report in 2019[7] identified the D2N2 area as being 30th out of 39 LEPs when assessing the proportion of firms undertaking product or service innovation (22.8% compared to 38.1% in the top region).[8]
- The 2019 Benchmarking report also noted that only 29.6% of D2N2 companies were collaborating for innovation, which ranked 28th out of 39 and was significantly lower than the leading LEP region (Northamptonshire, 48.3%).
- D2N2 LEP's Science and Innovation Audit (2018)[9] highlighted that the productivity performance of D2N2-based companies was significantly below national levels, also demonstrating that GVA per job within D2N2 had been consistently lower than the UK average since at least 2000 – the Audit also highlighted the poor innovation performance of D2N2 businesses as outlined above.
- The Enabling Innovation project highlighted a demand from D2N2 SMEs to engage with the knowledge base.

2.8 The evidence from wide ranging data and research therefore indicated the need for intervention to enhance innovation and productivity levels across D2N2. As a result, DR&I was designed to address this demand by applying knowledge and expertise from a local high class university (including academic, technical and business development staff) for the benefit of D2N2 SMEs. It would include a particular focus on promoting innovation to

[7] Enterprise Research Centre (2019) Benchmarking local innovation – the innovation geography of England: 2019
[8] A 2017 version of this report identified that D2N2 firms ranked in the bottom 10 LEP areas for 5 out of 10 categories of innovation performance, including 'product or service innovation' and 'new to market innovation'
[9] SQW (2018) A Science and Innovation Audit for the D2N2 Local Enterprise Partnership area

increase the productivity of the 'moderate middle band', as identified in the 'D2N2 Productivity Gap' paper presented by Richard Kneller, a University of Nottingham economist. This would be delivered via a comprehensive range of support activities specifically related to the university's expertise in chemistry, food and drink, and precision manufacturing.

2.9 The design of DR&I also considered alternative provision available to SMEs[10] in order to enable complementary provision and avoid duplication. This included reference to projects such as Aerospace Unlocking Potential (Aerospace UP) and Productivity through Innovation (PtI). The former would differ from DR&I through its very specific focus on the aerospace sector, whilst the latter was designed to deliver post graduate placements into individual SMEs to improve their productivity. Similarly, the DR&I project was designed to complement support delivered by the Food and Drink Forum, whereby the Forum would also offer support services to that sector but cover different topics at a different level.[11]

Strategic policy context

2.10 The DR&I project demonstrated strategic fit with a series of relevant policies and priorities at the time of its development. These are summarised below.

DR&I strategic policy context – summary

- The DR&I project sought alignment with **D2N2's European Structural and Investment Fund (ESIF) Strategy** by: a) enhancing access of innovation and technical expertise within the University in order to support product development and process improvements for SMEs; b) addressing limited resources and expertise available to SMEs with regard to the development of growth and business improvement strands; and c) helping to develop supply chain opportunities linked to major employers.
- The project linked directly to aim of the **ESIF Programme's Operational Call** to improve how SMEs commercialise research and collaborate with research institutions, with a focus on economic growth and job creation. This would be achieved by providing specific mechanisms for SMEs to engage with the University, and by enabling them to establish long-term collaborations. It specifically sought to address the PA1b objective to *'increase the number of SMEs engaged in knowledge exchange, collaboration and contract R&I with research institutions and help them bring new products and processes to market'.*
- The project was also designed to provide alignment with the **UK Industrial Strategy (2017)**, for example with regard to three potential competitive advantages for the Midlands Engine, namely: Advanced Manufacturing and Engineering (via the PMC and access to lean manufacturing capabilities); Digital Technologies (with the University being a partner in the Engineering and Physical Sciences Research Council (EPSRC) Digital Shoestring); and Systems Integration (through liaison with other internal departments in the University such as Energy Technologies).
- The DR&I project was shaped partly in recognition of the Industrial Strategy's **Sector Deals**, which were prominent at the time of its development. This included relevance to the Food and Drink Manufacturing

[10] Including other projects applying for ERDF monies within the same D2N2 operational call as DR&I
[11] For example, the Forum offered Hazard Analysis and Critical Control Point (HACCP) courses whilst DR&I would provide new product development advice

sector (through the work of the FIC as a central component of the project), the Manufacturing sector (regarding PMC) and chemicals and associated sectors (regarding CIL).

- **D2N2 LEP's 'Vision 2030' Strategic Economic Plan** identified eight key actions to be undertaken in order for the local region to become a high-value economy. One of these actions was innovation-led productivity growth by increasing collaboration between universities, businesses and sector bodies to develop and implement productivity and growth plans in three science and innovation core sectors (Transport Equipment Manufacturing, Food and Drink Manufacturing and Life Sciences). The focus of such support to enhance productivity included the exploitation of new technologies, the development and commercialisation of innovative products, and increased links between companies and the research base (to accelerate innovation and commercialisation).
- **The D2N2 Science and Innovation Audit** identified specific market priorities as key to unlocking productivity gains and exploiting fully the excellence of the region's local science and innovation assets. DR&I was designed to support businesses in all four of these market priorities, namely Next Generation Transport, Healthcare and Life Sciences, Future Food Processing, and Energy and Low Carbon.
- The project also provided alignment with the **West Midlands Local Industrial Strategy**,[12] regarding its focus on supporting inclusive growth and core elements of the Business Environment theme, for example the ambition to 'create new support programmes targeted at local supply chains and smaller, high potential firms'.

2.11 The role of the University's three specific centres as central components of the DR&I project was recognisant not only of the University's strengths in these sectors, but also their strategic importance to the regional economy. For example, the FIC ensures Nottingham is the leading Food Science University in the UK's primary region[13] of the **Food Manufacturing sector**, which in turn is the UK's largest manufacturing sector. With regard to the **Manufacturing sector**, this is a key sector is the East Midlands, comprising 17 per cent of regional output and supporting 297,000 jobs in 2018 (the highest region in the UK as a proportion of regional employment). The D2N2 region also hosts a growing cluster of **chemical-using businesses**, for example incorporating pharmaceuticals, metals, minerals and textiles – all of which are over-represented in terms of jobs in D2N2 compared to nationally.[14]

Driving Research and Innovation – project summary

2.12 *Please note this section summarises the project as it was originally designed. Sections 3 and 4 provide details of how it was ultimately delivered.*

Project objective and delivery methods

2.13 The DR&I project had the following single objective outlined within its logic model:

[12] West Midlands Combined Authority (2019) West Midlands Local Industrial Strategy
[13] In terms of GVA contribution
[14] The CIL has a strong track record of engaging with BioCity, one of the key local anchors of SMEs in the sector and an identified 'hotspot' in Nottingham for science and technology employment

"To increase participation and engagement in research and innovation activities by D2N2 SMEs."

2.14 To achieve this objective, the logic model stated that demand for innovation would be stimulated by the following activities delivered by each of the three centres:

- Carry out research and innovation audits for SMEs to stimulate activities
- Develop and deliver an extensive range of business engagement events including workshops, knowledge awareness sessions, showcases, consultation events etc. designed specifically to meet the needs of the D2N2 SME business community
- Provide access to speciality technology, resources and expertise through tailored business-led interventions with academic and project experts to enable SMEs to explore and benefit from new technologies, processes and knowledge
- Encourage and facilitate graduate / spin-out businesses; provide appropriate advice and assistance, enabling them to survive the 'early years'

2.15 The project also sought to facilitate links between SMEs and a series of regional partners and networks, examples including the Nottinghamshire Manufacturing Network, Defra UK Food Innovation Network, the Food and Drink Forum, the D2N2 Growth Hub, the Universities for Nottingham initiative, and MidsChem.

2.16 By achieving its primary objective, the project expected to generate a series of outcomes and impacts linked to collaborative working, innovation capability and activity, and productivity improvement. This was evident within the project's logic model, as shown below.

Figure 2.1: DR&I project logic model – outcomes and impacts

Logic Model Outcomes
• Increased awareness within D2N2 SMEs of innovation needs • Increased number of D2N2 SMEs networking for innovation • Increased innovation capability within D2N2 SMEs
Logic Model Impacts
• Increase the number of D2N2 SMEs who are actively collaborating with a research institution • Increase the number of D2N2 SMEs who are bringing new products and processes to market • An uplift in regional productivity above the current 82% of the national average

Source: DR&I Project Logic Model
Note: the outcomes and impacts did not incorporate specific baselines or targets

Eligibility criteria

2.17 The project's eligibility criteria included the following:

- Be an SME (based on the EU SME definition)
- Be located within the D2N2 geographical area (based on postcode)
- Have an identifiable innovation and / or productivity challenge
- Meet state aid guidelines

Project funding

2.18 The project's original funding package totalled £4.667m, being wholly revenue focused. This included the following breakdown by category, source and year, with ERDF monies contributing 50 per cent of funding.

Figure 2.2: Original DR&I funding by year, category and source

Category	2019	2020	2021	2022	Total
Salaries	£245,430	£1,251,295	£1,256,210	£956,219	£3,709,154
Consultancy	£10,555	£42,220	£42,220	£31,665	£126,660
Marketing	£8,050	£49,350	£54,975	£37,034	£149,409
Office Costs	£5,000	£1,500	£1,000	£0	£7,500
Other Revenue	£3,122	£31,713	£36,190	£46,799	£117,824
Flat Rate Indirect Costs	£36,815	£187,692	£188,432	£143,434	£556,373
Total	**£308,972**	**£1,563,770**	**£1,579,027**	**£1,215,151**	**£4,666,920**
University of Nottingham	£181,982	£771,266	£783,679	£596,533	£2,333,460
ERDF	£126,990	£792,504	£795,348	£618,618	£2,333,460

Source: University of Nottingham (2019)

2.19 The original funding breakdown above was developed at application stage, the point at which it was anticipated the project would commence in September 2019. In reality, and as a result of delays by the Managing Authority confirming the funding agreement and associated start date, it commenced on 1 January 2020 - hence the following revised annual funding breakdown was provided (note the totals by category and source remained the same).

Figure 2.3: DR&I funding by year – revised following amended start date

	2020	2021	2022	Total
Total project funding	£1,457,398	£1,576,770	£1,632,752	**£4,666,920**

Source: University of Nottingham (2020)

2.20 This project's ERDF funding was within **ERDF Priority Axis 1: Promoting Research and Innovation.** Specifically, this related to Investment Priority 1b: Promoting business investment in research and innovation. Priority 1b included the following two areas of focus:

- Developing links and synergies between enterprises, research and development centres and the Higher Education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation through smart specialisation
- Supporting technological and applied research, pilot lines, early product validation actions, advance manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies.

2.21 The design of DR&I was closely aligned to many of the different activities outlined above within Priority 1b.

Project outputs

2.22 The contracted ERDF output targets for the project are shown below.

Figure 2.4: DR&I lifetime output targets

Indicator	Target
C1: Enterprises receiving support	240
C4: Enterprises receiving non-financial support	240
C5: New enterprises supported	15
C8: Employment increase in supported enterprises	12
C26: Enterprises cooperating with research institutions	120
C28: Enterprises supported to introduce new to the market products	15
C29: Enterprises supported to introduce new to the firm products	30

Source: University of Nottingham (2019)

2.23 The project estimated the above targets based on the University's previous experience of delivering Enabling Innovation, and also considered what represented value for money. Internally to the project, the targets were broadly divided equally between the three centres.

2.24 The original projected achievement of the outputs by year is shown below, identifying a relatively broad spread but with a greater concentration in 2021 and 2022.

Figure 2.5: DR&I lifetime output targets – by year

Indicator	2020	2021	2022
C1: Enterprises receiving support	50	100	90
C4: Enterprises receiving non-financial support	50	100	90
C5: New enterprises supported	4	8	3
C8: Employment increase in supported enterprises	2	4	6
C26: Enterprises cooperating with research institutions	20	50	50
C28: Enterprises supported to introduce new to the market products	4	8	3
C29: Enterprises supported to introduce new to the firm products	8	16	6

Source: University of Nottingham (2019)

Governance, management and resourcing

2.25 The University of Nottingham was the project's Accountable Body and also undertook all project delivery.

2.26 The initial DR&I application outlined that the project would be overseen, both in terms of its operation and strategic direction, by a Project Management Board. The membership of this Board would include the overall DR&I Project Manager and the project managers from each of the three technical centres. The Board was designed to meet quarterly in order to review expenditure and output performance, highlight any issues or risks, and plan for the subsequent quarter. The Project Management Board would report into the University's overall governance structure (incorporating faculty Pro-Vice Chancellors, institute directors and the Head of Innovation and Research Department), including via an annual meeting.

2.27 Each of the three technical centres were then to incorporate their own management structures, including regular meetings / steering groups to oversee progress and performance.

2.28 The overall project management approach was primarily based upon the experiences of the predecessor Enabling Innovation project, with each individual technical centre taking responsibility for their finances and outputs – this recognised the significant experience (within Enabling Innovation and other projects) of key staff in each of the centres. A central Project Manager would then work closely with the lead from each centre to ensure oversight of the project and engage with the Managing Authority.

2.29 Each of the three centres incorporated a range of different resources. These varied but included roles such as a project manager (of the centre's DR&I activity), technicians, engineers, academics, research associates and administrators. A proportion of staff were allocated wholly to the project whilst others worked part-time based on the likely demand for their area of expertise.

3. Progress and Performance

3.1 This section provides a review of the project's progress over time, with a particular focus on the impact of the Covid-19 pandemic and the project's performance against contracted expenditure and output targets.

Project mobilisation

3.2 The DR&I project formally commenced on 1 January 2020, which meant a gap of c9 months between the completion of the predecessor Enabling Innovation project and the start of DR&I. The project's first quarter focused primarily (but not exclusively) on initiation and mobilisation, with notable activities during Quarter 1 2020 including:

- Project Initiation Visit (PIV) with the Managing Authority on 23 January 2020
- Development of project processes and systems, including relevant forms to be completed by participants and delivery staff
- Commencement of promotional activities, initially at the overarching project level for example via a press release and social media marketing
- Initial engagement with participants and delivery of eligible support

3.3 Prior to the challenges created by Covid-19 (see below), the project was therefore able to mobilise relatively rapidly and smoothly. Key factors enabling this are summarised below.

Factors contributing to the project's rapid mobilisation (pre-Covid-19)

- **Adapting existing systems and processes:** The project benefited from being able to utilise and adapt systems, processes and paperwork that had been in place within the previous project.
- **Experienced and consistent personnel:** Several of the key personnel within the project (including individuals from each of the three centres) had been extensively involved in previous ERDF projects, including Enabling Innovation. This, together with the ability to adapt existing systems and processes, meant the project was able to mobilise rapidly despite the official Project Manager not being appointed until summer 2020.[15]
- **Latent demand:** Given the gap of c9 months between the end of Enabling Innovation and the commencement of DR&I, there existed a pool of SMEs which required immediate support – positively, the centres had maintained engagement with many of these, ensuring they were aware of the forthcoming DR&I support.[16] In addition to these previously engaged SMEs, the University also received enquiries during the first quarter from several SMEs that had not previously engaged with the institution.

[15] Prior to June 2020 the project was managed by a representative of the Institute for Advanced Manufacturing who had been involved in delivering the Enabling Innovation project; the official Project Manager could not be recruited any earlier due to awaiting formal agreement of ERDF funding and subsequent internal recruitment procedures and processes

[16] Where possible each centre also sought to deliver ongoing support during this period, for example the PMC accessed bridging funding to enable this and also continued to provide its commercial offer

3.4 This latter point represented both a challenge and a strength relating to DR&I. Whilst it was naturally disappointing (but not unusual for externally funded projects) that there was a gap between DR&I and its predecessor, it was positive that the University maintained contact with many SMEs, made them aware of the forthcoming project, and subsequently supported them as soon as the project commenced – this rapid start to delivery within a project is relatively unusual, as was evidenced by the achievement of five C1/C4 outputs within the first quarter. This positive initial mobilisation meant that the project was able to achieve its profiled expenditure target for the first quarter, spending £250,000.

3.5 Perhaps the only notable challenge within the project's mobilisation period (prior to Covid-19) was, based on feedback from some stakeholders, the limited period of notice given to the project by the Managing Authority ahead of its commencement date on 1 January 2020. This meant that, despite the project delivering rapidly in its first quarter, it was at the same time undertaking recruitment activity. The impact of this limited notice period was mitigated by the project benefiting from the experience and associated systems / processes generated through predecessor projects.

Covid-19 pandemic

3.6 Whilst all interventions inevitably face challenges during their lifetime, the emergence of the Covid-19 pandemic in early 2020 represented exceptional circumstances. This was particularly challenging for DR&I given it emerged just as the project was mobilising and commencing delivery. The University of Nottingham, in recognition of national guidelines, was formally closed on 19 March 2020. This closure, together with the wider effect of the pandemic and its associated restrictions, presented a series of challenges for DR&I relating to both supply and demand. These are summarised below.

Initial impact of Covid-10 pandemic and associated restrictions on the DR&I project

Supply impact

- The three centres were immediately unable to deliver face-to-face provision for participants, most notably relating to:
  - Attending premises of businesses to undertake diagnostic activity and to deliver support
  - Hosting businesses at the University to discuss and deliver potential project activity
  - Utilising specialist equipment and technology within each centre – a key component of the project
  - Delivering workshop events
- Within the project teams, staff were unable to access the specialist facilities at the University or to meet with each other in person
- Recruitment within the project was delayed due to the uncertainty of the pandemic and the challenges of actually recruiting – this related to a range of different posts, including technicians and engineers. Furthermore, some project team members were furloughed

- The pandemic emerged at a point when the project (and specifically its three centres) were increasing their promotion and engagement activity, and therefore had a series of ongoing enquiries regarding the support available
- The project was unable to promote its provision as planned – partly due to the changing nature of the offer available but also the inability to attend or facilitate any face-to-face promotional events or workshops

Demand impact

- Many businesses, faced with significant uncertainty and the inability (in many cases) to undertake everyday activities, became increasingly focused on survival – therefore, even where they could access support from the project they were less inclined to prioritise innovation activity

  "The effect [of Covid-19] on the demand for the project was massive. The businesses had bigger fish to fry, they were trying to survive. The lack of demand cannot be overstated, it left us with a big issue." [PMC representative]

- However, there were some exceptions to this general reduction in demand for innovation, most notably within the food and drink sector relating to the following:
  - Existing businesses in the sector pivoting their offer to meet the changing demand resulting from lockdown restrictions – this included an increase in utilising local markets and suppliers (recognising a shift in consumer demand to buy local)
  - New businesses emerging in the sector and requiring support around the commencement / development of their business – this included individuals undertaking a career change

  "There was plenty of demand for support from the Food Innovation Centre, including lots of people starting a food and drink business who had lost their job or been furloughed. So the profile of our customers changed a bit, we had more start-ups than normal. There was also a big push for support from brewers." [FIC representative]

- **Kitchen Prep UK** represented an example of an SME which sought support having identified a gap in the market linked to the pandemic. It worked with the FIC to develop a new product line which provided keyworkers with access to a range of nutritionally balanced meals, designed to be heated in a microwave – this was supported by the creation of bespoke freezer vending machine to allow keyworkers 24 hour access to the meals
- Therefore, whilst the food services sector was very badly affected by the pandemic, the industry overall demonstrated an ability to innovate in line with shifting demand – this led to varied support requirements such as increasing online offers, home delivery provision, new product development and associated packaging support
- Although to a lesser extent, there were also examples within the other two centres of businesses innovating in response to the pandemic – for example, businesses required support from the CIL in relation to disinfectants and antiseptic wipes

  "Some businesses with a production facility were keen to produce items related to the pandemic, for example innovative disinfectants to treat large spaces and enable venues to reopen. People with ideas asked us if we could help make them, whether they would be effective, and whether they would be safe. Due to the pandemic, we prioritised these projects." [CIL representative]

3.7 Therefore, the initial headline impact of the pandemic on the project was the inability to supply provision as originally intended, and a reduction in demand for the project's support – although the demand-side impact affected PMC and CIL to a greater extent than FIC.

3.8 At an overall project level, the effects of the pandemic had an immediate impact on DR&I's ability to meet its expenditure targets. The project's Quarter 2 2020 ERDF claim stated:

"We have been hindered in our methods to support and deliver activities on the project by the University shutdown and furloughing of project team members, which have resulted in a project underspend this quarter. We were forecast to spend £390,034 in total on the project and in fact we spent £256,703 which is a deficit of £133,331."

3.9 The DR&I project reacted positively to the pandemic-related challenges outlined above. Central to this was a relatively rapid re-focusing of delivery towards online provision / remote working, and aligned to this, increasing promotion of consultancy-based support rather than technical support (which would require use of the specialist equipment that was unavailable due to the University being closed). This is summarised for each centre below.

Adapting to the challenges created by Covid-19

Chemistry Innovation Laboratory

- The Laboratory had already delivered support to several SMEs prior to the pandemic, and was in discussions with others regarding their specific support requirements and subsequent project activity.
- The CIL was able to continue projects, or elements of projects, that were literature or consultancy-based – hence such project types were prioritised from a business development perspective (compared to projects which were more likely to require laboratory-based support). Feedback indicated that this prioritisation led to an increase in the breadth of businesses supported, with a greater proportion of chemistry-using businesses rather than core chemistry businesses.
- The literature-based work was varied and wide-ranging, for example incorporating analysis of current market trends, competitor analysis and the latest research. It also supported activity specific to the pandemic, for example regarding disinfectants and antiseptic wipes.
- Some SMEs required specific laboratory-based support, hence the situation was communicated to these and it was explained they would benefit from access to the laboratory when restrictions were lifted. In the meantime, these businesses were supported with any relevant literature-based work and communication was maintained.
- The CIL also used this initial period of the pandemic to undertake more focused business development activity, including identification of specific SMEs to promote the project to (see Section 4), as well as preparation for projects which would required laboratory-based support when it reopened.

Food Innovation Centre

- Prior to the pandemic, including within predecessor projects, the FIC would commence most support by holding a face-to-face meeting with each SME at the business' premises – this often helped to identify challenges and opportunities, as well as understanding the business in more detail. This approach was not possible following the implementation of Covid-19 restrictions. Similarly, it was no longer possible for the Centre to utilise its specialist equipment to support SMEs.
- To overcome these immediate challenges, the Centre utilised technology wherever possible. This not only included communicating via virtual means, but in some cases included undertaking virtual tours of SMEs' premises. The adoption of relevant technology meant there was relatively limited impact from the pandemic on the work of the FIC on behalf of SMEs. However, there was naturally an increase in the proportion of desk-based work and literature research.

- The inability to utilise the Centre's equipment did limit some activity, meaning several SMEs had to wait until the laboratory reopened – this was the main negative impact of the pandemic on the FIC. However, in some cases members of the FIC actually carried out testing or experimental work within their own domestic premises – this was possible for more basic activities.

  "I bought a lab scale for my kitchen so that I could carry out some home-based work for SMEs, with some sending me samples to my house. This actually led to ongoing innovation, for example we had one client who wanted me to design a pasteurisation process for their product. We would normally go into the lab and use the water bath and other equipment for this work, but instead I told them to buy relevant catering equipment [similar to a water bath] and described what to do. They did this in their own kitchen, and ultimately designed their own small scale process which increased their understanding. As a result, we have since started to explain processes that can be done at home if businesses cannot yet afford their own equipment." [FIC representative]
- As detailed in Section 4, the pandemic also meant a series of expected (face-to-face) workshops did not take place; these would have been held to generate initial interest and engagement in the project.

Precision Manufacturing Centre

- The PMC was perhaps affected more by the pandemic's restrictions than the other two centres. This was primarily due to the greater proportion of project activity that required use of the specialist equipment within the Centre. Compared to the other two centres, there were very few SMEs and associated projects that could benefit solely from desk-based work – the focus was primarily on creating or improving a product or process, incorporating a 'physical' outcome.
- There were, however, a small number of SMEs that were supported offline in the early stages of the pandemic. These typically incorporated design-focused provision.
- The Centre had sought to deliver a series of face-to-face workshops within the project, particularly around key manufacturing themes (e.g. Lean), but this was not possible as a result of the pandemic. It did explore delivering online events in 2020 but there was no appetite among businesses for this due to innovation being less of a priority (note some webinars were subsequently provided later in the project, see Section 4).

3.10 Positively, as restrictions began to ease in the second half of 2020, the project benefited from its associated facilities being opened relatively early compared to other elements of the University. This was partly due to the recognition of the need to deliver a time-bound externally funded project, and also the role of the facilities in supporting responses to the pandemic (e.g. the CIL was supporting the development of disinfectants).

3.11 The re-opening of each centre's facilities meant that, under relatively strict restrictions initially, staff members were able to utilise the equipment to undertake work on behalf of participant SMEs – and increasingly technical projects could be delivered. As restrictions continued to ease into 2021 and beyond, each centre was able to meet participants face-to-face where relevant. However, some ongoing restrictions and subsequent lockdowns (e.g. early 2021) continued to affect the supply of, and demand for, the project – with some

projects not progressing as rapidly as they would have done under normal (pre-pandemic) circumstances.[17]

3.12 As lockdown restrictions ultimately eased more significantly and permanently in 2022, the project returned to relatively standard ways of working – although where relevant and appropriate some online activity continued for efficiency purposes. Similarly, demand from SMEs for innovation support started to increase again – although feedback indicated this was a slow process with SMEs still affected by the pandemic and other factors (see below).

3.13 Ultimately, the pandemic did have a significant impact on the project, particularly the level of demand for support from the CIL and the PMC – this, and to a lesser extent the limited ability to supply provision as intended, created specific challenges regarding the achievement of ERDF outputs. This was immediately evident in Quarter 2 2020 where the project, despite continuing to deliver C1/C4 outputs, began to fall behind its profiled targets, a trend which continued (further details are provided in the output performance section below).

Additional external factors

3.14 Further to the Covid-19 pandemic, the UK experienced a series of other events and circumstances during the DR&I project's lifetime. These included Brexit, increasing energy costs (linked to the war in Ukraine) and inflationary pressures / rising cost of living.

3.15 These factors did not explicitly affect the ability of the project to deliver its support but, to a relatively minimal extent, they did impact the type of demand for provision. Some project stakeholders, for example, stated that Brexit had partly limited the appetite of some SMEs to innovate by creating alternative challenges for businesses such as length supply chains and delays for raw materials (and / or increasing costs associated with these). Since exiting the EU, the CIL recognised increasing demand for support to meet revised regulations associated with the UK (rather than EU).[18] Increasing energy prices impacted many SMEs, with the project supporting some businesses to identify alternative energy solutions or processes in order to reduce costs – this was referenced by both the FIC and the CIL. For some SMEs this included an increased focus on accessing local supply chains and customers.

[17] Feedback also highlighted some challenges accessing relevant materials due to the pandemic
[18] Feedback directly from a participant SME highlighted a specific example of how the Laboratory had helped to overcome this

Project Change Request (PCR)

3.16 The pandemic's impact on the project's ability to defray expenditure and achieve outputs against original profiles led to recognition of the need for a formal Project Change Request (PCR) to be submitted to the Managing Authority. This was ultimately submitted in February 2022 and subsequently accepted by the Managing Authority. In addition to reprofiling the chronology of output and expenditure profiles, it also extended the timeframe of the project by six months to 30 June 2023. The overall expenditure and output totals did not change.

DR&I Project Change Request (PCR)

- Submitted 8 February 2023
- Six month (zero cost) project extension in recognition of the delays in expenditure defrayal and output achievement due to Covid-19 – hence the delivery completion date would be 30 June 2023
- No changes to the original *total* expenditure of output targets
- Some changes to the categorisation of expenditure to reflect the changing delivery approach of the project created by the pandemic, including:
  - 59% decrease in 'other revenue' related to a reduction in the use of venues for workshops / events and associated travel
  - 14% decrease in 'office costs' due to reductions in time spent in physical offices
  - 15% increase in 'consultancy' linked to addition expertise utilised to support in-depth technical assistance provided to beneficiaries
  - 1% increase in 'salaries', again linked to additional direct one-to-one support
- Chronological reprofiling of expenditure across the new timescale of the project to reflect expenditure to date – e.g. £650k profiled into 2023
- Chronological reprofiling of outputs across the new timescale of the project to reflect outputs achieved to date – e.g. 42 C1/C4 outputs profiled into 2023

Performance against contracted output targets

3.17 The table below shows the performance of the DR&I project against its contracted lifetime output targets at 31 March 2023, as well as its projected performance at the end of its lifetime (30 June 2023). The projected figures are based on detailed pipeline data held by the project, which is provided by each of the three centres linked to ongoing delivery of support to engaged SMEs.

3.18 The table above demonstrates that, from a *participation* or volume *perspective*, the DR&I project will fall short of its primary C1/C4 target and C26 targets, achieving 73 per cent and 60 per cent of these respectively. In contrast, the project is expected to perform relatively positively against targets linked to *outcomes (rather than outputs)* achieved from delivery, whereby it will exceed its C28 target for new to market products and be within four SMEs of its C29 targets for new to firm products. Whilst project data suggests DR&I will only achieve

seven of its twelve employment outputs, the evaluation's feedback survey indicates a greater number of jobs have ultimately been enabled by the project (see Section 5).

Figure 3.1: Performance against contracted output targets

Indicator	Original project lifetime target	Achieved at 31/03/2023	Projected final achieved (30/06/2023)	% of original target achieved
C1: Enterprises receiving support	240	160	175	73%
C4: Enterprises receiving non-financial support	240	160	175	73%
C5: New enterprises supported	15	13	15	100%
C8: Employment increase in supported enterprises	12	5	7	58%
C26: Enterprises cooperating with research institutions	120	66	72	60%
C28: Enterprises supported to introduce new to the market products	15	13	16	107%
C29: Enterprises supported to introduce new to the firm products	30	23	26	87%

Source: University of Nottingham (April 2023)

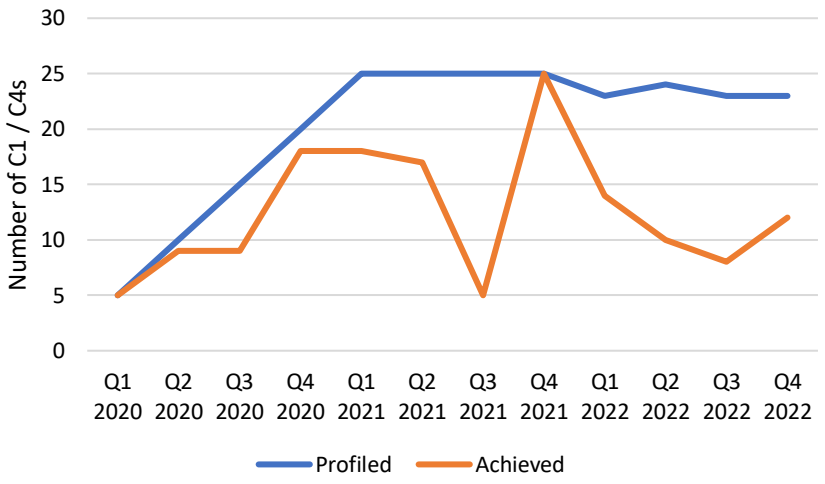
3.19 Overall, therefore, the project's headline output performance is disappointing in terms of the volume of businesses supported. This contrasts sharply with the very positive feedback received from SME participants regarding the quality and impact of the support received (see Section 5). Based on documentary review and consultation, key factors behind the project's performance against its output targets are summarised below.

Key contributing factors towards DR&I output performance

- The impact of Covid-19, and to a far lesser extent other external factors such as Brexit and energy price rises, in terms of reducing overall levels of demand for innovation, most specifically for CIL and PMC
- The impact of Covid-19, for a significant period of time, on the project's ability to deliver its originally intended full range of support – in particular this reduced the potential for direct practical-based provision (i.e. utilising specialist equipment) and for delivering workshops
- The inability to deliver practical-based activity for periods of time partly limited the ability (during that period) to deliver new product-related outputs (C28 and C29) – although data shows the project still performed positively regarding C28 and C29 targets
- The increased focus of DR&I, partly due to the pandemic but also due to initial experiences of engaging with SMEs, of providing increasingly bespoke support to each SME – hence intensive support was delivered on a primarily one-to-one basis (which is less aligned to achieving *volume* output targets)
- Aligned to the previous point, data provided by the project demonstrated that many businesses received a significant volume of support, well in excess of 12 hours – this is summarised below
- Furthermore, in reality those achieving C26 outputs represented two separate C1 outputs but are only identified as single C1 outputs within the final data

3.20 The chart below shows how the project did continue to perform relatively well against its original profiled C1/C4 targets during 2020, despite the pandemic. However, the throughput of businesses, in volume terms, was not sufficient to meet the higher profile of outputs forecast throughout 2021 and 2022 – with the exception of Quarter 4 2021 (which may have partly reflected the dip in Quarter 3 2021).

Figure 3.2: Number of C1/C4 outputs per quarter against profiled targets



Source: Adapted from DR&I quarterly claim data
Note: based on original annual profiled targets until Q1 2022, then post-PCR targets

3.21 With hindsight, given these challenges it may have been appropriate for the project to have sought a reduction in some of its output targets (and expenditure) within its PCR.

Added value

3.22 Data provided by the University of Nottingham in April 2023 demonstrated that a large proportion of DR&I participants received a significant level of support, as summarised below.

Depth of support for DR&I participants (based on data at 25 April 2023)

- 167 businesses supported, of which 162 received at least 12 hours support
- Of these 162 businesses, 122 (75%) received in excess of 12 hours support
- Across these 122 businesses, the total excess hours (above the standard 12 hours) was 1,551
- This effectively represents an additional 129 C1 outputs provided by the project
- The average amount of hours support received across all 167 businesses was 21

3.23 In summary therefore, whilst the project did not meet its full range of ERDF output targets, it did provide very technical, bespoke and high quality support to SMEs, the majority of whom received considerably more than 12 hours' support. This perhaps highlights how provision

was extremely effective but not wholly aligned to the volume-based targets of the ERDF funding regime.

Outputs achieved by each centre

3.24 As indicated above, the CIL and PMC were more adversely affected by reduced demand as a result of the pandemic. In contrast, discussions with representatives of the FIC identified relatively significant demand within the food and drink sector for innovation-related support, some of which was directly in response to the pandemic. The FIC was also well placed to benefit from its very significant referral mechanisms, and therefore potentially the greater awareness of it as a standalone centre to support SMEs – compared to the CIL and PMC.

3.25 This differing demand across the three centres is evident from the table below, which shows output contributions by centre. The table demonstrates that, at the end of March 2023, the FIC had contributed 53 per cent of all C1/C4 outputs, 77 per cent of C5 outputs, all but one of the project's five C8 outputs, and 64 per cent of the C26 outputs – the latter indicating that the FIC enabled half of its C1/C4 outputs to become longer-term collaborations. From a product development perspective, the PMC's focus on providing physical outcomes (i.e. products or prototypes) within its provision is evident in terms of its high contribution to C28 and C29 outputs.

Figure 3.3: Outputs achieved at 31 March 2023 by centre

Indicator	Chemistry Innovation Laboratory	Food Innovation Centre	Precision Manufacturing Centre
C1: Enterprises receiving support	45	85	30
C4: Enterprises receiving non-financial support	45	85	30
C5: New enterprises supported	3	10	0
C8: Employment increase in supported enterprises	1	4	0
C26: Enterprises cooperating with research institutions	13	42	11
C28: Enterprises supported to introduce new to the market products	0	4	9
C29: Enterprises supported to introduce new to the firm products	1	10	12

Source: University of Nottingham (April 2023)

Performance against contracted expenditure targets

3.26 When reviewing the project's expenditure, it is evident that it had defrayed 93 per cent of its contracted lifetime budget by 31 March 2023. Based on the pipeline of ongoing activity and associated expenditure, it is projected that DR&I will fully defray its expenditure target by 30 June 2023 – this is shown in Figure 3.4 below.

3.27 Whilst the project's PCR incorporated some changes to the forecast expenditure in terms of split by category, the final expenditure breakdown will still incorporate some variances in terms of less funding defrayed towards marketing and other revenue and more towards salaries. This is mainly reflective of a reduction in the need venues and travel associated with events or workshops, and the devolved nature of the marketing activity.

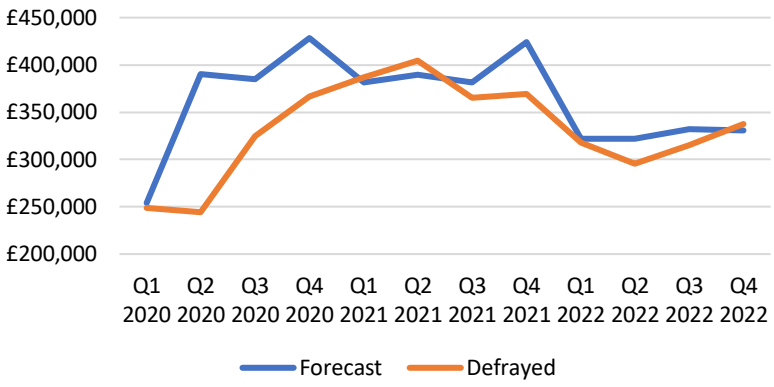
Figure 3.4: Project expenditure against original lifetime target

Category	Lifetime expenditure target	PCR expenditure target	Defrayed expenditure 31/03/2023	Projected final expenditure 30/06/2023	% of PCR target achieved
Salaries	£3,709,154	£3,743,983	£3,537,687	£3,813,050	102%
Consultancy	£126,660	£166,906	£141,497	£168,792	101%
Marketing	£149,409	£146,639	£82,114	£83,392	56%
Office Costs	£7,500	£6,429	£6,429	£6,429	100%
Other Revenue	£117,824	£41,367	£22,296	£23,300	56%
Flat Rate Indirect Costs	£556,373	£561,596	£530,653	£571,957	102%
Total	**£4,666,920**	**£4,666,920**	**£4,320,676**	**£4,666,920**	**100%**
ERDF total	£2,333,460	£2,333,460	£2,160,338	£2,333,460	**100%**
Match funding total	£2,333,460	£2,333,460	£2,160,338	£2,333,460	**100%**

Source: University of Nottingham (April 2023)

3.28 The chart below demonstrates the project's defrayed versus profiled expenditure by quarter during its first three years until the end of 2022. This shows the early impact of the pandemic whereby the project underspent significantly Quarters 2, 3 and 3 of 2020 (linked to the inability to deliver the project in full due to the University being in lockdown, as well as staff being furloughed and recruitment delayed), before recovering through much of 2021 until further restrictions occurred at the end of that year. A revised profile came into effect at the start of 2022 following the PCR – the underspend in Quarter 2 2022 was, based on project documentation, due to staff departures.

Figure 3.5: Defrayed expenditure against profiled expenditure by quarter



Source: Adapted from DR&I quarterly claim data
Note: based on original annual profiled targets until Q1 2022, then post-PCR targets

4. Delivery and Management

4.1 Section 4 provides further qualitative analysis of the project's implementation, specifically around its delivery and management.

Marketing and Business engagement

4.2 The original funding application for the DR&I project stated that it would be publicised in a variety of different ways, including the University's website, via social media, at events and through the distribution of printed materials – it would also use contacts from the predecessor Enabling Innovation project and the University's networks to promote DR&I. Furthermore, £149k within the project's original budget was allocated to marketing, with the application indicating this would be used towards the cost of workshops, venue hire, catering, the procurement of specialist presenters and the production of marketing materials (including brochures, flyers and leaflets).

4.3 Documentation, supported by consultation, identified that some 'project-wide' marketing activities took place during DR&I's lifetime – examples being the creation of a project flyer, press releases and the production of a marketing video. However, the very significant majority of marketing activity for the project was essentially 'devolved' to each of the three individual centres – with each receiving its own marketing budget allocation. The approach to devolve marketing activity to each centre was, overall, an appropriate decision due to the following factors:

- The relatively specific and specialised focus for each centre (although recognising they did each cover a variety of different sectors / sub-sectors)[19]
- Different marketing methods being more appropriate to some centres than others
- The engagement of each centre in different networks and with different partners
- Differences in the project offer of each centre

4.4 As a result of these factors, a broader marketing approach based on 'Driving Research and Innovation' would not have been appropriate; this was further evidenced by the fact that many SMEs consulted during the evaluation identified the support as being from the relevant centre, not the 'DR&I project'.

4.5 A possible means by which the project could have benefited from some additional focus on the overarching DR&I project was through more direct referrals into the project centrally, for example from the D2N2 Growth Hub. However, consultation with representatives from each

[19] For example, DR&I was more focused than Enabling Innovation due to incorporating only three centres

of the three centres identified that such referrals occurred directly to each centre – this is supported by data in Figure 4.1 below, which identifies several referrals routes.

4.6 The section below summarises how each of the three centres approached marketing and engagement.

Summary of approach to marketing and engagement – by centre

Chemistry Innovation Laboratory

- Initially engaged with a pool of businesses known the Laboratory through Enabling Innovation (although this pool was relatively small given the Laboratory's fairly minimal role within that project)
- Initial plan to raise awareness of provision through specific events and attending events led by others – however, this approach was significantly affected by the pandemic, which removed the opportunity for face-to-face events[20]
- As the restrictions associated with the pandemic persisted, the Laboratory made the decision to adopt an increasingly targeted and proactive approach to marketing and engagement – this involved research and analysis to identify appropriate and contact them individually to explain the support available – this approach represented a shift from that adopted within Enabling Innovation
- The direct approach was partly due to lack of relevant networks, groups or publications specific to chemistry – but also a recognition that many 'chemistry-using businesses' that could benefit from the support would not identify themselves as being in a position to benefit from the support of a chemistry laboratory – and hence the targeted one-to-one engagement provided the opportunity to explain how the project could be of benefit to them and could flex to meet their needs
- Whilst the pandemic meant that, ultimately, the CIL was unable to achieve its originally intended *volume* of C1/C4 outputs, the effectiveness of its proactive engagement approach meant those that were engaged all received at least 12 hours highly bespoke one-to-one support based on their specific needs – it also encouraged beneficiary businesses to refer other businesses to the project
- In addition to this targeted engagement approach, the CIL did also benefit from some broader marketing activity via its website (within the overall University site), engagement with partner organisations / networks (e.g. D2N2 Growth Hub, Medilink, BioCity) and other parts of the University

Food Innovation Centre

- The FIC used a relatively broad variety of methods to promote its DR&I provision
- At the outset of the DR&I project the FIC was able to directly promote it to SMEs already known to the Centre, including accessing some that were supported through Enabling Innovation
- However, the Centre recognised the need to engage with a wider range of businesses and therefore developed its own refreshed database which it sent mailshots to – this led to a relatively targeted approach, including a focus on more specific sub-sectors within which the FIC had its own specialisms (e.g. cider making)

[20] The reduction in the ability of each centre to utilise events to promote its activities was reflected in the marketing underspend shown in Figure 3.4 above

- One key aspect of its promotional approach was the use of social media platforms (e.g. Twitter, LinkedIn and Instagram), supported by the Centre employing a PR expert to lead this work[21] – feedback indicated this social media activity led to significant enquiries and helped to raise the profile to provision (including with the local media)
- Engagement with partner organisations, intermediaries and networks to encourage referral also represented a positive promotion and engagement approach adopted by the Centre, examples being the Food and Drink Forum, environmental health officers, the D2N2 Growth Hub, the city councils and the Institute of Food Science and Technology (IFST) – within the University itself, the FIC's affiliation with the Food Sciences Team also led to referrals
- The FIC also used its website (within the University of Nottingham site) to promote its provision, particularly by developing a bank of 14 detailed case studies demonstrating benefits to SMEs
- In contrast to DR&I, Enabling Innovation had included a significant number of workshops which had helped to bring SMEs to the FIC and engage them in the project – this was not possible during much of the first two years of DR&I

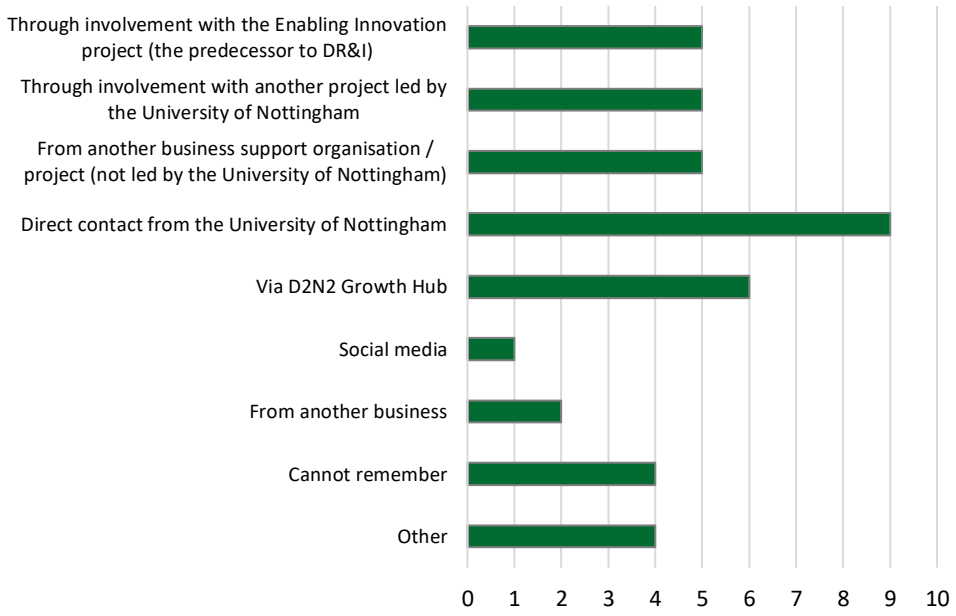
Precision Manufacturing Centre

- The PMC initially sought to engage SMEs which it was already aware of / had previous links with from past interventions – this included revisiting past activities and supporting SMEs to take subsequent steps, innovations or improvements
- The Centre did include some broader marketing and promotional activities such as a brochure, video and banners (as well as social media), but primarily focused on more targeted activity such as attending specific forums or events (the ability to do this in person was limited by the pandemic, but the Centre does Chair the Nottinghamshire Manufacturing Network and used this to promote the project)
- This targeted approach also included the Centre's positive existing relationships with large companies such as Siemens, BMW, Rolls Royce and other businesses within the aerospace sector – hence part of the approach was seeking to access the supply chains of these large companies
- Anecdotally, the Centre benefited from a significant number of business-to-business referrals and also referrals from equipment suppliers who were aware of the specialist kit within the University
- The PMC also established close links with the University's ERDF-funded Aerospace UP project, which was delivered within the same faculty – several SMEs were referred to the Centre by this project

4.7 The evaluation's participant feedback survey asked respondent SMEs how they first heard about the DR&I project (or the support they received through it). The findings are shown below, with the most common methods being direct contact from the University, followed by referral from the D2N2 Growth Hub, involvement in other projects led by the University (including Enabling Innovation), and referral from other business support projects. This further confirms the importance of existing links between the University and businesses, as well as with partner organisations, in terms of engaging SMEs. It also highlights the positive approach taken by the three centres in terms of directly identifying and engaging relevant SMEs.

[21] The Centre also worked closely with the University's Media Relations Manager

Figure 4.1: How did you first hear about the DR&I project's support?



Source: Carney Green evaluation survey (2023)

4.8 Analysis of the above by individual centres identified the following key trends:

- Direct contact from the University was by far the greatest single engagement source (42%) for the CIL, further emphasising its targeted engagement approach
- Referrals from other projects and partners were the main sources of engagement for the FIC, including the other business support organisations / partners (22% - with references made to the Food and Drink Forum and DEFRA), the Growth Hub (17%), other University of Nottingham projects (17%), and Enabling Innovation (17%) – this highlights the greater profile of the FIC among partner organisations within the business support ecosystem
- The most common engagement sources for the PMC highlighted a mixture of the above two approaches, with these being referral from the Growth Hub (30%) and direct contact from the University (30%)

4.9 Whilst the project's inability to achieve its original C1/C4 output targets does highlight some challenges with regard to the approach to promotion and marketing, the key contributing factor to this was the Covid-19 pandemic. It is also evident that the FIC overachieved against its targets, partly related to increasing demand for innovation activity within the food and drink sector. As demonstrated by feedback from SMEs later within Section 5, the quality of support and associated impact for participant businesses was very high – indicating that those SMEs targeted and engaged to the project were appropriate for the support available.

Project participants

4.10 Data provided by the University of Nottingham in April 2023 showed that 167 businesses had been supported at that point in time, of which 162 had received at least 12 hours' of support. Data availability regarding the characteristics of this cohort was limited, but the following breakdown by employee number (at the time each SME registered to DR&I) was evident for the 162 businesses.

Figure 4.2: Breakdown of participants by employee numbers

Employee numbers	Number of participant SMEs	%
0	33	20%
1-10	101	62%
11-25	10	6%
26-50	10	6%
Over 50	8	5%
Total	**162**	**100%**

Source: Adapted from data provided by the University of Nottingham (April 2023)
Note: the 1-10 cohort includes a small number of businesses with only a part-time employee

4.11 The table shows that the majority of participants had between 1-10 employees when they joined the project, whilst a relatively significant proportion had zero employees. This high concentration of smaller SMEs corresponds with feedback from project stakeholders below.

4.12 Further to the above data, feedback from across the centres suggested a relatively broad variety of business types were engaged, with the following being notable:

Participant characteristics

- The CIL noted a relatively significant number of sole traders requiring support during the height of the Covid-19 pandemic, but overall stated that the majority of businesses engaged were growing businesses with between 10-50 employees. This primarily reflected the breakdown of the sectors but is also likely have been linked to its targeted recruitment approach, which helped engage 'middle band' SMEs.
- The breakdown of the sector (whereby many businesses which grow beyond 50 employees do so very rapidly or are acquired by larger businesses) meant that few SMEs towards the larger end of the SME definition were engaged by the CIL.
- Feedback indicated that the CIL supported businesses from a relatively wide range of sectors, therefore addressing its aim of engaging 'chemistry-using businesses' as well as core chemical businesses – examples given included those focused on paints and coatings, as well as metal-orientated businesses.
- The CIL noted a low number of newer (C5) businesses engaged with the project, possibly due to the impact of the pandemic (and other subsequent external factors) stifling business creation in the sector.
- The FIC referenced a relatively broad range of businesses in terms of size, including considerable demand from start-up businesses switching to the sector (or already within the sector but creating their own business / product) during the pandemic. This partly reflected the ongoing demand for food and drink during a time when other sectors experienced falling demand, as well as an increasing focus from some people on creating new locally-based careers or careers related to a passion of theirs. This represented a contrast to Enabling Innovation, which had a greater proportion of established SMEs.

- Similarly to the CIL, the FIC referred to longstanding challenges engaging businesses at the larger end of the SME scale – with such businesses more typically focused on production rather than innovation.
- The FIC sought to support businesses from different parts of the sector. One area of significant demand was brewers, which partly reflected the specialism of an Assistant Professor within the School of Biosciences but also represented a general growth area. Other sub-sectors popular within the project included bakers, cake makers, soft drinks makers and gin distillers.
- Feedback from the PMC stated that it supported a very broad range of businesses with regard to sector and size. In many respects this reflected the relatively sector agnostic support provided by the Centre, which could be applied to businesses from a wide range of organisations. However, it was evident during the evaluation that many small manufacturers were commonly supported by the PMC.

Business need

4.13 The specific needs of businesses within the DR&I project varied both across individual businesses and the three centres. However, the most common need related to the development of a new or improved product or process, including different steps along this process – meaning most needs related to innovation and had the ultimate aim of supporting improved productivity and / or growth. Each of the three centres satisfied these needs through a combination of specialist expertise and high quality equipment / technology.

4.14 A summary of key needs by each of the three centres is provided below.

Summary of business need – by centre

Chemistry Innovation Laboratory

- Business need for those engaged by the CIL generally fell within one of the following three categories:
  - 1) the need to access equipment / technology within the Laboratory that they could not afford to purchase themselves, or which would cost them a significant amount to access commercially – this regularly incorporated a focus on product development
  - 2) having a clear brief but being unsure how to achieve it, and hence requiring the expertise and equipment of the Laboratory – for example the need to undertake quality control on a specific substance, or the need to analyse a bi-product[22]
  - 3) less defined requirements, several of which related to enhancing the business' sustainability
- Whilst SMEs that approached the Laboratory themselves often had a clear brief, SMEs directly targeted were initially engaged in a discussion whereby Laboratory staff detailed the facilities and expertise available, and highlighted how these could be applicable to that business
- Feedback indicated that many SMEs benefited from initial advice provided by the experts within the Laboratory. Even when businesses approached the project with a relatively defined brief, this initial discussion often highlighted an alternative issue or a more effective way to overcome challenges

  "It is often about overcoming a challenge faced by the business. They might know that they have a challenge, but they sometimes don't know the key underlying cause of the issue or exactly what they want. So we initially explore their challenge and advise them how best to address the problem. In some

[22] This was a common requirement for SMEs developing disinfectants in relation to the pandemic

cases there is a different problem that emerges as the root cause of their issue. In this respect the support is unique and not just a routine or analytical service." [CIL representative]

Food Innovation Centre

- The FIC benefited from knowledge gained within previous interventions, which provided it with a good understanding of likely business need. Feedback suggested this meant the Centre was proactive regarding potential support, and in particular this incorporated a wider range of provision such as that related to business planning and energy, rather than solely food production and development
- Support was varied but the most significant business need was new product development – either supporting improvement of an existing recipe, or developing a concept into a recipe. A key area of expertise here related to the scientific and technical elements associated with new product development – a representative of a partner organisation in the sector commented:

  "Most start-ups and smaller businesses in the sector can't afford a technical manager until they are more established. Therefore, if they don't have someone on board with a food science degree their product development and food management systems may be a bit weak because they don't have the scientific or technical knowledge. This is where projects such as the Food Innovation Centre can provide really vital support." [partner organisation]
- Packaging and product labelling represented another key support requirement – factors related to this included information / promotion of the product, contamination avoidance, and shelf-life
- Environmental sustainability was another key area of business need, for example developing products and packaging which highlighted a USP related to this
- Food safety management and regulatory information represented other popular business needs, for example ensuring correct processes were in place and associated documentation protocols were met
- The FIC also provided wide-ranging literature research and data for SMEs, for example relating to market trends associated with new products – in this respect business needs were not solely technical but also included business planning elements

Precision Manufacturing Centre

- Key business needs for SMEs supported by the PMC were focused on measuring, making or designing products – even when designing this normally included producing a prototype
- The focus of most activity was therefore on creating a form of product or prototype – whilst there was almost always a physical product or prototype at the end of the support, a very small minority only required reports based on testing undertaken in the Centre
- Feedback indicated that some SMEs sought to spend significant time discussing ideas with members of the PMC team in order to understand potential new products or adaptations
- Similar to the other centres, the value provided by the PMC was related to the combination of expertise and high quality equipment / machinery it provided – this enabled bespoke support for each individual business dependent on their needs

Delivery of support

4.15 This section explores the effectiveness of the project's actual delivery.

Chemistry Innovation Laboratory

4.16 The CIL is managed through the School of Chemistry's Business Partnership Unit, which maintains a focus upon developing effective collaboration and partnership working with a wide variety of businesses spanning the pharmaceutical, chemical and related chemistry-using sectors. Delivery of the DR&I support by the CIL was designed to be extremely bespoke to the needs of each individual SME. This was in recognition of the following factors:

- The likely beneficiaries of support covered a very diverse range of businesses, incorporating different sectors due to the engagement of chemistry-using businesses rather than solely core chemistry businesses – hence no single approach was appropriate
- The very technical nature of the expertise and equipment within the Laboratory also aligned with a bespoke approach
- The Laboratory sought, via its delivery of bespoke and high quality one-to-one support, to develop meaningful and sustainable relationships with businesses

4.17 The provision delivered by the Laboratory therefore sought to avoid being 'transactional', instead focusing on the development of effective collaboration using the combination of expertise and equipment available to beneficiaries.

4.18 Despite the bespoke nature of support, a broad summary of the process of engaging and assisting SMEs is outlined below.

Outline of process for supporting SMEs – Chemistry Innovation Laboratory

- Initial diagnostic discussion to understand the nature of the SME, its challenges and requirements from the project – this included relevant members of the Laboratory providing advice and expertise.
- Completion of eligibility and enrolment forms followed by more detailed communication leading to the development of a project plan / scope of work.
- Project delivery, encompassing one or both of the following broad support types:
  - a) Research or literature review – this covered a variety of themes such as technical, market assessment, patent research etc.
  - b) Laboratory-based analytical support – such support varied but often included analytical and characterisation support, product development support, developing improved manufacturing processes or providing quality control services
- If relevant, following the initial period of support (which incorporated a minimum of 12 hours) opportunities for ongoing collaboration with, and support for, the SME were explored – regularly leading to a C26 output.
- There were many examples of ongoing engagement between the SME and the CIL, both as a C26 output within the DR&I project and beyond the project itself. These incorporated longer-term research collaborations, Knowledge Transfer Partnerships (KTPs) inclusion of the SMEs as project partners with large research bids, and the inclusion of SMEs within apprenticeship programmes.

- The DR&I project therefore not only enabled direct delivery of beneficial support to SMEs, but also fostered ongoing collaboration between the University and businesses. This led to the CIL developing a significant pool of SMEs which it continued to work with as required on a variety of different interventions. This therefore helped to develop an enhanced innovation ecosystem.

4.19 The CIL did not include any events or workshops as part of its DR&I provision. This was partly due to the Covid-19 pandemic, which removed any initial opportunities for face-to-face workshops for the purposes of raising awareness of the project and engaging SMEs. However, it also represented a conscious decision to provide increasingly bespoke and meaningful support – whilst at the same time recognising the relatively disparate nature of the businesses supported.

4.20 A key element of the support was the provision of a single key point of contact from the Laboratory for each SME (other staff were subsequently engaged as required). This was well received by beneficiary businesses, providing them with clarity regarding communication with the project. Whilst all SMEs (post-Covid restrictions) did have the opportunity to work face-to-face with the Laboratory staff, or to ask the team to visit their premises, feedback indicated the majority chose not to. As a result, much of the support was delivered by the Laboratory on behalf of the SME following detailed initial discussions. At the end of the work each SME received a report and discussions occurred regarding additional opportunities and ongoing engagement.

4.21 Support provided by the CIL also included referring SMEs to other providers, organisations and networks dependent on their needs. In some cases this occurred prior to providing 12 hours of support, whilst in others it occurred following (or during) this. Examples of referral routes included:

- Other areas of expertise **within the University**, with examples including the Nanoscale and Microscale Research Centre and the Institute for Innovation and Entrepreneurship's Ingenuity Programme
- Linking businesses to **external providers or facilities**, particularly those better placed to provide access to specific equipment or expertise
- **Connecting different businesses together**, including businesses within the DR&I project and broader businesses that the Business Partnership Unit or the wider University was engaged with – for example where one business may be well placed to supply another, or where the bi-product from one business could be a valuable material for another
- Signposting directly to **funding opportunities**, for example via Innovate UK
- Referring businesses **to the other two centres within the DR&I project** and vice versa, for example chemistry-using businesses from within the brewing sector (feedback indicated this occurred on 1-2 occasions)

4.22 Feedback from participant SMEs regarding support provided by the CIL was very positive, and is outlined within Section 5 below. Overall, the key benefit of the Laboratory's offer

related to its tailored and bespoke one-to-one provision which incorporated both the significant technical and academic expertise of a variety of staff within the School of Chemistry as well as access to very specialist and high-tech equipment. This package of support provided significant opportunities for a wide variety of businesses, the outcomes and impact from which are explored in Section 5.

Food Innovation Centre

4.23 The University of Nottingham's FIC, based within the Faculty of Science, supports SMEs with the development of new products and processes from conception to consumption. Central to this is the combination of the Centre's state-of the-art equipment and facilities alongside the widespread expertise of its staff. The Centre's website highlights this expertise:

"We can access the latest scientific knowledge and thinking around food and nutrition, including food structure and flavour, sensory science, brewing science, alternative proteins, healthy eating and sustainable production or the expertise of our colleagues in Digital Manufacturing, Energy Technologies or at the Business School."

4.24 Similarly to the CIL, support delivered by the FIC through the DR&I project was wholly tailored to each individual SME, addressing their specific challenges and opportunities. An outline of the broad approach to engaging and supporting participant SMEs is provided below.

Outline of process for supporting SMEs – Food Innovation Centre

- Initial introductory meeting with the SME, whereby the FIC introduces its expertise, facilities and purpose before establishing the specific requirements of the business. Also included gauging the level of knowledge and expertise within the SME to help ascertain the level of support required. Completion of required forms and documentation, for example regarding eligibility.
- Creation of a journey of work or written brief specific to the SME, highlighting what they would like to achieve from the support and how to realise this. This was a key step in the process to ensure both parties had the same understanding and expectations of the support to be delivered. Initial consideration was also given at this stage to the potential for additional / longer-term support (C26).
- Delivery of the support, which very broadly fell into one or both of the following means:
  - Practical-based work, for example through utilising the equipment and technology at the FIC (either delivered fully by the Centre's staff or collaboratively with a representative of the SME
  - Literature or research-based work, ranging from extensive literature reviews through to research focused on market trends or regulations
- Following completion of the support, a consultancy report was provided to each SME detailing the work that had taken place, disseminated to all relevant stakeholders. At this point, initial ERDF outputs were evidenced and signed. For relevant SMEs, additional work was subsequently undertaken (C26) focused on identified ongoing requirements (leading to further ERDF outputs).
- At the end of the engagement, the FIC sought to obtain testimonials and develop case studies where appropriate and possible. These supported the ongoing marketing of the project and helped the team to reflect on the effectiveness of its support and potential areas for improvement.

4.25 Within the predecessor Enabling Innovation project the FIC delivered a series of well-attended workshops for SMEs. These were based on specific topics that were identified as areas of need (e.g. nutritional labelling) from discussions with businesses, and were a beneficial method of engaging businesses into the project – this approach was viewed as more relevant than pre-determined / generic subjects, given the variety of businesses and sub-sectors relevant to the FIC. The Centre had planned to deliver workshops using a similar approach as part of DR&I; however, the emergence of Covid-19 and associated restrictions at the start of the project meant these were not possible,[23] and ultimately only one workshop was delivered.[24] From a volume perspective, the FIC was successful in overachieving its C1 targets, and experienced significant demand for its provision – therefore, workshops were ultimately not necessary. However, feedback from key stakeholders within the Centre suggested future interventions should consider incorporating workshops to encourage an increasingly broad range of SMEs to become aware of, and engage in, the project.

4.26 A key element of the FIC's support to businesses was providing a continual single point of contact through one of the Centre's technologists – this individual effectively acted as an account manager for the SME, building trust and providing ongoing engagement regarding project activity. SMEs and Centre representatives referred to regular communication between both parties to review progress and disseminate findings.

4.27 The single point of contact also performed a diagnostic and brokerage role for businesses where relevant, for example by referring them to alternative sources of support and expertise that could not be delivered by the FIC; in this respect the Centre was often a gateway to support for businesses, utilising its knowledge of the ecosystem. Examples of referral destinations included:

- Specialist provision **within the University**, for example the nutritional department, agriculture, animal plant science, environmental science or energy department
- Linking businesses to **other business support sources**, the most common being the Food and Drink Forum, which provides a variety of complementary specialisms in areas such as food safety and accreditation support / testing, as well as the provision of grants
- Linking SMEs to **other private sector organisations**, for example given that the FIC is not an accredited laboratory for testing it referred businesses to private laboratories for such purposes (specialist ingredients suppliers represented another referral destination)
- Stakeholders from the FIC referred to limited need for **referral with the other two centres delivering the DR&I project**, although did identify instances of discussions with the CIL in relation to chemical analysis

[23] The Centre did not feel that online workshops would have generated the same benefits as face-to-face workshops
[24] This was linked to an Erasmus project regarding healthy aging ('Innovating food for seniors') which had generated significant material relevant to participant SMEs – feedback stated it was well attended

"Collaboration is a key part of the project, whether it is within the University, external to it, or linking to other businesses or clients. Other similar food specialists such as the Food and Drink Forum have different areas of expertise, so we are very happy to introduce our clients to them. This referral works both ways and helps us to further understand the key challenges within the sector." [FIC representative]

The Food and Drink Forum – a two-way referral partner

Based in Nottingham the Food and Drink Forum provides a wide range of expertise to help support and grow businesses in the food and drink sector. Discussions with both the FIC and the Food and Drink Forum identified a positive collaborative relationship between the two organisations, with regular referrals in both directions –built upon a long history of joint working.

Key to this collaboration was the complementary expertise within the two centres. Whilst the FIC has particular specialisms focused on innovation and product development, the Food and Drink Forum's expertise includes food management / operations, food safety, the provision of training and grants for equipment (it delivers the ERDF-funded FEAST2 project). This ensures excellent coverage across the two organisations.

"If we [the Food and Drink Forum] have a client who states they need funding for equipment but is still unsure of their actual product, we would refer them to the Food Innovation Centre. It is about tapping into the right support at the right time to benefit the business. We also get referrals from the Food Innovation Centre for various aspects of our support, for example if a business needs funding for equipment. The collaboration works really well and is a good model to support the food and drink manufacturing sector, both now and in the future. Businesses that don't get this important advice at the outset of their journey are far less likely to be successful." [Food and Drink Forum representative]

Examples were provided, including by businesses themselves, of how support was coordinated to SMEs between the FIC and the Food and Drink Forum. A specific example of this was **Dodolicious**, which received business planning and technical support from the FIC and HACCP and food safety support from the Forum.

4.28 Feedback from participant SMEs regarding support provided by the FIC was overwhelmingly positive, and is outlined within Section 5 below, Similarly to the CIL, feedback referred to the benefits of the FIC's very detailed and specific support. In many cases this included taking a concept and enabling the development of a product or prototype, whilst in other cases the SME was provided with significant additional knowledge from the support received – for example relating to the science behind their product.

4.29 Beyond the initial support, many SMEs recognised the benefits of engaging with the FIC and, dependent on their needs, sought additional support which represented a C26 output. These more extensive engagements often led to other outputs such as C8s (employment creation), C28s (new products to the market) and C29s (new products to the firm).

Precision Manufacturing Centre

4.30 The University of Nottingham's PMC was established in 2003 and provides a range of world-class services to industry, ranging from the development of new product designs and manufacturing techniques to pilot production of low-volume, high-value products. The

centre was upgraded in January 2018 when it formed part of the University's new Advanced Manufacturing Building.

4.31 As with the whole of the DR&I project, support delivered to businesses by the PMC was bespoke and tailored to the needs of each SME. This reflected the specialist nature of the equipment and expertise at the Centre, and highlighted the importance of initial discussions with each business. An outline of the approach taken to supporting SMEs is provided below.

Outline of process for supporting SMEs – Precision Manufacturing Centre

- Businesses entering the project initially met the Centre's Senior Technical Manager to review both the technical feasibility of the SME's requirements and its eligibility. This was a key stage of the project, whereby the expertise within the PMC often helped to inform and shape the potential project – with many SMEs initially seeking advice and guidance.
- Following completion of appropriate forms, each individual SME project was then set up based on PRINCE2 guidelines, incorporating a product description document stating what work would take place – this document was signed by both parties.
- The work was then delivered, with the majority being completed 'offline' by one of the Centre's Technicians. The type of work varied considerably by each SME, but the following is notable:
  - The majority of the work focused on creating a product or prototype of some form
  - The core business of the Centre is focused on cutting materials and making products linked to this – however, the expertise within it is broad and hence the support was flexible dependent on need
  - Some activity included a design element, although even this normally included subsequent development of a physical prototype or product
  - A small minority of beneficiaries only required reports rather than the development or feasibility of physical products - an example of this related to methods of improving the design and manufacture of a specialist shopping trolley
  - A key focus of the provision included initial advice and guidance regarding product design and / or process improvement
- Throughout their engagement in the project, each SME was provided with a single point of contact (the Senior Technical Manager) to maintain communication

4.32 Feedback indicated the majority of SME projects took more than 12-hours to complete, given the various stages from initial discussion, design (if relevant), manufacture / testing through to subsequent amendments – with most projects being focused on a specific challenge or problem which required discussion followed by a process of trial and error. Whilst a minority of beneficiaries did have clearer specifications that could be completed in a shorter time period, PMC representatives indicated that the 12-hour timeframe presented a challenge and was a consideration for some SMEs when deciding to go ahead with their project.

"Some businesses weigh up if two days of support is worth it, given that they spend additional time on the paperwork and other elements of the project. If we could offer them more time, for example a whole week or more, it would be more valuable to many of them." [PMC representative]

4.33 Despite these restrictions, the Centre always focused on providing beneficiary SMEs with a tangible outcome from their engagement, and sought to move them on to the next step in their product development or process improvement.

4.34 Support delivered by the PMC did incorporate a series of webinars, which were provided later within the lifetime of DR&I due to the initial impact of the pandemic on demand. The focus of the webinars, which were delivered via two six-hour sessions on concurrent weeks, was around digital manufacturing. This built upon the expertise of the Centre and its associated research, and sought to introduce traditional manufacturing businesses to digital techniques.

4.35 Unlike the other two centres within the DR&I project, feedback indicated there was less focus on referral to other organisations / facilities as part of the PMC's support (although it is understood some SMEs were referred elsewhere at the very start of their engagement if they were not deemed appropriate for the support of the PMC). However, whilst the Centre could normally meet all of the SMEs' needs, there were occasions when they were linked into other facilities or departments of the University.

4.36 Feedback from participant SMEs regarding support provided by the PMC was very positive, as outlined in Section 5 below. Ultimately, the major strength of the support delivered was the unique combination of high quality engineering expertise alongside a wide range of state-of-the-art precision manufacturing equipment. Whilst the items of equipment are commercially available, such a wide range and variety are unlikely to be available in the same location elsewhere. Furthermore, the equipment within the Centre is generally high specification and is relatively unique with very few in the UK. As a result, many SMEs would not otherwise have access to the equipment, or would not be able to afford to use it commercially – particularly for the purposes of innovation or testing.

Capabilities within the Precision Manufacturing Centre

Precision manufacturing

- High Precision CNC Milling and Turning
- Electro Wire and Beam Erosion
- Rapid Prototyping
- Micro Injection Moulding

Precision metrology

- Measurement of 3D form to 0.1µm precision
- Measurement of nanometre (0.001µm) scale 3D surface roughness
- Measurement and conditioning of nano-scale surfaces

Precision machining

- Positioning accuracies of ±0.5µm
- ≤0.1µm Ra surface finish capability for many materials
- Maximum repeat accuracy in a working space of 300 x 300mm

Designing and prototyping

- Product re-design for cost-effective micro-manufacturing
- Product design and performance analysis
- Small batch product prototyping

Source: PMC website

Governance and management

4.37 The main governance function within the DR&I project was undertaken by a project management group which met on a quarterly basis, in addition to more regular informal communication. The group was attended by the individual project managers from each of the three centres, together with the overall DR&I Project Manager. This function, which was relatively light touch due to the significant experience of those involved with regard to ERDF projects, was effective in terms of ensuring general oversight of the project. Key characteristics of the governance and management function, informed by consultation and documentary review, are summarised below:

Characteristics of DR&I governance and management function

- Small and defined project management group attended by representatives of each DR&I centre in addition to the overall Project Manager
- The project benefited from a clear lead individual allocated to each of the three centres
- Centre representatives had significant experience of delivering past ERDF projects, including the predecessor Enabling Innovation intervention
- Quarterly meetings of the project management group focused on reviewing overall project progress and ensuring relevant documentation / evidence was in place to submit quarterly claims
- Within and outside of the project management group, regular and effective communication occurred between the Project Manager and the three centres – as well as across the three centres
- Compared to many time-limited projects reviewed by the evaluator, the DR&I project benefited from stable and consistent resourcing – once the Project Manager was in place in June 2020, all lead individuals within the project (including within each centre) remained in their role throughout

4.38 In terms of reporting into the wider university governance, the DR&I Project Manager engaged with an experienced Professor of Practice within the School of Chemistry who retained a helicopter view of the project (academic leads from the other two relevant schools (Food Science and Engineering) also retained oversight of the project) – this oversight role helped to maintain recognition of the project's importance, for example supporting the relatively rapid opening of the CIL as Covid-19 restrictions began to ease. Alongside this, the project also maintained engagement within the University's regional SME engagement function (Research and Innovation).

4.39 The DR&I Project Manager commenced their role in June 2020, six months after the project had started. Whilst a Project Manager would ideally be in place prior to the outset, this did not appear to affect the commencement and subsequent delivery of the project – whereby DR&I benefited from an experienced member of the PMC (who was involved in the predecessor project and helped write the DR&I application) filling the role for its first six months. Consultation with key stakeholders referred positively to the role played by the DR&I Project Manager, including effective communication skills and diligence obtaining

progress updates and required documentation. The project clearly benefited from a having a full-time dedicated manager with oversight of all three centres, which helped to remove the administrative burden from the centres themselves and therefore enabled their focus on project delivery and partnership working.

4.40 The project benefited from systems and processes utilised within its predecessor project, which were adapted as required – representatives of each centre stated that the harmonisation of the systems and processes across the project worked well. Unusually in the experience of the evaluator, and possibly assisted by the absence of any grants, there was no reference to onerous systems or burdensome administration within the evaluation's consultation.

4.41 Each of the three centres, under their specific DR&I project managers, had their own management and communication structures. Consultation with a variety of stakeholders from across the project highlighted regular (weekly or bi-weekly) project team meetings with a focus on pipeline management, support requirements / progress of individual SMEs, workload across the team, risks, and progress towards output targets. There was less clarity regarding the extent to which each centre engaged formally with additional academics / experts beyond their immediate project team (for example to obtain additional independent oversight), although it is clear that each centre utilised a range of experts as required.

Cross-cutting themes

4.42 This section reviews the project's adherence to the ESIF cross-cutting principles.

4.43 **Equality and Diversity** did not represent a core focus of the project, with no direct objectives or targets related to this. However, the following is noteworthy:

- The project was open to all eligible SMEs regardless of the gender, ethnicity or background of their owners, directors and employees.
- There were some examples of specific projects within DR&I that incorporated a degree of focus on addressing equality and diversity issues – one such example was the Nutrition Advisory Team, which is providing support for primary school children to make better food and drink choices (from an educational, nutritional and environmental perspective), incorporating specific demographic areas (including more deprived areas) and schools focused on supporting autism and social, emotional and mental health (SEMH).
- As referenced in the original DR&I application, all delivery staff were given equality and diversity training during the first three months of the project, particularly around applying the University's Equality and Diversity Plan to the project and its participants.
- Facilities and processes within the University, including the centres involved in the DR&I project, are supportive of equality and diversity – for example, the CIL has an Equality, Diversity and Inclusion (EDI) committee, includes multi-faith prayer rooms, encourages the use of therapy dogs and has adopted 'blind recruitment' for first stage assessment.

- Across the project, the DR&I delivery teams included a broad range of staff with regard to gender and ethnicity; all recruitment within the project was undertaken with full regard to the University's Equality, Diversity and Inclusion policy.
- Whilst the Covid-19 pandemic undoubtedly hindered such possibilities, future interventions could potentially enhance their equality and diversity focus by undertaking increasingly targeted marketing and engagement within specific communities or networks (including those focused on protected characteristics).

4.44 With regard to the **Sustainable Development** theme, the DR&I project provided a range of different benefits directly as a result of its activity, whilst also minimising its environmental impact. This can be summarised as follows:

- Partly due to the impact of the pandemic, but also due to the direct focus of the DR&I delivery, the project incorporated relatively minimal travel and associated environmental impacts – for example, there were no face-to-face workshops within the project and a considerable amount of activity took place remotely in terms of communication between each centre and its beneficiaries (particularly in its earlier stages). The project did not include any new buildings or capital equipment.
- The CIL and FIC both included projects focused on enhancing sustainability. Examples included projects which helped develop increasingly energy efficient processes, improved the sustainability of packaging, minimised waste, and increased the use of recyclable materials as replacements for non-recyclables. There was even an example whereby SMEs were linked together whereby the waste product of one was able to form part of the materials required by another. Whilst the PMC included less projects directly focused on sustainability, this did nevertheless form a general focus of its advice and guidance to SMEs, for example recommending refinements and processes which minimised energy usage / costs and the use of materials.
- Feedback indicated that many businesses engaged in DR&I specifically did so with the aim of improving their sustainability, for example in relation to their materials, products or processes. This became a core theme of project activity, with the CIL subsequently providing specific sustainability audits.

  "As I was looking to find the 'best' environmentally friendly takeaway containers for a new business, I had hoped for a miracle! However, after much research the over-riding conclusion was that any takeaway container was not 'good' for the environment and that we should try to dissuade it as much as possible. This alone was worth the research as it prompted less reliance on takeaway sales in our business." [DR&I beneficiary]
- The FIC incorporated two research associates within its team, both of whom were given sustainability-focused briefs. This led to the development of several guides and fact sheets for SMEs regarding sustainability principles and actions they could take based on the latest research.

5. Outcomes and Impact

5.1 This section explores the outcomes and impact of the DR&I project. It is primarily focused upon feedback obtained directly by participant businesses – through one-to-one interviews, an online survey, and case studies developed by the project itself. Where relevant, findings are broken down by the three centres.

Quality of provision and meeting participant expectations

5.2 As referenced in previous sections, participants referred very positively to the quality of support delivered by the DR&I project. This was further evident within the evaluation's online survey, which demonstrated that **90 per cent of respondents felt the provision was above standard**, of which 68 per cent said it was very high quality and 22 per cent reasonably high quality. The remaining 10 per cent all stated it was standard quality, with zero participants reporting it to be below standard quality. A wide range of comments were provided regarding the quality of support, mainly relating to the knowledge, enthusiasm and professionalism of the delivery team. A sample of comments are provided below.

Feedback from participant SMEs regarding the quality of support provided by DR&I

"Excellent technical and problem-solving capability was demonstrated by the PMC team."

"[The Food Innovation Centre team] are enthusiastic and ambitious for your business. They are committed to seeing you develop your idea to fruition and consistently evaluate progress at key points, keeping you on track to improve at pace. They are supportive, challenging and thorough - a professional team."

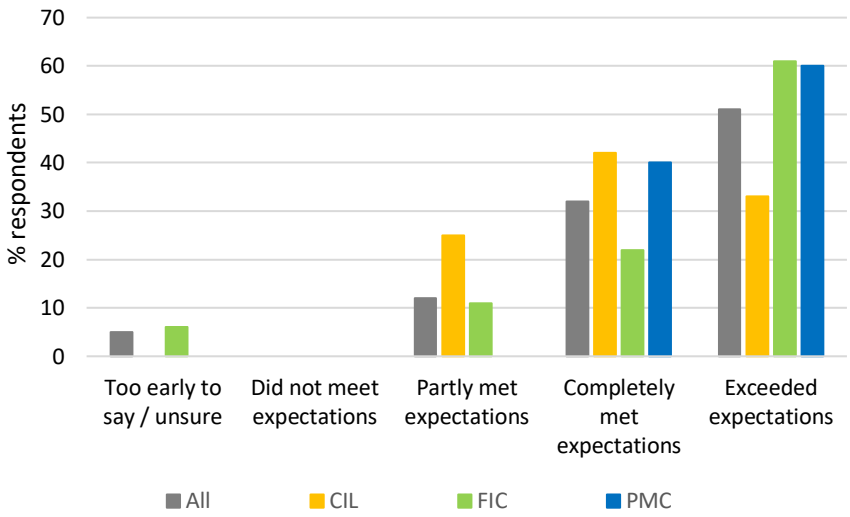
"Dr Raja has been extremely helpful throughout the process, completing the analysis in good time and providing a detailed analysis of the material."

"They have been brilliant with the support they have provided. I have been more than happy with their support. I don't think it could have been improved in any way. It's brilliant that I have been given this support for free, which has essentially helped me to launch my business."

5.3 Feedback on the quality of support was positive across all three centres, with 100 per cent of respondents stating the FIC support was above standard quality; the same figure was 90 per cent for the PMC and 85 per cent for the CIL.

5.4 **The significant majority (83%) of participants also reported that their original expectations when joining the project had either been completely met or exceeded**, as shown in the Figure below. This was again evident across all three centres, although it is noted that 100 per cent of PMC participants met or exceeded their expectations.

Figure 5.1: Extent to which participant expectations were met



Source: Carney Green evaluation survey (2023)

5.5 Comments from participant SMEs outlined a variety of reasons why their expectations had been met or exceeded. Examples of comments are provided below.

Feedback from participant SMEs in relation to their original expectations being met or exceeded

"We required a material analysis to support our submission to DEFRA for our EU REACH obligations. After supplying a small sample of the materials for analysis, we received a detailed report analysing the material, which allowed us to complete our submission to DEFRA."

"The Food Innovation Team has been an invaluable support in the growth of my functional drinks business. I came to the team with only an idea of the product that I wanted to create and a very limited understanding of the food and drink industry. Alice and team walked me through every step of the new product development process to bring a drinks product to the market with an incredible level of expertise."

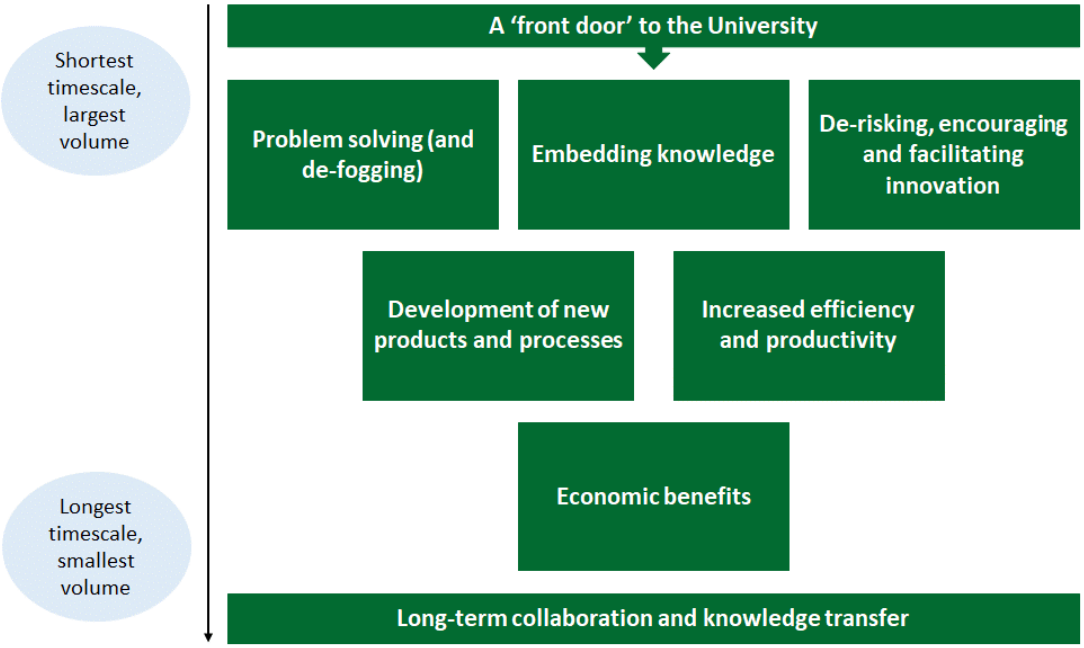
"Strong commitment from the PMC team to making a first prototype product work as intended."

5.6 The evaluation's survey asked participant SMEs to state, on a scale of 0-10, the how likely they would be to recommend the DR&I project to a friend or colleague. Of the 36 respondents, the average response was 9, with both the median and mode being 10.

Outcomes achieved

5.7 Feedback from participants, supported by wider consultation with stakeholders and documentary review, identified a broad range of outcomes generated by the DR&I project – with a general focus around helping smaller (and sometimes relatively new) businesses to become established and grow. The breadth of these outcomes makes them difficult to categorise, however the diagram below provides a summary of the most common benefits.

Figure 5.2: Broad categories of outcome generated by DR&I



5.8 Each category is discussed below.

A 'front door' to the university

5.9 An immediate benefit of the DR&I project, for both SMEs and the University itself, was the provision of an additional 'route in' to the University for businesses. This route represented more than simply engagement of SMEs in the project, as in many cases it fostered longer-term collaborations (see separate outcome below) and also enabled businesses to understand the potential benefits available to them within the University.

5.10 This 'front door' was particularly facilitated by the expertise and experience of staff within the three centres, in terms of fostering links between the University and business. For example, this represents a key focus for the Business Partnership Unit within the School of Chemistry, which incorporates Business Science Fellows with expertise related to the interface between scientific knowledge and working in industry.[25] Similarly, Technologists and Advisers within the FIC combine technical and scientific expertise with significant experience of working in business, whilst Technicians and Engineers within the PMC have longstanding experience of supporting businesses. One participant SME commented:

[25] They are typically post-doctoral level scientists that have received subsequent training around business and entrepreneurism – and have worked on many SME-focused projects

"We have gained significant benefit from a commercial point of view due to the time, effort and engagement of CIL. It isn't easy for businesses to make contact with universities, but this made it very easy." [DR&I beneficiary]

5.11 This breadth of expertise within the project provided the following benefits:

- An ability to understand the technical or scientific requirements of the SMEs whilst also being able to speak the language of business
- Working at the speed required by participant businesses, removing traditional concerns of some SMEs regarding academics and universities working at a different pace to them
- The knowledge to broker engagement (when required) between the business and specific academics or other areas of expertise within the University – helping them to navigate the institution

5.12 This latter brokerage and navigation role was a critical element of the project, with several examples whereby SMEs were referred to other areas of knowledge within the University.

"The literature review provided by the team made us aware of a technology at the University that would fulfil our R&D requirements, and we were immediately connected to the relevant academic to take the research forward. This has led to a £500k Innovate UK project." [DR&I beneficiary]

5.13 The **Nutrition Advisory Team** represented a specific example of how the DR&I project provided wide-ranging brokerage to different experts within and external to the University. This included professors, the University's Clinical Nutrition Team, public health representatives and local authority catering experts, all of which enabled the organisation to develop a series of resources which will be piloted within Nottingham primary schools in June and July 2023. Furthermore, two of the University's students are providing ongoing support to the Nutritional Advisory Team by undertaking a literature review and by evaluating the resources piloted in the primary schools.

Problem solving

5.14 The DR&I project incorporated a significant focus on solving specific problems faced by SMEs. This was common to all three centres within the project and related to issues regarding products, processes and services within the participant businesses.

5.15 An important process within this problem solving was initial advice and guidance provided by the three centres, which included 'de-fogging' specific challenges or issues. For example, feedback indicated that some SMEs knew they faced a specific challenge but were unaware of the key underlying causes of this, or were unsure of the best approach to addressing it. All three centres, for a significant proportion of participants, therefore spent an initial period of time understanding and reviewing the challenges faced – in some cases this led to a revised focus. Compared to some more commercial providers, the DR&I project enabled the three

centres to spend this additional up-front time to explore the most appropriate solution free of cost to the business, without the need to 'sell' a specific product or approach.

5.16 Following this initial review of the business' challenges, several projects delivered through DR&I helped to overcome a specific problem. For example, the CIL supported many businesses to overcome problems related to meeting regulations, safety requirements and testing the effectiveness of processes. In terms of safety, this included several newer and / or smaller businesses in relation to their operational procedures, for example artists and jewellers using specific materials – hence the Laboratory undertook testing and / or provided advice with regard to the safety of procedures as well as the disposal of materials and bi-products. Problem solving across the three centres also supported the development of new or improved products and processes, helping them to take the next step.

Boneham and Turner are precision manufacturing engineers supporting industries including Formula 1, aerospace and defence. The PMC provided the business with expertise and access to specialist spark eroding equipment in order to overcome a challenge related to manufacturing a specialist part from carbide. This ultimately enabled the business to fulfil an existing order with a key client, maintaining an important relationship. A similar project occurred whereby the PMC supported **Tyler Bros** to fulfil an order by undertaking wire eroding using a specialist Electrical Discharge Machine (EDM).

PI-KEM are specialist suppliers of advanced materials and equipment for innovative research, custom manufacturing to exact specifications and in-sourcing niche products as required by clients. The business engaged with the CIL following the need to demonstrate compliance with UK REACH regulations regarding the importation of chemical substances over one tonne. Whilst analysis of the imported substances (nickel oxide) was provided by the Chinese supplier, this was insufficient to complete the REACH application. Samples were therefore sent to the CIL which was able to utilise its expertise and equipment to undertake tests and provide in-depth analysis. This enabled PI-KEM to complete the application and achieve compliance, therefore avoiding a potential fine and ensuring the business could continue taking on increasingly larger orders – therefore removing a barrier to growth and opening up additional markets.

"To know we had got the application signed off and approved, and to be completely compliant, was brilliant and a real weight off our minds. It ensured we avoided any fines and meant we could continue to take on larger orders and grow."

The FIC supported **White's Gourmet Fried Chicken**, which provides a range of 'street food' style food, to create nutritional information so it could produce compliant labels for one of its new consumer products – enabling the product to be launched and supporting expansion of the business. This occurred through the production of a document summarising requirements for a compliant label, and signposting to relevant legislation. In addition, the FIC also provided technical ideas on how to adjust the formulation of the business' 'Bird Dust' coating product to enable an improvement in quality when oven baking (rather than frying). Various other support was also provided, included a report detailing technical considerations required when commencing the provision of chilled consumer products for direct to consumer sales.

Embedding knowledge

5.17 As referenced above, the DR&I project made wide-ranging and high-level knowledge and expertise available to SMEs. Across the three centres this included core teams delivering the majority of support, but also utilised wider and sometimes more specialist expertise as

required. This was a key strength of the project, whereby the centres were able to call upon the wider expertise within such a large and varied institution.

5.18 Having access to this expertise not only assisted the SMEs to overcome challenges, develop new products or processes and grow their businesses, but also to embed new knowledge within them – this included business-related knowledge as well as technical and science-focused expertise. The evaluation's survey found that 93 per cent of respondents had enhanced technical knowledge / capacity within their business as a result of engaging in the project (30% very significant improvement, 28% significant, 28% reasonable and 7% marginal).

5.19 **Diistil Limited**, an innovative spirits technology company, accessed wide-ranging support from the FIC in relation to its concept to launch journey. A key element of this included comprehensive trends analysis providing current and future predicted trend insights across both the alcoholic and non-alcoholic premium drinks markets (with recognition of the impact of Covid-19). Beyond this initial support, the collaboration was extended to provide product tasting evaluations, accredited technical guidance and product Beta testing support. The company subsequently evolved at pace and launched commercially in August 2022.

5.20 Knowledge development was partly enabled by the project not simply providing a transactional service, but by also delivering detailed advice and expertise. The benefit of this approach meant that new knowledge became embedded within some of the SMEs and they were subsequently able to utilise this moving forward.

"I learnt so much [from the University], and came out of the project with a lot of knowledge. Ultimately, it equipped me with a lot of knowledge and empowered me to have conversations with scale up manufacturers and a recipe developer." [DR&I beneficiary]

5.21 The DR&I project also delivered additional knowledge in the form of helping SMEs to increase their awareness of the wider support community *beyond* the University itself. This appeared to be particularly prevalent for the FIC, with several examples of businesses supported to identify and engage with specialist ingredient suppliers, equipment manufacturers, key retail channels and experts related to packaging and distribution, for example.

De-risking, encouraging and facilitating innovation

5.22 The provision of access to specialist technology and equipment via DR&I, alongside the knowledge and expertise of staff, effectively de-risked innovation – enabling SMEs to test new products, processes or ways of working without the same level of financial (and other) risk that would have otherwise been incurred. Several businesses consulted during the evaluation explained the following:

- They would not have had access to the relevant equipment / technology or expertise required to innovate without the DR&I project

- If they could have accessed the equipment elsewhere, they may not have received the same level of independent advice and expertise
- The cost of accessing the same equipment and expertise elsewhere, if available, would have been very significant in many cases – which may have prevented the project from progressing (or significantly delayed it)

"Without the support of DR&I our project would have been delayed and we'd have had to pay for a commercial lab to do some work. It would not have been ideal for us to pay given this was a new project for a small business; we would have had to find some funding. It was a major benefit to us that the facilities were available." [DR&I beneficiary]

5.23 The evaluation's feedback survey identified the significant impact of the DR&I project from an innovation perspective, as outlined below.

De-risking and facilitating innovation – participant feedback

- **89% of respondent SMEs said they had a greater understanding of their innovation needs and opportunities as a result of engaging in the DR&I project** (20% very significant improvement, 33% significant improvement, 28% reasonable improvement, 9% marginal improvement)
- **87% stated they had an increased capability to innovate as a result of engaging in the DR&I project** (20% very significant, 37% significant, 26% reasonable, 4% marginal)
- **93% stated they had a greater propensity to innovate as a result of engaging in the DR&I project** (9% very significant, 52% significant, 28% reasonable, 4% marginal)
- **83% stated they had already increased actual innovation activity as a result of engaging in the DR&I project** (20% very significant, 37% significant, 20% reasonable, 7% marginal)

5.24 A specific example of how the DR&I project enabled innovation which may not have otherwise taken place was the CIL's work with **Phenotypeca**, a business established in 2018/19. This involved extensive tests related to making spider silk protein, ultimately providing initial proof of concept and leading to significant and ongoing collaboration between the business and the University. This was particularly important to Phenotypeca in terms of supporting the business to survive the impact of Covid-19 as it maintained progress and enabled grant funding to be accessed for further research and development. At the time of writing the business now employs 20 people and the spider silk project continues to progress with the University, having been awarded funded through the Biotechnology and Biological Sciences Research Council (BBSRC) for a four-year PhD project.

"It [the DR&I project] *allowed us to test something we would not have otherwise tried. It was very high risk and hence we would not have progressed it on our own. We would have needed to put a lot of money into it, but we wouldn't have been able to raise the funding until we'd proven the concept. This is where the University is critically important for enabling innovation within new and smaller companies, providing access to equipment and expertise to get proof of concept data. Without the collaboration they would not happen." [DR&I beneficiary]*

Development of new products and processes

5.25 Support towards the development of new products and processes (and services) represented a key outcome for DR&I participants, with data from the evaluation survey demonstrating that 56 per cent of participant SMEs had created a new product or process, and a further 29 per cent were in the process of doing so – in total, this included c50 new products or processes already created from a sample of 41 participants.[26] Given that each business was only required to be given 12-hours' support, this represents a significant achievement. Across the three centres, product and process development was most significant (in proportional terms) within the PMC (70%), followed by the FIC (61%) and then the CIL (42%) – perhaps reflecting the greater role of the Laboratory with regard to problem solving and supporting specific steps *within* process and product development.

The FIC supported **Funki Drinks** by providing wide-ranging support which ultimately enabled it to develop a carbonated soft drink fortified with fibre, therefore improving gut health. The initial reason for engagement was to access technical and scientific expertise in developing the drink itself, but the FIC ultimately provided a much wider range of support to assist with the product, particularly regarding business-related knowledge – for example researching market feasibility, identifying ingredient suppliers, understanding how to scale-up the product, and identifying required regulatory information. This enabled the business to take three recipes to a recipe development consultancy and, at the time of writing, the product is ready for launch.

"The Food Innovation Team has been an invaluable support in the growth of my functional drinks business. I came to the team with only an idea of the product that I wanted to create and a very limited understanding of the food and drink industry. Alice and team walked me through every step of the new product development process to bring a drinks product to the market with an incredible level of expertise. The team helped me to test and refine my idea, better understand the market, gain an awareness of the technical and regulatory challenges associated with my product, source industry suppliers, and develop a prototype which I can gather feedback from consumers and secure further funding from investors. Without the support from Alice and team, I would have been unable to commercialise my product in 12 months, have significantly less knowledge and network within the industry, and have spent £0,000s more (which I couldn't afford) on bringing my product to the market."

5.26 The CIL supported **Green Science** through the provision of testing to ratify the company's own experiments regarding the extent to which its pellets absorbed phosphate, therefore removing it from water sources – this independent testing was critical for regulatory and legislative purposes. The Laboratory also subsequently supported Green Science to confirm that the phosphate could be recovered and used / sold for commercial purposes – and that

[26] Data collected by the project itself demonstrated the achievement of 16 C28 (new product to market) and 26 C29 (new product to firm) outcomes

the pellets could be recycled. This support led to Green Science purchasing machinery to manufacture the pellets.

A subsidiary of **Clarion Water Ltd**, Sentinel Pool provides autonomous and continuous swimming pool maintenance via a specific product (the Sentinel S3 system). Whilst developing the product, the company were referred to the PMC by the CIL in order to obtain advice regarding how to manufacture a sensor block, which represented a key component of the system.

Following an initial review, the PMC advised manufacture via CNC machining and also provided technical drawings for the sensor block (Sentinel SensorBlock™), which is machined from a single solid block of acrylic – this was critical for the successful development of the product. Recognising the expertise and associated equipment within the Centre, Clarion Water reached agreement for the University to subsequently manufacture the first 100 of these components, representing ongoing collaboration between the two parties. This is expected to continue, with the business keen to maintain engagement with the PMC.

Ultimately, the support provided through the DR&I project enabled Clarion Water to develop and launch the Sentinel system, which had already been installed in 16 pools at the time of writing and has significant demand moving forward. It is expected this will continue to generate turnover for the business and, based on forecast demand, will lead to additional job creation.

"The Precision Manufacturing Centre were fantastic, with an excellent team of engineers and kit which was beyond what I could have expected. They developed the component in two months from concept design to having the physical component available. I will continue to work with them as the business develops."

5.27 The continuation of product and process development was also supported by the project helping some SMEs to access additional funding, for example via Innovate UK – Funki Drinks being a specific example of this, whereby the work it undertook with the University was recognised in its funding approval from Innovate UK.

5.28 Section 4 above provided several examples of how the DR&I project supported **improvements to SMEs' with regarding to their levels of environmental sustainability** – primarily as part of process and product development. This was perhaps most evident within the work of the CIL and FIC, within which many businesses approached the project requesting how to enhance the sustainability of their processes and practices. Ilkeston-based **KB Packaging** represented a specific example of this, with the Laboratory assisting it to switch to more environmentally-friendly packaging materials used for home meal kits, and also by providing advice for it to pass onto its consumers regarding how to dispose of gel packs within the packaging.

Increased efficiency and productivity

5.29 Several businesses consulted during the evaluation outlined how the support from the DR&I project had enabled them to improve efficiency within their business processes, and at the same time led to greater levels of productivity. In many cases this was linked to the project

advising or supporting them to overcome specific challenges or to improve processes and products.

5.30 The evaluation's feedback survey identified that 71 per cent of respondent SMEs had improved their efficiency through engaging in the project, and 69 per cent had improved their productivity – the most common levels of improvement for both of these indicators were 'significant' and 'reasonable'.

5.31 **Jampa's**, a plant-based food company, received support from the FIC to enhance the efficiency of its processes and achieve a corresponding increase in productivity. Whilst the support was wide-ranging, a key element included a development day held in the University's Food Processing Facility, trialling the impact of specific key ingredients and processing modifications on Jampa's product. This not only led to the achievement of product texture optimisation, but also enabled a simplified manufacturing process to enable greater production efficiency.

Economic benefits

5.32 Despite the relatively limited level of support available within the confines of an ERDF project, the DR&I project assisted many participant SMEs to achieve economic benefits – both directly and indirectly. These were particularly enabled by the specialist and bespoke support provided to businesses, including the more intensive and longer-term assistance via the C26 outputs. Although feedback indicated that many economic benefits would occur over a longer timescale than the project's lifetime, the following was evident:

- 78% of SME respondents to the evaluation's survey stated that their engagement with the project had enabled improvements in terms of accessing new commercial opportunities and / or supply chains, whilst 71% stated the support had enabled them to improve their turnover
- From a sample of 40 respondents, 9 (23%) SMEs had already increased their level of employment since engaging with the DR&I project, with an additional 8 (20%) in the process of doing so – job creation was broadly similar across the three centres, although slightly higher (28%) for FIC beneficiaries
- Across these 9 businesses, 36 individual jobs had been created
- In addition to job creation, 7 businesses (18%) stated they had safeguarded jobs since engaging with the project – incorporating 13 individual jobs in total (safeguarded jobs were most common among CIL beneficiaries) – a further 10 (25%) respondents stated they had potentially safeguarded jobs
- Across all the SMEs achieving these job-related benefits, respondents estimated a high attribution level from the DR&I project of 68%

5.33 These economic benefits, all of which indicate business growth, occurred as a result of different aspects of the project's support, but most notably support around product and process development.

Long-term collaboration and knowledge transfer

5.34 Beyond the direct benefits provided by the project, there were many examples of it facilitating longer-term collaborative working between SMEs and the University. This is discussed in more detail later in this section under 'outcomes for the University of Nottingham', and related not only to the more substantial C26 outputs but also ongoing collaboration beyond and outside of the project itself – the aforementioned Phenotypeca represented a clear example of this, with several different examples of ongoing joint working taking place.

5.35 The evaluation's feedback survey established that 78 per cent of respondent SMEs had experienced improvements regarding their long-term collaboration with the University (33% very significant improvements, 26% significant, 15% reasonable, 4% marginal).

Summary of outcomes tested with SME participants

5.36 Further to the outcomes outlined above, all evaluation survey participants and those consulted via one-to-one interviews, were asked if the project's support had led to any specific improvements – based on a list of potential outcomes (partly informed by the project's logic model). The results of this are shown in Figure 5.3 below.

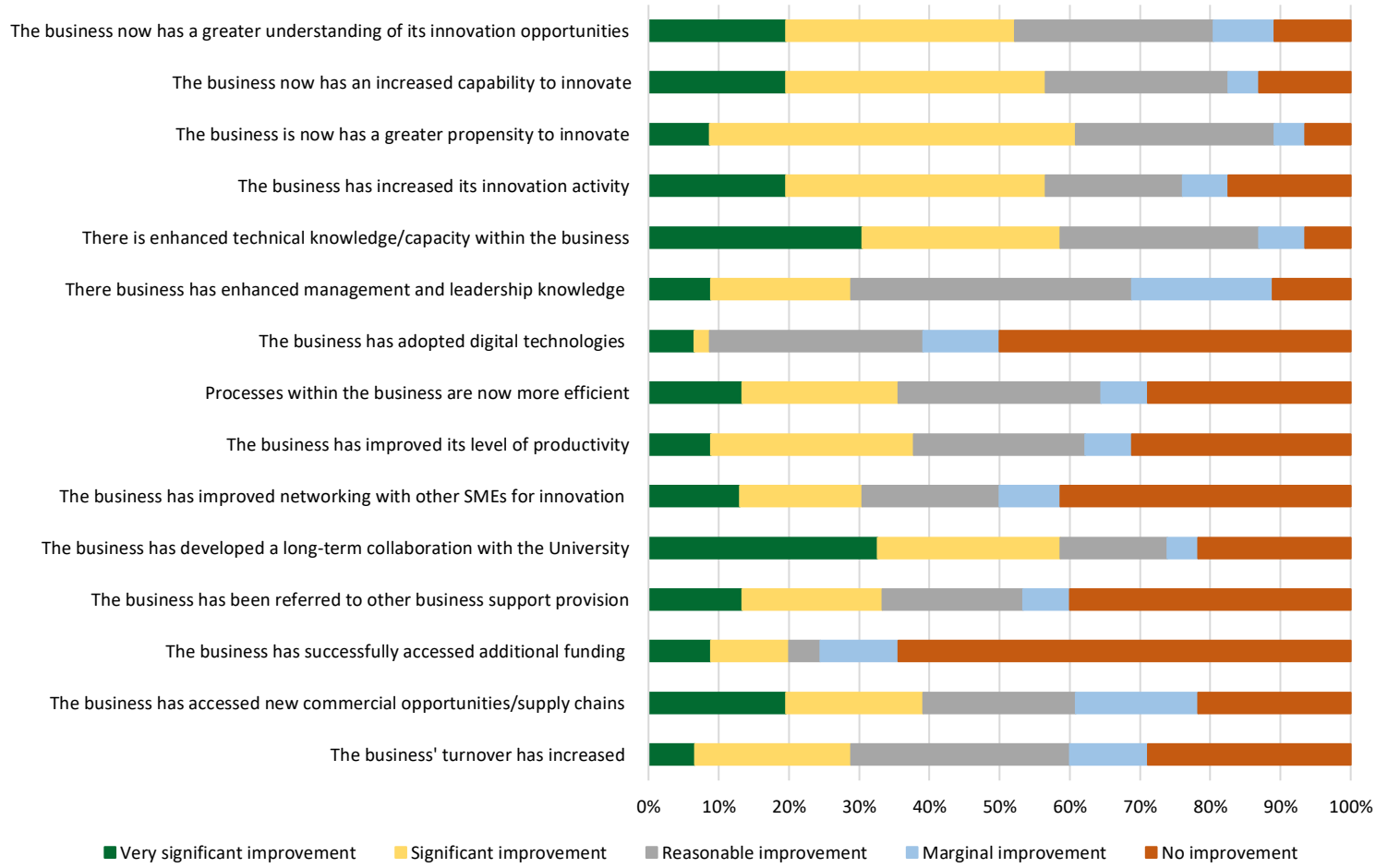
5.37 When reviewing these findings it is important to note that not all outcomes were relevant to each participant SME, for example very few joined the project with the aim of being referred to specific funding opportunities, or to network with other SMEs. In such circumstances the respondent SME would have selected 'no improvement' in the chart below. Hence the focus of the results is not specifically testing the extent to which each individual outcome was achieved, rather to highlight the most common outcomes resulting from the project.

5.38 The results demonstrate that the most commonly cited outcomes were:

- The development of long-term relationships with the University (beyond the project)
- Enhanced technical knowledge and capacity
- Enhanced innovation – in terms of understanding innovation needs and opportunities, capability to innovate, propensity to innovate and actual innovation undertaken
- Access to new commercial opportunities / supply chains
- Increased efficiency and productivity

5.39 These findings are consistent with the headline outcomes identified earlier in this section. For example, they particularly demonstrate the effectiveness of the project in stimulating longer-term sustained collaboration between SMEs and the knowledge base – this engagement represents excellent strategic added value generated by the project.

Figure 5.3: Range and extent of outcomes achieved



Source: Carney Green evaluation survey / interviews (2023)

Gross economic impact

5.40 Assessing the impact of the project in terms of its contribution to Gross Value Added (GVA) forms part of the summative assessment guidance. The most realistic and achievable way to estimate GVA impact is via the project's contribution to job creation.[27] Direct job creation, within the lifetime of the project, was not an immediate focus for the DR&I project – as evidenced by its relatively low C8 employment increase target (12). However, as a result of its bespoke support, it is likely the project will contribute directly and indirectly to longer-term economic impacts.

5.41 To estimate the DR&I's job creation, we have utilised the results of the evaluation's online survey. Although this was completed by a relatively substantial proportion of participants, and is likely to be a more accurate representation of the project's contribution to job creation than its C8 output,[28] it should nevertheless be treated with caution.

5.42 The survey identified that 9 respondents had achieved new jobs, 23 had not, and 8 were in the process of doing so. Excluding those in the process of doing so, the total jobs created at the time of the survey across these 9 SMEs was 36. When extrapolated against the full population size of the project (175 C1 outputs), it is estimated that 158 jobs would be created across the overall project. The same approach can be taken for jobs safeguarded, of which there were 13 identified within the survey. These figures enable an outline estimated calculation of the project's initial gross direct contribution to GVA within the regional economy, based on the latest available GVA per job figure for Derbyshire and Nottinghamshire.[29] Using this methodology, it is estimated that the project's **initial gross direct economic impact** is:

Estimated gross direct economic impacts (based on extrapolated survey findings)

- Created an estimated 158 gross direct jobs and generated an estimated gross direct £7.8m GVA
- Safeguarded an estimated 57 gross direct jobs and safeguarded an estimated gross direct £2.8m GVA
- Created and safeguarded a combined estimated 214 gross direct jobs, therefore generating and safeguarding a combined estimated gross direct £10.7m GVA

[27] It is probable that increased productivity (output per worker) achieved will have also generated additional GVA; however, the capture, measurement and evidencing of this is not feasible within the scope and timescales of the assessment
[28] Given the project team will not have systematically confirmed C8 outputs with all participants due to its minimal targets
[29] Office for National Statistics (July 2022) Subregional productivity

5.43 Based only on the project's contracted number of C8 jobs created (7 jobs), there will clearly be a substantially lower estimate of associated gross direct GVA generated; this figure would be £348k. This would be a significant underrepresentation of the project's impact.

Net economic impact

5.44 It is important to recognise that not all gross economic impacts can be attributed to the project; some may have occurred anyway without its support. Furthermore, it is possible that some impacts may occur outside of the D2N2 geographical area, or that the impacts achieved by a beneficiary business may displace potential impacts for a non-beneficiary business. These issues are summarised below:

- **Deadweight** represents the level of outputs which would have occurred anyway if it had not gone ahead. The online feedback survey established that, for all respondents that achieved job outcomes, the average attribution level was 68% per cent. This means that 32% of the impacts would have occurred anyway (deadweight). Given this is only based on a sample of beneficiaries, it is also relevant to consider established literature regarding deadweight. The Homes and Communities Agency (HCA) Additionality Guide[30] provides a deadweight ready reckoner for business support projects of 46%. Therefore, we have used the midpoint between the deadweight identified in the survey and the ready reckoner, providing a proxy value of 39%.

  Deadweight = 39%

- **Displacement** represents the number or proportion of outputs accounted for by reduced outputs elsewhere within the target geographical area. For example, the jobs created by a DR&I supported business may displace jobs from a business elsewhere in the region that did not receive support. A low displacement ready reckoner (25%)[31] was selected because:
  - the project covered a wide geographical area, meaning the likelihood of displacement was lower than in a more restricted geography
  - the focus of the project was not upon immediate direct economic impacts
  - the support provided, and many of the SMEs engaged, was relatively specialist

  Displacement = 25%

- **Leakage** represents the number or proportion of outputs that benefit those outside of an intervention's target area or group. In relation to DR&I, this refers to any expenditure, employment or GVA generated that is leaked out of the D2N2 geographical area or was achieved by ineligible businesses. As the project was specifically targeted at businesses

[30] HCA (2014) Additionality Guide
[31] HCA (2014) Additionality Guide

within the D2N2 area, with defined eligibility criteria, it is likely to have experience minimal leakage. Therefore, a low ready reckoner of ten per cent[32] is applied.

Leakage = 10%

- **Economic multipliers** reflect further economic value associated with the additional income to those employed as a direct result of an intervention, as well as additional value within business supply chains (these are termed *induced* and *indirect* effects). The multiplier effects of business support interventions are well established within research literature. Guidance refers to the use of an average economic multiplier ready reckoner of 1.5 at the regional (D2N2) level.[33]

Economic multiplier = 1.5

5.45 Using the figures above, the calculation of net economic impacts can be made based on the summative assessment guidance – the figures below include jobs created *and* safeguarded and are extrapolated from the evaluation survey. This is shown below.

Figure 5.4: Gross to net calculation (net economic impacts from survey)

Impact indicator	Additionality Factor	Measure	Adjustment
Jobs Created and Safeguarded	Gross impact	214	n/a
	Deadweight	131	39%
	Displacement	98	25%
	Leakage	88	10%
	Net additional	**132**	1.5 multiplier
Gross Value Added (GVA)	Gross impact	£10,660,654	n/a
	Deadweight	£6,502,999	39%
	Displacement	£4,877,249	25%
	Leakage	£4,389,524	10%
	Net additional	**£6,584,286**	1.5 multiplier

Source: Carney Green (April 2023)
Note: the treatment area is the D2N2 region and the timescale is for the duration of the project

5.46 The above headline figures represent 'one-off' benefits. However, in reality these benefits will persist. Applying a 10-year persistence period and discounting at 3.5 per cent (in line with HM Treasury Green Book guidance), the overall GVA benefit from the jobs created and safeguarded would be £56.7m.

[32] HCA (2014) Additionality Guide
[33] HCA (2014) Additionality Guide

Performance against logic model outcomes and impacts

5.47 The original DR&I logic model, developed by the University of Nottingham at the outset of the project, included three outcomes and three impacts. Whilst some impacts will naturally occur over a longer time period, progress against each is summarised below – based on consultation, data and documentary evidence. Overall, this demonstrates positive achievement.

Figure 5.5: Progress against logic model outcomes and impacts

Logic Model Outcomes

- **Increased awareness within D2N2 SMEs of innovation needs:** The evaluation survey established that 89% of participants identified an improvement in their understanding the SMEs' innovation needs and opportunities. In total, 20% referred to very significant improvement, 33% to significant improvement, 28% to reasonable improvement, and 9% marginal improvement. Several SMEs explained how this had been enabled by specialist advice and research undertaken by the University.
- **Increased number of D2N2 SMEs networking for innovation:** All SMEs engaged in the DR&I project networked with the University, with the majority doing so for innovation purposes. In addition, the evaluation survey found that 59% had experienced improvements in their level of networking with other SMEs for innovation purposes (13% very significantly, 17% significantly, 20% reasonably and 9% marginally). Furthermore, 60% referred to improvements regarding signposting by DR&I to other business support, with several examples of handovers to expertise in the University and beyond.
- **Increased innovation capability within D2N2 SMEs:** The evaluation's survey established that 87% of participant SMEs had experienced improvements in their innovation capabilities. In total, 20% reported very significant improvements, 37% significant improvements, 26% reasonable improvements and 4% marginal improvements. There were several examples provided by SMEs of how the project's support had directly enabled enhanced innovation capability.

Logic Model Impacts

- **Increase the number of D2N2 SMEs who are actively collaborating with a research institution:** All SMEs engaged in the DR&I project directly collaborated with a research institution. In addition, of these, 72 progressed to an increasingly detailed / lengthy collaboration which led to a C26 output. Further evidence of ongoing collaboration was provided by the evaluation survey, within which 78% referred to improvements regarding their long-term collaboration with the University (33% very significant improvements, 26% significant, 15% reasonable, 4% marginal). Examples were also provided of cross-departmental referral for SMEs within the University, as well as engagement with students.
- **Increase the number of D2N2 SMEs who are bringing new products and processes to market:** DR&I data demonstrates that 16 C28 outputs are expected to be achieved by the end of the project, all of which represent new to the market products. Consultation with SMEs during the evaluation identified several examples of how the project had helped to support the development of new products and processes, whilst the evaluation survey found that 56% of project participants had created a new product or process, and a further 29% were in the process of doing so.
- **An uplift in regional productivity above the current 82% of the national average:** Whilst it is not possible within the remit or timescales of this summative assessment to assess any changes to the regional productivity level and determine the impact of DR&I upon this, feedback from participant SMEs did identify improvements in their level of productivity – this was evident for 69% of survey respondents (9% very significant improvement, 29% significant, 24% reasonable, 7% marginal). Several examples were provided by SMEs of how the project had enabled this, such as the development of enhanced components or advice to support improved processes.

Source: Carney Green (2023)

Outcomes for the University of Nottingham

5.48 Delivery of the DR&I project not only enabled benefits for participant SMEs and the regional economy, but also simultaneously provided benefits to the University of Nottingham. Naturally, these were most relevant to the three centres (and their departments / faculties) that directly delivered the project. Examples of such benefits are outlined below:

- **Enhanced engagement with the local SME community:** Although a proportion of businesses supported through the DR&I project had previously engaged with the University, feedback from SMEs and stakeholders highlighted that many had not. The project therefore provided an excellent means of enhancing the level, quality and depth of engagement between the University and the local SME community. This engagement not only provided excellent immediate joint working opportunities, but will also support future activity to the benefit of both parties (see below).

  "The project enabled us to interact with lots of businesses. We now have a group of around 70-75 SMEs [not all from the DR&I project specifically] that we connect with fairly regularly. They re-engage with us if they have specific support needs, they refer other businesses to us, and equally we can engage with them for various purposes such as supporting our research activities or discussing challenges." [CIL representative]

- **Development of ongoing collaboration with the SMEs:** Building on the previous point, delivery of the DR&I project enabled ongoing and deeper collaborative working between the University and SMEs. This occurred within the project itself through its C26 outputs, as well as through subsequent non-project activities. Examples referenced included:
  - SMEs being introduced to academics within various areas of the University
  - Delivery of joint long-term research projects (there were several specific examples of DR&I beneficiaries subsequently undertaking large research projects with other parts of the University)
  - SMEs supporting, or being part of, bids for research funding
  - SMEs supporting the delivery of apprenticeship programmes within the University, engaging with students and academics to help develop the innovation ecosystem

  "Richard Worrall and Annie Blissett have offered key support to drive improvement to my SME. They have connected me with other key areas of Nottingham University and I am now able to support two other areas in research - supporting a project for the students in Biosciences and supporting as a mentor with the Ingenuity Lab." [DR&I beneficiary]

- **Knowledge development:** Each of the three centres referenced how engagement and collaboration with SMEs via the DR&I project had enabled the development of additional knowledge and expertise within the centres themselves – linked to the diversity of SMEs and projects associated with them

- **Student engagement opportunities:** The DR&I project helped support the University to generate opportunities for directly engaging students with SMEs and 'live' projects. This was particularly significant within the FIC, which provided various links between students and SMEs including a summer MSc project, engagement between NPD students (typically within Food Science degrees) and SMEs to deliver 'real life' projects, and students being

placed within SMEs for a full year. A specific example directly linked to the DR&I project occurred with Foodprint, a social enterprise which runs a social supermarket and redistribution network in Nottingham. Food Science students, supported by the FIC, identified a method of transforming almost stale bread into a new product (fried dough balls) with a far longer shelf-life – therefore utilising surplus bread and cutting food waste.

- **Reputational benefits:** As a result of the successful engagement with SMEs, and the associated projects undertaken with them, the University enjoyed an enhanced reputation among the SME community. This was clearly evident when consulting participant SMEs, many of whom referenced the high quality of support and their willingness to engage in future joint working.

6. Value for Money Assessment

6.1 This section analyses the project's value for money.

Unit costs

6.2 Unit costs are calculated using project expenditure data divided by outputs achieved, for each type of indicator. Figure 6.1 below provides 'forecast' unit costs, based on DR&I's agreed original expenditure and output targets (note these did not change as a result of the PCR), as well as its projected final achieved unit costs, based on performance data shown in Section 3.

6.3 *It is important to recognise when reviewing the table below that the project was not focused on job creation within its immediate lifetime. Hence the C8 unit cost below appears particularly high; in reality this figure is probably a significant underrepresentation of the project's job creation impact (based on feedback from beneficiaries). This partly demonstrates the inability of ESIF output indicators to fully recognise the true benefits of interventions.*

Figure 6.1: Profiled and achieved unit costs

Indicator	Original forecast unit costs	Achieved* unit costs
C1: Enterprises receiving support	£19,446	£26,668
C4: Enterprises receiving non-financial support	£19,446	£26,668
C5: New enterprises supported	£311,128	£311,128
C8: Employment Increase in supported enterprises	£388,910	£666,703
C26: Enterprises cooperating with research entities	£38,891	£64,818
C28: Enterprises supported to introduce new to the market products	£311,128	£291,683
C29: Enterprises supported to introduce new to the firm products	£155,564	£179,497

** based on projected final output and expenditure performance*
Source: Carney Green, adapted from data provided by the University of Nottingham (April 2023)
Note: Unit costs (forecast and achieved) for ERDF-only expenditure would be 50% of those above

6.4 Figure 6.1 shows that the project's unit costs were higher than originally forecast for its C1 / C4, C8, C26 and C29 outputs – this was due to the original output targets not being achieved but the original level of expenditure being fully defrayed. In contrast, the unit costs for C5 and C28 outputs were the same and lower than originally forecast.

6.5 From a purely unit cost perspective therefore, the DR&I project underachieved – whereby several output targets were not met despite full expenditure being defrayed. However, this does not provide a full or realistic picture regarding value for money, particularly given the following:

- The wide ranging outcomes and impacts evidenced by participant SMEs and detailed within Section 5 – which are not recognised by the ERDF the outputs
- The likelihood that some of the outputs may represent an underrepresentation of actual benefits, for example the evaluation survey indicates a significantly greater level of job creation than the project's official C8 output
- The highly bespoke (one-to-one) and technical level of provision given to participants
- The high quality of the support provided, as recognised by feedback from participants
- The fact that the majority of participants (75%) received significantly more than 12 hours' of support

6.6 In reality, other projects will demonstrate lower unit costs than DR&I but will have provided a large proportion of support through delivering one-to-many events to large proportions of their participants – whilst this approach may be appropriate and beneficial to some businesses, it is a completely different type of support to that within DR&I.

Benchmarking

6.7 It is difficult to ascertain what constitutes 'good' value for money without reviewing data against comparator interventions. Unfortunately, there is relatively limited literature or data available in this respect. However, Carney Green has developed a series of unit costs based on its recent range of evaluations for ERDF-funded SME-focused support projects, many of which included an innovation focus. Whilst these are not wholly the same intervention types, and should therefore be treated with caution, they do provide some opportunity for comparison.

6.8 Furthermore, output unit cost guidance provided for the ERDF 2014-2020 programme,[34] whilst recognising the significant output cost variation across programmes,[35] gives mean and median suggested unit costs for based on analysis of 1,185 previous interventions. These, together with unit costs of other interventions evaluated by Carney Green, are shown alongside the DR&I project in Figure 6.2 below regarding C1 and C4 outputs (comparator interventions have been anonymised).

[34] Regeneris Consulting (2013) England ERDF Programme 2014-20: Output Unit Costs and Definitions
[35] For example, a business assist (i.e. a C1) can range from two days' (i.e. six hours per day) active consultancy advice or other non-financial assistance, to a significant grant award, or attendance at a series of one-to-many events

Figure 6.2: Value for money benchmarking

Project	Cost per enterprise assist (C1)	Enterprises receiving non-financial support (C4)
DR&I	**£26,668**	**£26,668**
Project A: Masterclasses, 1-2-1 advice and grants	£5,808	£8,508
Project B: 1-2-1 advice, workshops, volunteer mentoring and online guides	£6,510	£6,510
Project C: 1-2-1 advice, workshops/seminars and grants	£25,536	£32,654
Project D: 1-2-1 advisor-led support and a series of workshops	£5,774	N/A
Project E: University-led project providing wide-ranging support within a dedicated physical hub	£18,309	£18,309
Project F: University-led support for via workshops and grants	£11,197	N/A
Project G: University-led support for SMEs via academic engagement, access to facilities and grants	£26,219	N/A
Project H: Events, peer networking, grants and mentoring	£15,458	N/A
Project I: Enabling SMEs to work with local universities via accessing research, and innovation services	£16,869	N/A
Project J: University-led, assisting SMEs to access supply chains	£12,555	£12,555
2014-2020 programme: indicative guidance (median)	£11,549	N/A
2014-2020 programme: indicative guidance (mean)	£38,497	N/A
2014-2020 programme: indicative guidance (recommended cost/output)	£11,323	N/A

Source: Carney Green (2023)
Note: all figures have been adjusted for inflation

6.9 As would be expected given the very tailored and technical nature of DR&I, its unit costs per business assist are above average when viewed against comparators – although not always significantly so. It is also notable that many of the comparator interventions incorporated workshops and events as part of their provision, which lend themselves to lower unit costs.

Benefit cost ratio

6.10 Whilst the calculation of DR&I's estimated GVA contribution in Section 5 should be treated with caution and is based only on employment outcomes, it does enable an outline Benefit Cost Ratio (BCR) to be estimated for the project. Utilising the discounted 10-year persistence benefits alongside the overall costs of the project, the BCR would be 12.14; whereby £12.14 is generated for every £1 spend.

6.11 Applying sensitivity testing based on specific positive and negative scenarios, the BCR would change as follows:

- A 15% reduction in jobs created / safeguarded would generate a BCR of 10.32
- A 15% increase in jobs created / safeguarded would generate a BCR of 13.97
- Utilising the deadweight figure from the evaluation survey (32%) would generate a BCR of 13.54
- Utilising the deadweight figure provided by HCA guidance (46%) would generate a BCR of 10.75

7. Conclusions and Lessons Learnt

7.1 In line with summative assessment guidance, this section provides headline findings by identifying the DR&I project's strengths and the challenges it faced. It concludes with a series of lessons learnt / recommendations.

Project strengths

7.2 Specific (but not exhaustive) strengths of the project are summarised below.

- **Project design was informed by learning from its predecessor (Enabling Innovation)**, with a greater focus on deeper, longer and more meaningful interventions – as well as being **recognisant of existing market failures**
- The delivery of **high quality, bespoke and intensive support to SMEs**, based on each participant's specific requirements – rather than a broad brush approach to provision
- The project, although not achieving its C1/C4 volume-specific outputs, **provided support in excess of 12 hours for the majority of SMEs it did assist**
- Providing, for SMEs, a **combination of technical, scientific and business-related expertise alongside the availability and application of high-spec equipment and technology**
- Delivery of **initial review and advisory support through an unbiased and non-transactional lens** – helping to identify the most appropriate solutions to challenges faced
- Provision of a **supportive account management and critical friend role** for SMEs
- **Access, through direct referrals and warm handovers, to a wide range of varied expertise within and beyond the University** – therefore acting as a 'front door' to the University and delivering a navigation / brokerage role
- **Feedback from SME participants (via a range of different sources) was overwhelmingly positive**, with 90% stating the support was above standard quality and 83% stating it completely met or exceeded expectations (of which 51% said expectations were exceeded)
- The generation of **varied and significant outcomes for participant SMEs**, including innovation activity, product / process development and economic benefits – as well as several examples of projects delivering environmental benefits
- The **continued engagement and collaboration between SMEs and the knowledge base**, both within and beyond the DR&I project – with examples of long-term joint working
- **From a supply perspective, the impact of Covid-19 on project delivery was minimised** by pivoting to alternative delivery methods and through a relatively rapid re-opening of project spaces / laboratories
- The project implemented **an efficient, effective and consistent governance and management function** which built upon structures and processes from its predecessor

Challenges faced / areas for improvement

7.3 Specific challenges faced by the project are outlined below; in some cases these also represent potential areas for improvement.

- Despite providing detailed, bespoke and high quality support, **from a volume perspective the project failed to meet the majority of its ERDF output targets** – although it is recognised that the FIC performed positively from an output perspective
- The above underperformance from an output performance was primarily a result of a **reduction in the demand for innovation support as a result of the Covid-19 pandemic** (in contrast, the food and drink sector experienced increased demand for support)
- The performance also reflects the very deep and bespoke approach to supporting SMEs taken by the project – overall this is valued and beneficial, providing significant outcomes for participants – however, **this intensive delivery approach it was not necessarily aligned to ERDF-specific output targets**
- Due to the existing public sector business support funding climate in the UK, **there is (at the time of writing) uncertainty regarding the extent to which free to access services will continue to be provided by each of the three centres beyond the project –** which has the potential to significantly impact upon innovation activity among smaller and younger businesses
- Although such provision can generate negative behaviours, **several participant SMEs stated the project would have benefited from the provision of direct funding to support innovation** – it is, however, recognised that DR&I did support SMEs to access external funding in several instances
- Whilst the project's primarily devolved approach to marketing and promotion was broadly effective, **some SMEs highlighted the need for DR&I to further raise awareness of its provision and provide regular updates to the business community of support available within the University**

Lessons and Recommendations

7.4 This section outlines a series of lessons learnt for consideration by different audiences - some of these represent positive lessons from DR&I, as well as areas for potential improvement.

- Provision to enable innovation and productivity growth is generally more aligned to bespoke, intensive and sometimes lengthy delivery – funding regimes should be recognisant of this by reducing the focus on 'volume' outputs and not significantly limiting the number of hours for which support can be provided
- Targets for innovation (and many other) interventions should primarily be outcome (not output)-focused, therefore understanding their real and meaningful achievements (rather than simply what has been delivered) - consideration could therefore be given to developing a range of outcomes that recognise the widespread benefits of interventions such as DR&I

- Ideally, funding regimes should seek to limit or remove geographical restrictions upon support provided, recognising that economies do not operate in geographical isolation
- Recognising the bespoke and relatively specialist nature of support available through the three centres a targeted approach to the engagement of businesses (supported by research to identify them) appears to be most suitable – alongside broader awareness raising through networks, partner organisations and forums
- The importance of ensuring a relatively small and stable core project management function should not be underestimated - similarly, all interventions benefit from key resources being in place from their outset (something which rarely occurs within time-bound interventions benefitting from external funding)
- The above recommendation could be assisted by confirmation of funding being provided significantly (minimum six months) in advance of interventions commencing, with projects also incorporating a dedicated mobilisation period
- There are benefits to be obtained from the early appointment, in the lifetime of interventions, of evaluators – such benefits can include support to develop monitoring and measurement frameworks, the effective and ongoing engagement of beneficiaries, and the provision of helpful feedback and learning throughout the life of the intervention
- Wherever possible, funding regimes should seek to support the ongoing delivery of provision, rather than there being significant gaps between interventions – such gaps can significantly reduce momentum, generate inefficiency, and incur both a lack of support and confusion for target beneficiaries
- The importance of free to access innovation support should not be underestimated, providing pre-starts, start-ups, micros and SMEs with the ability (through access to expertise and equipment) to de-risk innovation and enable enhanced growth and productivity – this is critical to the economy
- Whilst there will be opportunities for the three centres (engaged in DR&I) to further develop income from transactional work and private sources, it is clearly disappointing that there is currently limited public funding available to continue the DR&I provision – furthermore, the distribution of the UK Shared Prosperity Fund (SPF) at local authority level has the potential to limit wider cross-geographical interventions and reduce focus on themes with less obviously direct links to smaller geographies (including innovation)
- Given the allocation of UK SPF, it may be a consideration for several local authorities to combine some of their UK SPF resources to enable themes such as innovation to be supported and delivered across broader geographies – utilising the expertise of local knowledge and innovation assets

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