



Biorenewables Development Centre
Anaerobic Digestion Circular Economy Yorkshire
ERDF Summative Assessment

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Executive Summary

This is the Final Evaluation of the ERDF Funded Anaerobic Digestion and Circular Economy Yorkshire (ADCEY) project delivered by the Biorenewables Development Centre (BDC) in the Leeds City Region (LCR) and York and North Yorkshire (YNY) Local Enterprise Partnership (LEP) areas.

Context

The ADCEY projects seek to build on the expertise and experience of the BDC to help drive the growth and continued development of Anaerobic Digestion (AD) and Circular Economy (CE) across the two LEP areas. The area has a strong base on which to further develop economic activity in these areas and support the transition to net zero and considerable wider potential to develop a critical mass of activity and take advantage of emerging areas of opportunity.

The project forms one of a number of publicly funded business support programmes delivered by the BDC which focus on supporting the growth and development of the wider bioeconomy and specific subsectors or technologies within it; alongside other activities including commercial research and grant funded Research & Development (R&D) activities. The core objectives of the ADCEY project is to:

- To deliver comprehensive feasibility analysis on AD feedstock availability and deployment of commercial AD technologies in YNY and LCR regions;
- To support regional enterprises in development of innovative products and processes based on anaerobic digestion;
- To establish a “plug and play” facilitates to scale-up AD-based processes;
- To develop cluster development activities that build business-to-business and business-to-university interactions to support research, AD innovation and growth of AD sector; and
- To develop a detailed business plan for Circular Malton.

Progress

The project performed well against spend and output targets with pipeline data and scheduled SME support activities suggesting the project will fulfil these by project closure.

Delivery and Management

The project has been delivered by four BDC teams whose roles sit under three main activities strands:

- Business development – the primary roles for the Business Development Unit (BDU) team include identifying and engaging businesses to be assisted, delivering an initial diagnostic or needs assessments and developing individual businesses proposal for their business support under the projects. The team also supports the SME throughout the delivery of their project and may refer businesses on for further support. Members of the BDU team also deliver direct support projects to SMEs, particularly where these require less technical desk-based research or more general start-up or business support rather than more technical or laboratory-based expertise.
- Technical delivery – there are two technical delivery teams at the BDC, the Process Development Unit (PDU) and the Bioscience Innovation Team (BIT). These lead on providing technical support to SMEs and offer highly specialised expertise and activities, with a particular focus on laboratory-based support.

- BioVale Cluster support – members of the BioVale team help to identify, engage and signpost potential beneficiary SMEs for the project. They also provide some direct project support to SMEs, particularly where businesses require marketing or showcasing based support.

Project delivery has proved effective, being valued by beneficiaries and responding to emerging needs and challenges and is forecast to achieve output and expenditure targets by project closure, with no significant challenges identified by project delivery staff. Additionally, the extensive BDC and BioVale network of local, national and international businesses and research and support organisations added considerable value to the project.

Consultation with project staff and beneficiaries, and analysis of project data and documentation, suggested the project has been managed well; with beneficiaries and stakeholders agreeing that the project delivered intended activities to a high standard.

Outcomes and Impact

The project has made a positive contribution towards its intended outcomes and impacts, generating positive outcomes within supported businesses and contribution positively to the regional innovation infrastructure by delivering or supporting the delivery of:

- To deliver comprehensive feasibility analysis on AD feedstock availability and deployment of commercial AD technologies in YNY and LCR regions;
- To support regional enterprises in development of innovative products and processes based on AD;
- To establish “plug and play” facilities to scale-up AD-based processes;
- To develop cluster development activities that build business-to-business and business-to-university interactions to support research, AD innovation and growth of AD sector;
- To develop a detailed business plan for Circular Malton;
- A higher level of innovation of AD- based technologies;
- A more productive economy in Yorkshire with well-paid, knowledge-based jobs; and
- Generate new well-paid, highly skilled jobs that will drive the productivity of the region in the bioeconomy sector and increase the competitiveness of the region.

Strategic Contribution

The objectives of the project are aligned with a number of national and regional strategic priorities, including innovation and the net zero agenda. The projects were also designed to align with and contribute to a number of regional priorities across both LEP areas and those within the ERDF Operational Programme. The project therefore demonstrates good strategic added value at a regional level through alignment with regional priorities and ambitions.

Strengths

The Summative Assessment has highlighted a number of the project’s key strengths, including the:

- Delivery partners reputations and networks;
- Diversity and depth of expertise and facilities;
- Delivery team integration;
- Scale of support interventions, enabling support of SMEs who would not warrant a research project and could not afford commercial support to access support to help them innovate;

- Outcome and outcomes focus to ensure that supported SMEs are provided with something tangible and meaningful from the support provided, enabling them to progress as a business or for their innovations to progress;
- Efficiency, with processes for BDC delivered ERDF projects having been refined over a number of years, with well-established and understood information collection and monitoring processes to ensure compliance;
- Depth and breadth of eligible SMEs, as focusing on AD and the wider CE as a whole means the projects can support SMEs engaged in a wide range of economic activities and the development or potential development or application of products/services/process from across the bioeconomy;
- Strategic alignment with the broader policy context and the innovation infrastructure has played an important role within the projects. Effective integration ensures the projects have a strong understanding of, is shaped by and helps to connect the wider innovation offer available to SMEs;
- Sustaining Delivery through the COVID-19 pandemic, while some other ERDF business support projects either suspended or stopped delivery and brought their project to an early closure or struggled to engage and support SMEs and achieve their output targets.

1. Project Context

This is the final summative assessment of the European Regional Development Fund (ERDF) supported Anaerobic Digestion and Circular Economy Yorkshire (ADCEY) project led and managed by the Biorenewables Development Centre (BDC) in the Leeds City Region (LCR) and York and North Yorkshire (YNY) Local Enterprise Partnership (LEP) areas. The project was funded from October 2020 to June 2023.

1.1 Objectives

What was the project seeking to do?

What is Anaerobic Digestion?

'Anaerobic Digestion turns waste materials into renewable energy and nutrient rich fertiliser and is seen as a crucial technology to increase the sustainability of industry, reduce carbon emissions and is seen as vital in helping the region move to a low-carbon, circular economy'

[Anaerobic Digestion and Circular Economy Yorkshire project - York Environmental Sustainability Institute, University of York](#)

ADCEY Objectives

To deliver comprehensive feasibility analysis on AD feedstock availability and deployment of commercial AD technologies in YNY and LCR regions

To support regional enterprises in development of innovative products and processes based on anaerobic digestion

To establish "plug and play" facilitates to scale-up AD-based processes

To develop cluster development activities that build business-to-business and business-to-university interactions to support research, AD innovation and growth of AD sector

To develop a detailed business plan for Circular Malton

[ADCEY ERDF Summative Assessment Logic Model](#)

The ADCEY project sought to build on the expertise and experience of the BDC to help drive the growth and continued development of Anaerobic Digestion (AD) and Circular Economy (CE) across the LCR and YNY LEP areas. The area has a strong base on which to further develop both CE and AD and considerable wider potential to develop a critical mass of activity and take advantage of emerging areas of opportunity. In particular it has a wide range of SMEs and larger organisations which comprise important parts of the existing and potential supply chains that both deliver and utilise AD and CE opportunities.

The project forms one of a number of publicly funded business support programmes delivered by the BDC which focus on supporting the growth and development of the wider bioeconomy and specific subsectors or technologies within it; alongside other activities including commercial research and grant funded Research & Development

(R&D) activities. As a consequence, the project forms one of a number of pathways through which the BDC utilise their commercial and technical expertise to support new and existing SMEs across the two LEP areas.

The core objectives of the ADCEY project was to drive the growth of a low carbon Circular Economy through commercial deployment of anaerobic digestion (AD) technology:

- Enhance regional knowledge and understanding of opportunities AD and CE;
- Drive AD and CE focussed innovation, productivity and growth;
- Support businesses to investigate, create and/or refine products, processes and services in AD and CE;
- Support the ongoing development of the regional cluster of AD and CE businesses and strengthen networks between them and both nationally and internationally;
- Working with other business support organisations to enhance the collective impact of interventions on businesses.

The project therefore sought to deliver tangible benefits to individual benefits while simultaneously seeking to enhance the regional bioeconomy and connectivity between local businesses and the wider support eco-system.

The principal mechanisms or funded activities for achieving these objectives, can be broken down into seven work packages (WPs):

- **WP1: Waste Auditing and Mapping** – including detailed auditing and seasonal and spatial mapping of wastes available in the LCR and YNY areas for use as feedstock for AD. Current utilisation in existing markets and the potential for added value through increased AD capacity was also explored.
- **WP2: Research, Development and Demonstration** – this work package sought to bridge the gap between laboratory development and commercial manufacture of innovative low carbon or carbon-negative bio-based products and processes. This involved running a package of problem-driven, desk, consultancy, laboratory- and demonstration-scale business assists, each for a duration of up to 12 weeks with regional SMEs to support the development of innovative technologies based on AD. These assists aimed to address major challenges in anaerobic digestion and were designed following consultation with the business to address the company's major challenges, ambitions and key opportunities.
- **WP3: Containerised AD Programme** – procurement of demonstration scale- AD facilities to enable larger scale AD trials to de-risk commercialisation of innovative AD processes. Access to suitable testing facilities is a major barrier to growth and innovation of AD and at the time of developing the project there was no such facility in the UK.
- **WP4: Circular Malton Impact Assessment** – delivery of a comprehensive environmental, techno-economic, regulatory, commercial and social assessment of commercial deployment opportunities for AD using analytical and comparative evaluation techniques. The study will use the market town of Malton as an exemplar for implementing AD technology and the circular economy concept where the waste produced by the community and businesses is used to run local AD facilities producing green gas for the town.
- **WP5: Community AD Site Analysis** – involving the identification of redundant and under-used Yorkshire Water operational sites and assess their suitability for a development of the community AD site.

- **WP6: Stakeholder Engagement and Communications** – involving stakeholder mapping and engagement with SMEs large businesses, public sector organisations and AD experts to raise awareness and develop collaboration and knowledge exchange to contribute to the growth of the AD sector.

Delivery of the project was supported by partners, including University of York¹, and Yorkshire Water²

1.2 Economic and Policy Context and Project Rationale

At the time the project was designed what specific market failures was the project seeking to address? Was there a strong rationale for the project?

The climate crisis has seen the UK Government set clear targets for the transition to net zero which will require a shift to clean economic growth and a regenerative low carbon circular economy which in turn requires the utilisation of a range of technologies and ongoing research and innovation to enhance and encourage the adoption of low carbon approaches.

Consequently, low or zero carbon product, service and process innovation and the creation of an enabling and supportive infrastructure, environment or ecosystem for this, underpins ambitions to drive productivity, competitiveness and inclusion across the UK and both LEP areas.

In addition, the region includes a number of major bioeconomy businesses and a broad range of SMEs engaged in or who have the potential to engage in the bioeconomy. Consequently, the area has a growing reputation as a leading area for the bioeconomy with bioeconomy assets providing considerable opportunities for delivering economic growth. This has been recognised by numerous revenue and capital support programmes being endorsed in the region.

In this context AD is a mature, readily available technology which sits at the heart of the circular bioeconomy and plays a significant part in the UK bioenergy landscape³; with previous government incentives such as Feed-In-Tariff (FIT) and the Renewable Heat Incentive (RHI) leading to an increase in the number of AD plants treating food and agricultural waste from 70 in 2011 to 486 in 2019⁴.

However, there are a number of challenges and barriers which impede AD growth and innovation across the region and within SMEs, in particular and would impact on the area's ability to reach its growth potential and opportunities to develop the sector. These include:

- lack of or instability of financial and political support;
- perception that AD is all about economies of scale;
- lack of access to larger scale testing facilities.

¹ Which specialises in the fundamental and applied research of AD and uses cutting edge DNA sequencing technologies to fully understand the microbiology of the AD processes.

² A water supply and treatment utility company, servicing the YNYER and LCR LEP areas.

³ AD is predicted to provide 3-19% of UK gas demand by 2050

⁴ <https://www.nnfcc.co.uk/publications/report-anaerobic-digestion-deployment-in-the-uk>

Furthermore significant innovation potential exists for AD in terms of efficiency gains and component level improvements; although R&D and access to appropriate facilities and expertise are essential to realising these. In addition, research undertaken by the BDC Market research showed that AD in the region could benefit from new underutilised feedstocks such as potato processing waste and outgrades as the region's potato farmlands account for 18% of the country's total; while the wider Yorkshire and Humber region accommodates over 37% of the pig population in England, making pig manure and slurry highly available AD resources. While there are a range of other opportunities presented through sewage sludge, agricultural wastes and residential waste.

Clearly rapid developments and transformation in AD and associated technologies make continuous adaptation fundamental to remain competitive and SMEs often struggle to have the capacity, expertise and resources required to innovate within this environment.

The level of interest in AD research and innovation has been demonstrated by the regional AD network convened by the BioVale team of the BDC. The BioVale runs a highly active AD special interest group, which has 280 members, demonstrating the demand for innovations in YNYER rural and LCR urban economies.

Another key area of market failure is the level of latent opportunity and subsequent demand for support within this field, particular from a supplier perspective. For example, some businesses whose existing economic operations present opportunities within AD, through the reuse of waste products or the adaption of processes, may not be aware of their potential. Therefore, there is a clear need to raise business awareness of the potential opportunities AD presents for their business.

Against this backdrop the ADCEY project was developed specifically to address the range of market failures and opportunities outlined above by delivering direct support to SMEs; enhance regional assets and facilities and working to enhance the connectivity of the innovation and development eco-system. As a result, there was a clear underpinning rationale for the project, as it was designed to help address some clear market failures and strategic priorities within the region, as outlined above.

1.3 Project Design

Was it appropriately designed to achieve its objectives? Was the delivery model appropriate?

As outlined above the ADCEY project was designed to specifically address the market failures identified above and support the development of AD within the region. The project was well designed with the support offering and underpinning client and project management processes having been refined over a number of successive and complementary ERDF programmes delivered by the BDC. In particular the combination of a defined package of support tailored to the specific business growth and development needs of individuals SMEs combined with activity to stimulate potential new community AD schemes; and awareness raising and showcasing activities to enhance engagement with and networking across the AD sector, ensures that the project worked towards achieving its micro and macro level objectives.

The project clearly benefitted from the BDC's extensive delivery of ERDF funded projects focussing on the bioeconomy or elements within it, as well as continuity of

personnel within the organisation. Consequently, the customer journey and aligned evidential requirements and processes are clearly defined, appropriately resourced and embedded at both organisational and individual levels with an appropriate Customer Relationship Management (CRM) system supporting this process. The extent of support to be provided to any one SME through the project is well documented within an agreed project proposal and scoping document and supporting timeline to ensure that there is a shared understanding of the scope of the support to be provided, thereby helping to manage beneficiary expectations. The customer journey for SME assists is shown in **Figure 1.1**, below.

Despite the project and direct support to SMEs being delivered across a number of teams and incorporating a wide range of potential technical and practical support, processes are in place to ensure effective joint working. This includes shared project pipeline meetings during which representatives from across the different BDC teams involved in the delivery of the programme discuss live projects/SME assists and potential SME assist projects and agree the best project delivery team. While consultees were largely in agreement that collaborative working across BDC teams was effective, one member of staff with a technical role suggested the project could benefit from greater technical involvement at the stage of scoping a project and assigning a project manager and project team. In addition, a member of the Business Development Unit suggested that their involvement in the diagnostic and project scoping process can sometimes be reduced when initial contact with the SME is initiated by a member of staff within one of the BDC's technical teams or the SME engages one of these teams, in the first instance.

However, both members of staff highlighted that these are minor issues and that project design and delivery processes are effective and well designed.

Collectively the project design and delivery features help to ensure the project avoided a number of delivery and project management challenges encountered by other ERDF projects.

Figure 1.2 below provides a summary overview of key elements of the delivery model against their contribution to the stated objectives of the project, as outlined with the project logic model and the full ERDF application form. This demonstrates that the Project delivery model was designed appropriately with the various strands of activity delivered through the project enabling it to directly achieve against its stated objectives.

Figure 1.1: Customer Journey Flow Chart

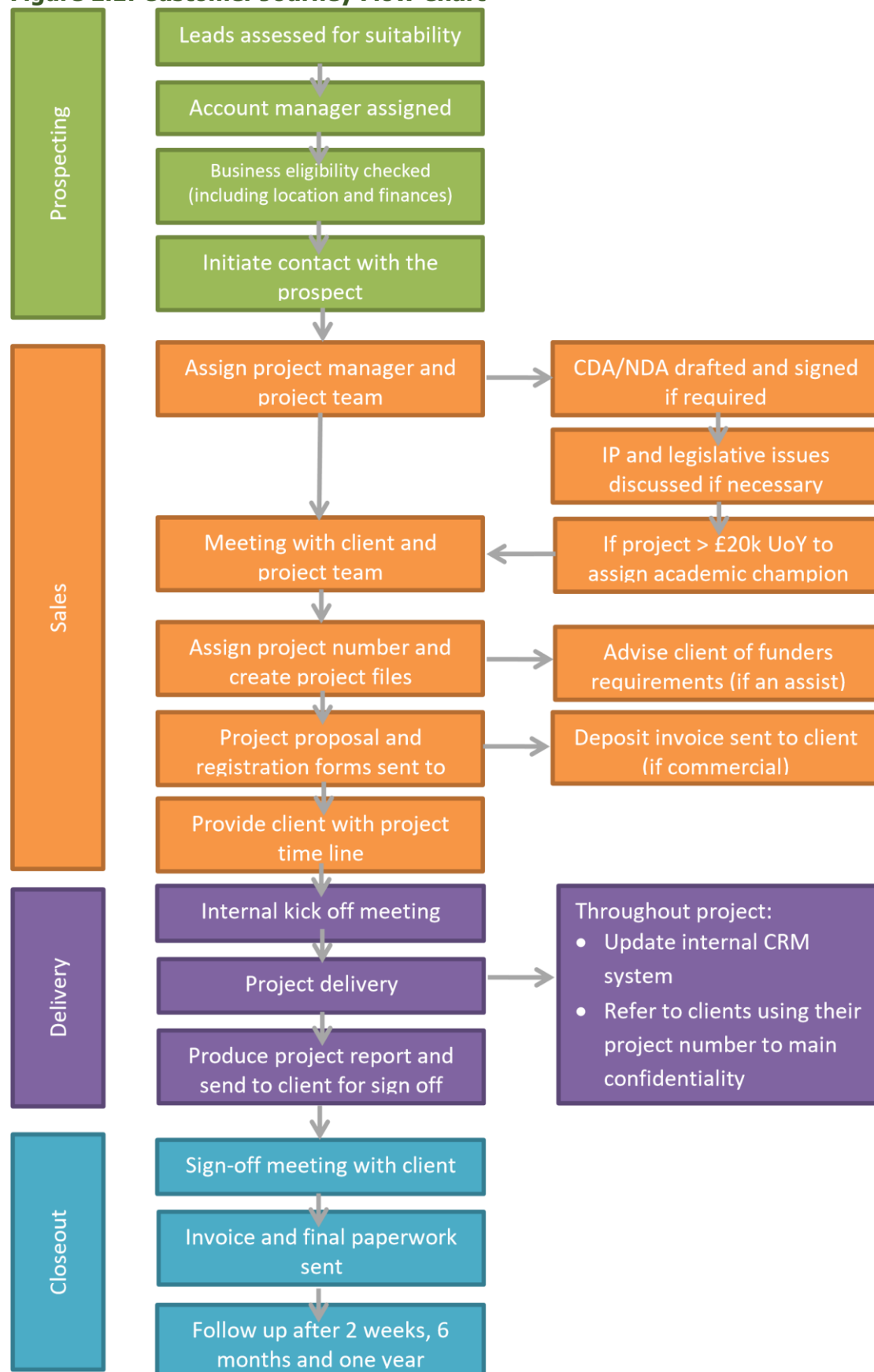


Figure 1.2: Appropriateness of the Project Model

Objectives	Relevant Delivery Features
1. To deliver a comprehensive evaluation of AD feedstock availability and potential for deployment of commercial AD technologies in YNYER and LCR LEP areas	Research to quantify potential feedstock available for the AD sector in YNY and LCR, including underutilised resources and identify geographic hotspots for AD.
2. To support regional enterprises in development of innovative products and processes based on anaerobic digestion	Direct support to SMEs is the mechanism through which the project has been designed to deliver this objective. This has involved working with enterprises and organisations on the supply (supplying AD resources) and demand (plant operators) sides, on problem driven laboratory scale assists including access to BDC and UoY R&D expertise and facilities to provide evidence and recommendations on process/product viability and commercial potential and opportunities.
3. To establish a “plug and play” facility to scale-up AD-based processes	Through the provision of containerised units to enable larger scale testing and optimisation of AD-based processes.
4. To develop cluster development activities that build business-to-business and business-to-university interactions to support industrial research, AD innovation and growth of AD sector	Regular stakeholder engagement activities were during the project; public consultations are facilitated to promote development of AD facilities in Malton; while knowledge exchange at events and workshops further supported AD based innovation within the region.
5. To develop a detailed business plan for Circular Malton	Delivery of an evaluation of the economic, environmental, political, regulatory and social considerations, focussed on Malton as an exemplar town, to allow an in-depth strategic business proposal to be developed that could be replicated across the region and beyond.

This delivery approach sought to provide a multi-level method to facilitating the growth and development of AD across both LEP regions, through direct support to individual SMEs and an enhanced and better-connected sector and support ecosystem with enhanced capacity and facilities. This included engagement activities to raise awareness and understanding of the benefits of key areas of opportunity alongside specialist support to facilitate the growth, development and potential commercialisation of new products/processes. The principle underpinning the model was therefore to stimulate interest and awareness of AD and demand for support while also providing opportunities for SMEs to access such support and take forward their opportunities and potential innovations.

The fundamental project model was therefore designed appropriately, directly addressing a number of challenges which are widely accepted as stifling bioeconomy innovation among SMEs.

1.4 Realistic Targets

Were the targets set for the project realistic and achievable?

Based on past experience and the proposed project delivery model the original output targets established were both realistic and achievable.

1.5 Externalities and the Effect of Shifting Context

How did the context change as the project was delivered and did this exert any particular pressures on project delivery?

Bearing in mind any changes in context or weaknesses in the project design/logic model, can the project reasonably be expected to perform well against its targets?

The context for project delivery shifted significantly in 2020 with the COVID-19 pandemic and the subsequent policy response by the UK government, significantly reducing the delivery of any face-to-face activity from mid-March 2020 onwards. Prior to that the projects had delivered a significant amount of initial engagement and scoping activities face to face as well as their various seminars and other events attended by or delivered by the project team. This required a pivot by the project delivery team and they responded proactively and rapidly to a remote method of delivery; and the BDC should be commended for the speed at which it was able to transition to such delivery.

However, consulted staff suggested no major challenges in recruiting participant SMEs through the pandemic, indeed a number suggested that the shifting context provided some SMEs with the capacity to adopt a more strategic outlook and consider and initiate some potential projects that they may not have had the time to consider otherwise.

The project responded promptly and well to the considerable challenges presented by COVID, thereby ensuring it could continue to reach and support SMEs and at a time when other projects suspended delivery or closed early. Consequently, the project performed well against its targets as outlined in **Section 2**, below.

2. Project Progress

2.1 Inputs and Outputs

Has the project delivered what it expected to in terms of spend and outputs?

ADCEY was a revenue funded project with project expenditure and outputs achieved and forecast shown in **Figure 2.1**, below. It is provided in Table F.1 Standard Table Format: Spend and Output Performance, as required by ERDF Summative Assessment Guidance. It should be noted that the project was fully funded from an SME perspective with beneficiaries not required to provide their own match funding.

Figure 2.1: Spend and Output Performance

Indicators / Expenditure	Original Funding Agreement	Amount in most recent Funding Agreement Variation	Total achieved at time of evaluation	% of final target achieved	Achieved at project closure	% of final target achieved
ERDF Revenue Expenditure (excluding match)	£589,951.00	n/a	£429,513.71	73%	£491,203.21	83%
Public match expenditure	£589,951.00	n/a	£429,513.71	73%	£491,203.21	83%
Total project expenditure	£1,179,902.00	n/a	£859,027.41	73%	£982,406.41	83%
Outputs						
Number of enterprises receiving support (C1)	31	n/a	34	110%	34	110%
Number of New Enterprises Supported (C5)	3	n/a	7	233%	TBC	TBC
Number of Enterprises co-operating with a research entity (C26)	15	n/a	7	47%	TBC	TBC
Number of Enterprises supported to introduce new to the firm products or services (C29)	9	n/a	0	0%	TBC	TBC

Provisional output figures are provided as the project will run to 30 September 2023 and the project will continue to accrue as the project delivers support to enterprises through Summer. However, as of July 2023 the project had already exceeded its target for enterprises supported and new enterprises supported, which suggests it is well placed to achieve targets relating to new products and services and co-operating with a research entity. Consultation with project management and delivery team members suggests they are relatively confident of achieving outstanding targets by the end of the project.

3. Project Delivery and Management

3.1 Project Management and Governance

Was the project well managed? Were the right governance and management structures in place and did they operate in the way there were expected to?

The project has been governed and managed effectively with experienced and appropriately qualified staff and procedures in place to monitor overall performance and strong compliance structures and checks in place as part of the project management process. Such processes and management and governance arrangements are examples of good practice, with the projects avoiding numerous management and delivery related challenges found in other ERDF projects. The project clearly benefitted from the BDCs strong track record in delivering similar ERDF funded and bioeconomy focussed business support programmes to SMEs with the organisation having learned from their previous experiences and management and governance structures and processes being adapted and refined to enhance their effectiveness.

Operational management of the project, from a financial and delivery perspective is therefore provided by the BDC Management Team, with strategic oversight provided by the BDC Board which includes representatives of the UoY's Biology, Chemistry and Finance Departments.

Project management is effective with the project implementing clear structures to facilitate information sharing across the four BDC teams and partners involved in delivery of the project (see **Section 3.2**, below) with processes in place to ensure that teams and key staff are in regular contact. This was highlighted by a number of staff members as important to the effectiveness and integration of different activities and teams, helping to facilitate cross-team collaboration to the benefit of supported SMEs.

3.2 Project Delivery

The project was delivered by four BDC teams whose roles sit under three main activities strands:

- Business development – the primary roles for the Business Development Unit (BDU) team include identifying and engaging businesses to be assisted, delivering an initial diagnostic or needs assessments and developing individual businesses proposal for their business support under the project. The team also supports the SME throughout the delivery of their project and may refer businesses on for further support. Members of the BDU team also deliver direct support projects to SMEs, particularly where these require less technical desk-based research or more general start-up or business support rather than more technical or laboratory-based expertise.

- Technical delivery – there are two technical delivery teams at the BDC, the Process Development Unit (PDU) and the Bioscience Innovation Team (BIT). These lead on providing technical support to SMEs and offer highly specialised expertise and activities, with a particular focus on laboratory-based support.
- BioVale Cluster support – members of the BioVale team help to identify, engage and signpost potential beneficiary SMEs for the project.

It should be noted that no posts are 100% funded by the project.

Project delivery has proved effective, being valued by beneficiaries and responding to emerging needs and challenges and is expected to achieve most of its output targets by project closure, with no significant challenges identified by project delivery staff.

The extensive BDC and BioVale network of local, national and international businesses and research and support organisations added considerable value to the project, particularly including the provision of potential supply chain and ongoing support opportunities for businesses engaged and supported through the ADCEY project.

3.2.1 Delivery Standards

Has the project delivered its intended activities to a high standard? Could the delivery of the project have been improved in any way?
How are project activities perceived by stakeholders and beneficiaries? What are their perception of the quality of activities/delivery?

As part of the Summative Assessment process all businesses claimed as an output by were provided with the opportunity to participate in a consultation process. A total of 7 SMEs responded to the questionnaire, equivalent to 58% of the SMEs supported and claimed as an output by project closure.

The projects are clearly valued by SME beneficiaries with 100% of those consulted rating the support they received as being extremely useful (83%) or useful (17%) to their business.

Figure 3.1: How Useful was ADCEY support to your business

	% of SMEs
Extremely useful	83%
Useful	17%
Neither	0%
Not useful	0%
Not at all useful	0%
Total	100%

Supported SMEs were able to access a variety of tailored support for their business from laboratory-based testing, investigative, analytical or process development work; to desk-based activity to support the development of start-up or existing businesses or review potential AD opportunities or options.

As part of the consultation process, supported businesses were provided with the opportunity to summarise the nature of the support they received from the ADCEY, with responses provided in **Figure 3.2**, below.

Figure 3.2: Summary of Support Provided to Consulted SMEs

Brief description of ADCEY Assist
An exploratory brief to examine strategies for company development and revenue generation. Initial ideas related to potential overseas markets or greenhouse gas monitoring services to complement our existing products.
Mapping for food and drink, liquid and green waste streams and disposal routes including AD. Help to navigate waste stream data from EA and LA sources.
Research into the AD potential of feedstocks
Discussions and introductions to companies providing materials that may be able to be injection moulded now or in the future.
Several projects to help us understand ammonia emissions in slurry (pig & cattle)
A better understanding of the technical, cost and maintenance issues relating to Anaerobic Digestors including different feedstocks, suitable sites and energy output and biproduct use. Contact shared with a project in Malton that is in progress and circular York - both very useful contacts

Figure 3.3 provides further insight into the nature of support provided through the project as it provides an overview of the support projects in the overall project pipeline for ADCEY. It should be noted that not all of these will have been claimed as outputs by the end of the project.

Figure 3.3: ADCEY Summary of Support Provided to SMEs

Brief description of ADCEY Assist
BMP analysis of pig manure and chicken litter
Measuring effect of AD supplement on mixed feedstock digestibility
Recycling and valorisation of apple waste from spirit distillery
Use of rye crop as feedstock and enzyme additives for AD
Review of current trends in digestate treatment
Developing method for ammonia retention in plasma treated slurries
Impact of bio-supplement on biogas yield from pig slurry
Business support for NNFCC Ltd by building new connections at World Biogas Expo 2022
Support to attend ADBA Expo 2022CDA2
Review of management strategies for organic on-farm waste
Review of nutrient recovery from industrial wastes
Nutrient and microbial analysis of compost tea
Supporting business development for biogas and biofuel sectors
Help with comms/messaging to attract clients in the circular economy
Feasibility study of aquaculture waste for anaerobic digestion
Support with circular economy business development and export potential for products
Introductions within AD sector
Relocation to the area and networking support
Analysis of biogenic feedstocks for anaerobic mono-digestion
Waste reduction audit
Business support at ADBA Expo
Fatty acid analysis of seeds
BMP of liquid distillery waste
Use of digestate as feedstock for hexanoic acid production

SMEs therefore engaged with the projects and accessed their support for a variety of reasons. This was explored further in consultation with supported SMEs with respondents provided with a number of potential reasons for accessing ADCEY support and asked to pick which motivations were relevant to their decision to engage with the projects. Responses are summarised in **Figure 3.4**, below, which shows that the most common reasons for SMEs accessing support were to:

- Understand more about Anaerobic Digestion and the Circular Economy with 6 of 7 SMEs identifying this as a reason for accessing support;
- Explore the potential of a new Anaerobic Digestion or Circular Economy product, process or service with 6 of 7 selecting this reason;
- Explore the commercial opportunities through the re-use of by-products from existing processes and products for 5 of 7 SMEs;
- Enhance the efficiency of our operations through the re-use of by-products from existing processes and products for 5 out of 7; and
- Enhance the efficiency of our existing products through the use of new components or processes for 5 of 7.

This shows that most SMEs accessed support for a variety of reasons. Indeed, consultation with project staff revealed that the range of projects and types of beneficiaries supported was more diverse than they had originally anticipated with the project initially expecting to focus support on existing AD operators. However, the diversity achieved is clearly a strength

of the project as it has stimulated innovation among both the AD supply side (waste producers) and demand (operators and potential operators), thereby supporting the development of the growth of the whole sector.

Figure 3.4: Reasons for SMEs accessing ANCEY support

Reasons	No. of SMEs
Understand more about Anaerobic Digestion and the Circular Economy	6
Enhance the efficiency of our operations through reduced waste	4
Exploring the commercial opportunities through the re-use of by-products from existing processes and products	5
Enhancing the efficiency of our operations through the re-use of by-products from existing processes and products	5
Enhance the efficiency of our existing products through the use of new components or processes	5
Explore the potential of a new Anaerobic Digestion or Circular Economy product, process or service	6
Total	7

Supported SMEs that were consulted by the evaluation team spoke highly of the support received from the projects with many highlighting the skills and expertise of members of the ANCEY team:

'Great support and technical know-how from the BDC, facilitating new R&D partnerships and enabling development of new projects and associated funding bids.'

'The BDC provided skills and experience which we simply do not have in house and could not otherwise have sourced on the freelancer market.'

'BDC always help if they can and clearly know their stuff from top to bottom and we love the guys at BDC'

Many of the above testimonies, clearly demonstrate the degree to which businesses have or are keen to sustain relationships with the BDC, further demonstrating the value SMEs place on the support received through the project and other BDC interventions:

'we have developed an ongoing partnership with BDC'

'Strong partnership with BDC and York Uni, thanks to BDC support'

Indeed, 5 of the 7 SMEs consulted by the evaluation team identified an ongoing relationship with the BDC as a benefit from their engagement with the ADCEY project. Consequently, the wider role, support offer and networks of BDC is arguably one of the core strengths of their project with effective and proactive client relationship management helping to ensure the BDC continues to support many SMEs beyond their engagement with and over the medium to longer term.

A significant proportion of respondents also highlighted the important role that ADCEY support has played in giving them confidence to develop or enabling them to move forward with product or process innovations and diversify their economic activities.

'The information and support received was very helpful in shaping decisions moving forward with our project.'

'New information learned, new organisations introduced, partners brought together to further understand logistics and information - all aware of issues, benefits etc. We were unaware of bioproduct uses and issues prior to support. BDC shared useful contacts and are still in contact ...Ongoing communication with partners'

Consulted SMEs therefore identified a range of benefits from engaging with the project including brokering relationships and connections, enhanced innovation related awareness and understanding, improved investment readiness, proof of concept, creation of supply chain opportunities and helping to de-risk business investment. Indeed, consulted SMEs were asked to highlight the benefits generated through the support they had accessed. **Figure 3.5** shows the benefits obtained by the consulted SMEs.

Figure 3.5: Benefits obtained from ADCEY support

Benefits	No. of SMEs
Identified new business opportunities we will be taking forward	4
Secured new contacts and relationships to help support the ongoing development of new products/processes/services for our business	4
Learned more about Anaerobic Digestion and Circular Economy market and innovation opportunities	5
Learned more about the potential benefits of these areas to the company	3
Learned more about how to innovate	2
Increased business focus on innovation	4
Identification of a potential new or improved product, process or service	4
Launch of a new or improved product, process or service	1
Ongoing collaboration with the BDC	5
Increased and ongoing collaboration with other R&D providers	2
Ongoing collaboration with other businesses	4
Total	7

All of the consulted SMEs identified at least one benefit with the majority identifying multiple. The most commonly identified benefit from ADCEY support was with 'learned more about Anaerobic Digestion and Circular Economy market and innovation opportunities' or 'ongoing collaboration with the BDC' with 5 of 7 consulted SMEs selecting either of these, with 'identified new business opportunities we will be taking forward'; 'secured new contacts and relationships to help support the ongoing development of new products/processes/services for our business'; 'increased business focus on innovation'; and 'identification of a potential new or improved product, process or service'; and 'ongoing collaboration with other businesses' the next most popular benefits with each being selected by 4 of 7 consulted SMEs.

Collectively the evidence in **Figure 3.5** above demonstrates that the project has successfully provided supported SMEs with tangible benefits in relation to enhanced understanding of bioeconomy opportunities and/or identification, development or launch of new or improved product, processes or services for their businesses; as well as helping SMEs to develop networks and relationships that can help take these opportunities/products/services/processes forward. These responses also further emphasise the degree to which supported SMEs value the support provided by the project and the BDC as a whole.

'The support we received from BDC enabled us to connect with a range of new stakeholders across the circular economy landscape with a view to understanding their needs and existing market gaps, and how we can develop new services to meet this opportunity.'

'We learned alot but as with any lab trials they answer questions and raise others and get you thinking, or we would never keep developing and innovating nor would anyone else.'

'The project enabled early-stage exploration - if we hadn't of had the support, I doubt we would have even reached an exploration stage.'

'Brought partners together. Experienced AD supplier gave realistic advice and support. Very useful information regarding site requirements, storage needs, feedstock options, biproduct uses and costs. Links made with other groups.'

'As a new small business, we have multiple tasks to achieve with a small team so accessing this support was vital in enabling us to examine new potential sources of revenue generation. Without help, we wouldn't have had the resources to make this happen.'

These comments also highlight the role the project played in providing supported SMEs with potential pathways and recommendations for the ongoing development of their specific project, business and operations within the bioeconomy. This is a clear strength of the project and demonstrates considerable added value both for the businesses supported, the business and innovation support eco-system and the bodies that fund it, and ultimately the regional economy. Sustaining relationships helps to enable extended interactions and support, enabling businesses to enhance and develop their bioeconomy products, processes

or services over longer periods, thereby enhancing the impact of individual interventions such as the ADCEY project.

Collectively this evidence demonstrates that participants and stakeholders both felt that the various elements of the business support delivered through ADCEY are delivered to a high standard. Further evidence on the outcomes and impact of the project are provided in **Section 4**, below.

3.2.2 Beneficiaries

Did the project engage with and select the right beneficiaries? Were the right procedures and criteria in place to ensure the project focused on the right beneficiaries?

The project has engaged with a significant number of potential and actual beneficiaries, with a number of methods utilised to stimulate interest in, and raise awareness of, the project among SMEs and relevant stakeholders and intermediaries.

ADCEY benefitted from a multifaceted approach to raising awareness among potential beneficiaries, generating leads and engaging and recruiting participants. The reputation of the BDC, organisational and staff networks and the extensive networks, relationships and communication activities of BioVale each play a key role here.

Beneficiary SMEs consulted by the evaluation team were asked to report how they became aware of or engaged with the ADCEY project, with their responses shown in **Figure 3.6**, below. This shows that 3 of 7 had an ongoing relationship with or had previously worked with/been supported by the BDC; with the remaining 4 having been identified and contacted directly by the BDC due to their suitability for support. Again, this demonstrates the integral role the organisation plays in supporting the development of AD and the strength of their client relationship management processes and networks.

Figure 3.6: How Consulted SMEs heard about the support they accessed from the project

Source	No. of SMEs
Ongoing relationship/previously worked with the Biorenewables Development Centre	3
Direct contact from the Biorenewables Development Centre	4
Total	7

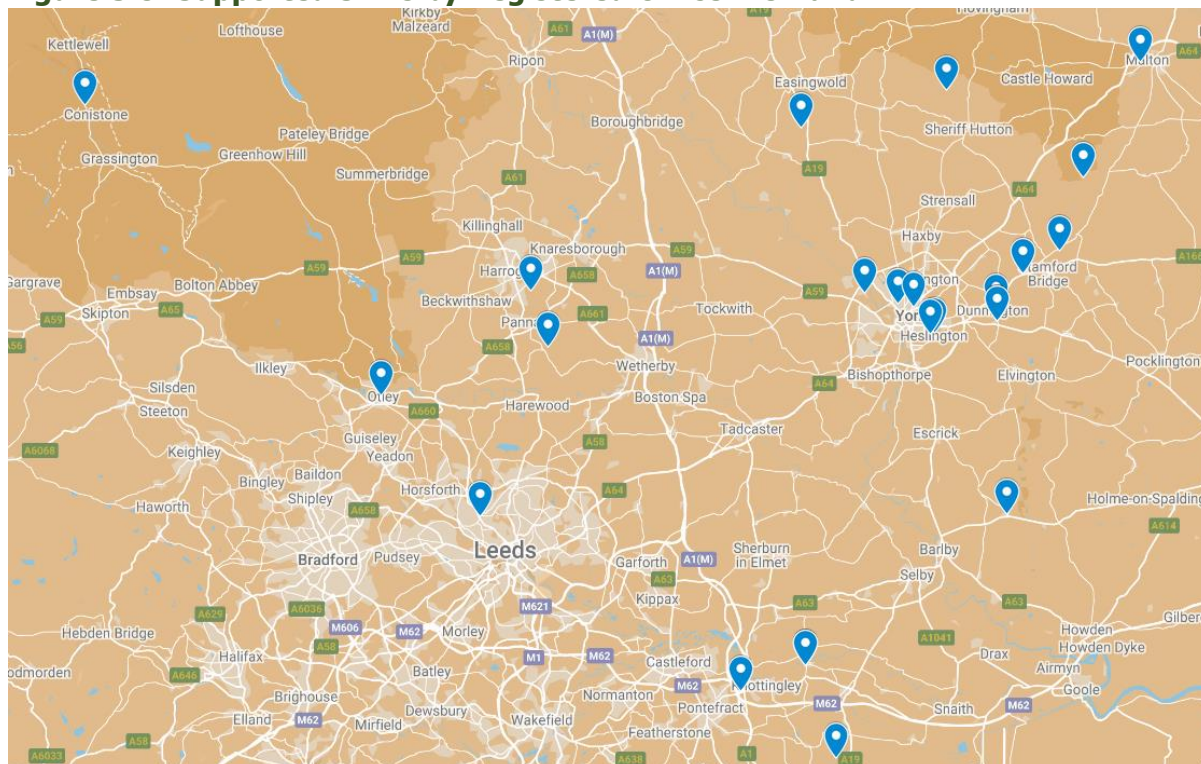
This clearly demonstrates the breadth of engagement delivered through the project, with core project staff and the BDC's and BioVale's networks and reputations playing a role in this process. Indeed, project staff consulted by the evaluation team suggested that the project had encountered few challenges in generating interest and securing SME participation.

The strategic potential of AD and the reputation and relationships of BDC and BioVale clearly helped to ensure that the project was well placed to engage and select the right beneficiaries.

Data provided to the evaluation team provides insight into some of the characteristics of a sample of the SMEs and organisations supported through the project.

Figure 3.8 below provides an overview of the supported SMEs claimed by the projects in terms of registered office, with a significant proportion clustered around York. Overall this shows that the project has successfully engaged SMEs from across both LEP areas.

Figure 3.8: Supported SMEs by Registered Office: LCR and YNY



Analysis of businesses supported by number of employees shows that the project successfully engaged businesses of various sizes, although micro businesses (10 employees or less) accounted for a significant proportion of SMEs claimed as assists. For example, 5% of SMEs had no employees, 38% had 1 employee and 38% had 2 to 10 employees; meaning 81% had 10 employees or less.

Figure 3.9: Employee numbers of Supported SMEs claimed as an Output

No. of employees	% of SMEs
0	5%
1	38%
2 to 5	29%
6 to 10	10%
11 to 24	14%
25 to 49	5%
Total	100%

Analysis of supported SMEs by business sector shows that the project has supported SMEs across a diverse range of sectors, with concentrations of businesses from Professional, Scientific and Technical Services (42% of all SMEs claimed as an output); manufacturing (12%); and Agriculture, Forestry and Fishing (12%); while Water Supply, Sewerage, Waste Management and Remediation activities are also well represented (8%) demonstrating the that the project support businesses involved in all elements of AD related economic activity.

Figure 3.10: Industry of Supported SMEs claimed as an Output

Industry	% of SMEs
Agriculture, Forestry and Fishing	12%
Manufacturing	12%
Energy	4%
Water supply, sewerage, waste management and remediation activities	8%
Construction	8%
Wholesale and retail trade; repair of motor vehicles	0%
Transportation and storage	0%
Information and Communication	4%
Professional, scientific and technical activities	42%
Administrative and support services	4%
Other service activities	8%
Total	100%

Figure 3.11 shows the age profile of SMEs claimed as outputs, with almost half (48%) aged between 2 and 6 years; while almost two thirds (32%) were aged 11 years or over; demonstrating that the project successfully engaged SMEs at various stages in their development.

Figure 3.11: Age of SMEs claimed as outputs

Age of business	% of SMEs
1 year or less	8%
2 to 3 years	36%
4 to 6 years	12%
7 to 10 years	12%
11 to 20 years	16%
21 years+	16%
Total	100%

4. Project Outcomes and Impact

4.1 Outcomes and Impact Achievement

What progress has the project made towards achieving the outcomes and impact set out in its logic model?

To what extent are the changes in relevant impact and outcome indicators attributable to project activities?

The project logic model outlines the intended outcomes and impacts for the project which are shown in **Figure 4.1**, below.

Figure 4.1: Target outcomes and impacts within the Project Logic Model

Intended outcome
To deliver comprehensive feasibility analysis on AD feedstock availability and deployment of commercial AD technologies in YNY and LCR regions
To support regional enterprises in development of innovative products and processes based on anaerobic digestion
To establish a "plug and play" facilitates to scale-up AD-based processes
To develop cluster development activities that build business-to-business and business-to-university interactions to support research, AD innovation and growth of AD sector
To develop a detailed business plan for Circular Malton
Intended Impact
A higher level of innovation of AD- based technologies
A more productive economy in Yorkshire with well-paid, knowledge-based jobs.
Generate new well-paid, highly skilled jobs that will drive the productivity of the region in the bioeconomy sector and increase the competitiveness of the region.

Figures 4.2 provides a summary overview of the project's achievements against its intended outcomes and impacts.

Figure 4.2: Progress against Logic Model Outcomes and Impacts

Intended outcome	Achievements
To deliver comprehensive feasibility analysis on AD feedstock availability and deployment of commercial AD technologies in YNY and LCR regions	This work underpinned all of the project activities. This included research undertaken by the project team to scope the potential of the sector and identify and approach SMEs and organisations that could benefit from ADCEY support, with many of the direct assist provided to beneficiaries also incorporating such comprehensive feasibility analysis.
To support regional enterprises in development of innovative products and processes based on anaerobic digestion	<p>The project directly supported 34 enterprises across the region, the majority of which have been supported to develop innovative AD products and processes or new facilities.</p> <p>Additionally of the 7 beneficiaries consulted by the evaluation team:</p> <ul style="list-style-type: none"> - 5 stated they had benefitted by learning more about AD and CE market and innovation opportunities; - 5 have an ongoing relationship with BDC to take forward AD innovations; - 4 have identified new AD or CE business opportunities they will be taking forward; - 4 have secured new contacts and relationships to support ongoing development of new AD or CE products/processes/services; - 4 have identified a potential new or improved AD or CE product/process/service; and - 1 has launched a new or improved product, process or service
To establish a “plug and play” facilitates to scale-up AD-based processes	While AD equipment was procured to enable this to happen it was not required for any of the assists delivered through the project, any of which utilised existing facilities and equipment. However, the equipment is an important legacy for the project and will be utilised within potential successor projects for ADCEY.
To develop cluster development activities that build business-to-business and business-to-university interactions to support research, AD innovation and growth of AD sector	<p>Again, this has underpinned the entire project with the evidence shown against outcome 2 above and throughout Section 3, demonstrating how the project has supported AD innovation and growth of the AD sector. From a collaboration and interactions perspective the project has developed, supported and brokered numerous positive relationships as discussed in Section 3, above. In addition of the 7 beneficiaries consulted by the evaluation team:</p> <ul style="list-style-type: none"> - 4 have secured new contacts and relationships to support ongoing development of new AD or CE products/processes/services; - 5 have an ongoing collaboration with BDC; - 4 have ongoing collaboration with other businesses; - 2 have increased and ongoing collaboration with other R&D providers. <p>In addition, two SMEs the project worked with have relocated to the region due to the availability of support through BDC and the strength and ongoing development of the AD cluster.</p>

	Overall project activities have enhanced the profile and visibility of AD across Yorkshire, stimulating interest in the sector and relationships and networks with wider bodies such as the AD and Bioresources Association and supporting regional organisations and enterprises to attend sector tradeshow.
To develop a detailed business plan for Circular Malton	This process has been supported throughout the project and has included facilitating a workshop for the Circular Malton group to engage the community and facilitate dialogue and raise awareness around the proposed AD plant which in turn provided important evidence to shape the Business Case that was developed for the project with applications submitted for future further funding to take the proposed development forward.
Intended Impacts	Achievements
A higher level of innovation of AD- based technologies	The project has directly helped to drive innovation within supported enterprises and organisations, as shown by the evidence in this Section and beneficiary quotes throughout Section 3.
A more productive economy in Yorkshire with well-paid, knowledge-based jobs.	The project is supporting a range of AD related innovations which should result in the development of well-paid knowledge based jobs as new products, processes and services are commercialised, enterprises grow and proposed schemes are launched.
Generate new well-paid, highly skilled jobs that will drive the productivity of the region in the bioeconomy sector and increase the competitiveness of the region.	<p>2 of the 7 SMEs consulted by the evaluation team have created or expect to create new jobs over the next 3 years as a direct result of the support received from ADCEY, while 3 expect to increase turnover over the same period.</p> <p>The delivery of this project has helped to drive the development of the AD cluster in the region, while it also plays a key role in the wider activities and interventions delivered by BDC beyond this project which have delivered a strong collective impact for the bioeconomy across Yorkshire which will help enhance the competitiveness of the region.</p>

As supporting SMEs to innovate was one of the underpinning objectives of the project it is important to also consider the degree to which this occurred. In addition to the number of SMEs being supported to develop new products, as identified through ERDF output indicators C28 and C29, the project will also have supported SMEs to progress the development of products and services that are not yet fully realised. In such instances an adapted Technology Readiness Level (TRL) scale enables an assessment of the progress of product innovation supported by the ADCEY project.

Consulted SMEs were therefore also asked to make an assessment on an adapted TRL scale⁵ to enable an assessment of the progress of product, process or service innovation supported through ADCEY.

It should be noted that some respondents found it difficult to attribute an exact shift on the adapted TRL scale, and some were unfamiliar with the approach or it was not directly applicable to the type of support they received from the project (for example, those receiving start-up or market research support). Despite this a total of 4 SMEs were able to provide such insight into the progress of their product or process innovations as a result of support from the project. **Figure 4.3** shows data for these SMEs covering their assessment of their position on the adapted TRL scale before and after support, how far they have progressed since and where their product or process innovation would be without support. This evidence further demonstrates that range of innovation focussed support provided through ADCEY supported SMEs to make considerable progress on their product, service or process innovations; directly as a result of project support.

⁵ http://www.innovationseeds.eu/virtual_library/knowledge/tlr_scale.kl

Figure 4.3: Progression Product/Process/Service Innovations

















Adapted TRL Level	1	2	3	4
1. Exploring - opportunities for new products or processes or improving existing products or processes				
2. Defining - which opportunity is to be taken forward				
3. Investigating – the opportunity and its potential for your business through desk-based investigations				
4. Proof of concept – establishing the opportunity has the potential to work in principle				
5. Bench scale testing and development – the product/process is starting to be tested in a laboratory or research facility				
6. Pilot scale testing - the product/process is undergoing testing at a small to medium scale to demonstrate specific aspects of design				
7. Large scale testing – the product/process is undergoing testing at near full-scale size				
8. Final testing and refinement – testing will be at full-operational scale				
9. Operational – product or process is operational within your business				
10. Commercialisation – the product or process has been launched to market				
 Distance travelled as a result of ADCEY support  Distance travelled following support  Without ADCEY Support				

Figure 4.3 also demonstrates some differences in starting points for supported SMEs when they initially engage with the ADCEY project. Equally the stage to which ADCEY support takes an SME innovation project differs from project to project with some taken to the next stage whereas others made considerable progress through numerous stages. Collectively this evidence provides a good illustration of the degree to which the ADCEY project delivered support tailored the specific needs and circumstances of each individual SME, as well as the breadth of support available.

Clearly supported SMEs have a wide range of experiences and outcomes as a result of their engagement with the ADCEY project. The evidence above demonstrates that some SME innovations make significant progress through the adapted TRL shown above, as a direct result of project support; and others less so. However, it is important to recognise that even where minimal progress appears to have been made the support has often added value:

'The project enabled early stage exploration - if we hadn't of had the support, I doubt we would have even reached an exploration stage.'

This shows that levels of additionality are generally significant. It also important to recognise that creating a culture of innovation within SMEs can be a considerable step, particularly for those without a track record of innovation or moving into a new area of activity, and as such this can be a medium to long term process.

The above evidence shows that the project has made a positive contribution towards its target outcomes and impacts, helping to generate behavioural and attitudinal change and drive product and process innovation and R&D investment within SMEs; while making a significant contribution to the innovation infrastructure within the region.

4.2 Economic, Social and Environmental Benefits

*What are the gross and net additional economic, social and environmental benefits of the project (where relevant and applicable to project activities?)
Can these benefits be quantified and attributed to the project in a statistically robust way?*

4.2.1 Additionality

There are three factors to be considered for the additionality of the project, summarised in **Figure 4.4** below.

Figure 4.4: Additionality Factors

Factor	Additionality
The outcomes/project/innovation would not have gone ahead/been achieved in the absence of project support	Absolute – 100% of outcomes attributable to the project
Participation meant that the outcomes/project/innovation were/was brought to fruition more quickly	Time – a proportion of outcomes attributable to the project (20%)
Participation meant that the outcomes/project/innovation were/was of a higher quality	Quality - a proportion of outcomes attributable to the project (20%)
Participation meant that the outcomes/project/innovation took place at a greater scale	Scale - a proportion of outcomes attributable to the project (20%)

Based on the responses to the survey, the additionality factors for each strand are summarised in **Figure 4.5** below. For example, 57% of those respondents to the survey reported absolute additionality.

Figure 4.5: Attribution of Additionality

Absolute	Quality	Scale
57%	6%	6%

Deadweight within the project is therefore estimated at 31%.

4.2.2 Leakage, Displacement, Substitution

There are three other factors to take into account in calculating net impact on product and labour markets:

- **Leakage:** the proportion of the gross impacts of the project that benefit areas or individuals outside of the intervention's target area (i.e. LCR/YNY);
- **Displacement:** the extent to which an intervention results in economic growth for a beneficiary being offset by reductions in the activities of non-beneficiaries;
- **Substitution:** the behaviour of a beneficiary when one activity is substituted for another solely to take advantage of public sector support.

These are considered in **Figure 4.6**, below.

Figure 4.6: Leakage, Displacement, Substitution

Consideration	Rationale	Yorkshire & Humber	England
Leakage	There is no leakage, as beneficiary firms all came from within the LCR/YNV areas	0%	0%
Displacement	There are limited displacement effects, as the project provided a combination of widely available networking support, supplemented by grant and technical support	5%	0%
Substitution	There is some other support available in the LCR/YNV areas, but it is considered that the substitution effects are minimal.	10%	5%

4.2.3 Gross Direct Effects

28% of consulted SMEs across the two LEP areas have or expect to increase employee numbers and create additional jobs as a result of ADCEY support. This suggests that a total of at least **19** new jobs are expected to be created among beneficiary SMEs.

Figure 4.7 below, shows the sectors (and SIC 2007 Section)⁶ for these firms, and proxy turnover and GVA per head from NOMIS and ONS data for Yorkshire & Humber⁷.

Figure 4.7: Sectors of Beneficiaries

Sectors	GVA per head in Yorkshire & Humber (2021)	% of Beneficiaries
Agriculture, Forestry and Fishing	£6,143	12%
Manufacturing	£61,538	12%
Energy	£375,714	4%
Water supply, sewerage, waste management and remediation activities	£104,550	8%
Construction	£49,167	8%
Information and Communication	£85,012	4%
Professional, scientific and technical activities	£47,875	42%
Administrative and support services	£38,952	4%
Other service activities	£13,642	8%

The total turnover and GVA per head for participating firms are therefore estimated in **Figure 4.8**, assuming even distribution of the gross jobs by sector across the sample.

⁶ https://onsdigital.github.io/dp-classification-tools/standard-industrial-classification/ONS_SIC_hierarchy_view.html

⁷

<https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/datasets/uknonfinancialbusinessconomyannualbusinesssurveyregionalresultssectionsas>
<https://www.nomisweb.co.uk/reports/lmp/gor/2013265921/report.aspx>

Figure 4.8: GVA per sector

Sector	GVA
Agriculture, Forestry and Fishing	£25,063
Manufacturing	£251,075
Energy	£510,971
Water supply, sewerage, waste management and remediation activities	£284,376
Construction	£133,734
Information and Communication	£115,616
Professional, scientific and technical activities	£683,655
Administrative and support services	£52,975
Other service activities	£37,106
TOTAL	£2,094,572

4.2.4 Wider Impact

In order to assess the wider impact of the programme, the **indirect** (through supplier linkages) and **induced** (spend in the wider economy) effects of the economic activity have to be taken into account. While there are no recent multiplier sets that can be used to calculate these effects at the English or Yorkshire and Humber levels, there are Scottish multipliers⁸ that can be used as a proxy. The multipliers that have been used are summarised in **Figure 4.9**, below.

Figure 4.9: Type II Multipliers (2019)

SIC Group	Employment	GVA	% of beneficiaries
Agriculture (01)	1.6	1.9	12%
Other Manufacturing (32)	1.5	1.5	12%
Electricity (35.1)	2.9	1.9	4%
Waste, Remediation, and Management (38 & 39)	2.4	1.7	8%
Construction (41-43)	1.8	1.9	8%
Information Services (63)	1.4	1.4	4%
Other Professional Services (74)	1.4	1.6	42%
Business Support Services (82)	1.3	1.7	12%
TOTAL			100%

Taking into account the sectoral distribution of beneficiaries, the multipliers applied are therefore:

Employment: 1.6;

GVA: 1.7.

Impacts and multipliers are proportioned at 80% YH and 100% English levels within **Figure 4.11**. This shows that the programme is projected to contribute at the English level over the next three years to the creation of:

- **21** net additional FTE jobs;
- **£2.3** million GVA.

⁸ <https://www.gov.scot/publications/input-output-latest/>

Figure 4.11 summarises the net impacts arising from beneficiaries' participation in the ISN project, taking into account additionality, leakage, displacement, substitution and multiplier effects at YH and English levels in terms of:

- Employment, expressed as full-time equivalent (FTE) jobs;
- GVA, an indicator of wealth creation, measuring the contribution to the economy of a specified investment in economic activity.

Figure 4.11: Economic Impacts

		Impact Area 1:		Impact Area 2:	
		England		Yorkshire and Humber	
		Measure	Adjustment	Measure	Adjustment
Impact Indicator: Employment Unit = FTEs	Gross Impact	19.0		15.2	
	Deadweight / reference case	5.9	31%	4.7	31%
	Displacement / substitution	0.0	0	2.3	15%
	Leakage	0.0	0	0.0	0
	Net Additional	21.0	Type II Multiplier 1.6	10.7	Type II Multiplier 1.3
Impact Indicator: GVA Unit = £ms	Gross Impact	2.1		1.7	
	Deadweight / reference case	0.7	31%	0.5	31%
	Displacement / substitution	0.0	0	0.3	15%
	Leakage	0.0	0	0.0	
	Net Additional	2.3	Type II Multiplier 1.7	1.3	Type II Multiplier 1.4

4.2.5 Environmental Impacts

Clearly the support provided to SMEs through the ADCEY project has the potential to have a positive environmental impact given the project's focus on the bioeconomy and the numerous interventions focussed on the reuse or conversion of biological resources and waste.

As part of the beneficiary consultation process, supported SMEs from across the two LEP areas were asked if they or BDC had estimated or measured the actual or potential impacts of ADCEY support on waste and CO2 reduction and to quantify this in tonnes of waste or CO2 reduced. Responses, included:

'AD project expected to save 240,000 tonnes of bio/food waste and 24,000 tonnes of carbon over 20 years. In addition to unlock carbon reduction in many other businesses...Reuse project still to quantify'

'We aim to be carbon negative'

'Yes 199tn CO2e reduction per plasma unit. or 1tn reduction per cow.'

'We will reduce food waste by approximately 20 litres milk per day'

'Potential waste exploitation and associated CO2 reduction should various technologies become fully exploited has been estimated'

Given the ways in which individual responses were provided it has not been possible to provide a cumulative assessment. However, the above examples illustrate the range of positive environmental impacts that the innovation projects delivered through ADCEY have and will continue to have across supported businesses and their supply chains and client networks.

4.3 Strategic Contribution

To what extent has/will the project contribute to the achievement of ERDF programme results indicators?

What are the main sources of Strategic Added Value that the project has created?

The objectives of the project are aligned with a number of national and regional strategic priorities, including innovation and the zero-carbon agenda.

Innovation is central to both LEP's aims for economic growth, with both having a clear ambition to increase the number of innovation active businesses and increase investment in business RD&I through a focus on key strengths and capabilities. The circular economy is also a policy priority forming a key strand of their commitments to sustainability and achieving net zero.

Meeting and balancing what are often seen as the conflicting priorities of economic growth and environmental sustainability, is clearly a huge challenge, as acknowledged by 'Clean Growth' being identified as one of the Grand Challenges in the UK Government's Industrial Strategy. The ADCEY project sits at the heart of this agenda by seeking to support the

growth and development of businesses operating within the bioeconomy who by definition are seeking to enhance environmentally sustainable practices and reduce waste; thereby simultaneously achieving core economic and environmental objectives at national, regional and local levels. The bioeconomy is identified as a strategically significant sector nationally and across Yorkshire, and it is expected to experience continued growth as it seeks to help society and economies adjust to the net zero agenda.

The project was also designed to align with and contribute to a number of regional priorities and those within the ERDF Operational Programme, seeking to address some of the barriers to SME Innovation outlined with the Operational Programme and being clearly aligned to the smart specialisation approach to investment in innovation as outlined within 'Smart Specialisation in England'⁹; which provides the strategic framework for ERDF funded research and innovation investments under the 2014-20 ESIF programme.

The project therefore demonstrated good strategic added value at a regional level through alignment with regional priorities and ambitions in both LEP areas.

It is also important to consider the project in the broader context of the BDC's service offering, including the Bioeconomy Growth Programme (ADCEY), and Bio-Business Park (BBP) ERDF projects; as well as their commercial offering and regional, national and international research projects. Within this context the ADCEY project provided an excellent route for BDC to engage with and support SMEs across a specific element of the bioeconomy, with opportunities for further and potentially ongoing support (where necessary) through other support programmes or to add value to SMEs initially supported through these.

The project also made an important strategic contribution in enhancing the capacity, capabilities and connectivity of businesses operating within the bioeconomy, helping to grow and raise awareness and visibility of AD, CE and the wider bioeconomy cluster both LEPs and Yorkshire as a whole.

The actions of project staff also help to enhance the coherence of what is widely acknowledged as a relatively fragmented and complex innovation support eco-system, particularly from a business perspective, with individual SMEs often referred onwards to other support projects, such as the THYME project¹⁰ and support delivered by other agencies and organisations such as CPI. This is demonstrated by 2 of the 7 consulted SMEs identifying increased and ongoing interaction with other (non-BDC) R&D providers as one of the benefits their business gained from working with the ADCEY project. Indeed, the project being delivered by the BDC in itself also helps to enhance or strengthen the coherence of the innovation support eco-system for the bioeconomy due to its wider delivery role and the presence of the BioVale cluster. The project therefore arguably helped to create a more collaborative and open innovation eco-system and facilitating cross-sector collaboration. This is demonstrated by 5 out of 7 of consulted SMEs highlighting ongoing relationship with the BDC as one of the benefits of engaging with ADCEY.

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/436242/bis-15-310-smart-specialisation-in-england-submission-to-european-commission.pdf

¹⁰ [Thyme – Teesside, Hull and York – Mobilising Bioeconomy Knowledge Exchange \(biovale.org\)](#)

The project will also deliver an ongoing legacy through the enterprises they have supported or enabled to develop and grow as well as its contribution to regional policy and strengthening relationships with investors both inside and outside the region.

The project has demonstrated the positive impact a flexible model of innovation support can have in supporting the development and growth of SMEs and new products/processes/services; increasing their innovation activities and investment; and enhancing the visibility and accessibility of key area of economic opportunity. The activities delivered through this project can provide an ongoing legacy for the Region as the product, service and process innovations supported through this project and the awareness raising and networking that has been facilitated, have the potential to a positive environmental and economic contribution far beyond the funded period of project delivery. In addition, the lessons learned through the delivery of the project can also provide an ongoing legacy by informing emerging regional policy and practice.

Through COVID-19 the project added value to the regional innovation infrastructure, helping to reach out and engage SMEs in the innovation agenda and providing direct support to enable SMEs to innovate and at times pivot their operations at a critical time for the potential viability and sustainability of numerous businesses.

5. Value for Money

Analysis of the value for money that the project has provided and, where possible, benchmarks against other similar interventions

We have used data from the Regeneris Report¹¹, which provides data on other ERDF-supported projects to benchmark projected ADCEY output performance at closure against outcome indicators, supplemented by data from another recent ERDF project SA conducted by our team. These estimates, although incomplete, suggests that the project is forecast to deliver better value for money than the Regeneris benchmark values against most indicators and provides better value for money than the comparator project.

In the case of employment increase, it should be noted that the net additional jobs projected at the English level over three years is 21, deriving a total project cost per net additional full time equivalent job of **£46,781**.

Figure 5.1: Value for Money

ERDF Indicator	Total ERDF Cost Against Output		
	ADCEY	Other 2014-20 ERDF project	Regeneris ERDF Project Mean
(C1) Number of enterprises receiving support	£14,447	£25,291	£34,000
(C5) Number of new enterprises supported	TBC	£230,151	£116,000
(C26) Number of enterprises co-operating with research entities	TBC	£47,948	£93,000
(C29) Number of enterprises supported to introduce new to the firm products	TBC	£109,596	£94,000

¹¹ Regeneris (2013) England ERDF Programme 2014:20 Output Unit Costs and Definitions <http://www.nwueu.ac.uk/NWUEU/PDFs/Regeneris%20Consulting%20-%20ERDF%20Output%20Note%20FINAL%20Version%2018%2012%2013.pdf>

6. Conclusions and Lessons Learned

Please provide a brief description of the strengths and weaknesses of the project. Please use quantitative data to illustrate your conclusions (e.g. of financials and outputs, of outcomes and impacts etc)

6.1 Project Strengths

The ADCEY project aimed to provide direct innovation support to SMEs while also enhancing and facilitating the greater integration of the regional innovation infrastructure. Consultation and analysis has revealed that the project had a positive impact at both individual firm and strategic levels, supporting the growth and development of SMEs and while helping to strengthen regional innovation support infrastructure and capacity for the bioeconomy, a key priority across the wider Yorkshire & Humber region. Cutting across both the strategic and firm level work of the projects is the ADCEY and the projects key roles as innovation animators in the region, raising awareness, building and facilitating connections and collaboration, enhancing investment and ultimately increasing innovation activity. Here it is important to recognise the collective impact of the suite of publicly funded support programmes and the commercial offer available through the BDC and its wider developmental role as delivered through BioVale.

While the support provided to individual product, process or service innovations through ADCEY are arguably and in the main part of a longer process; there is clear evidence of the positive impact these activities have had in these areas as highlighted throughout this report. One of the core strengths of the projects is the fact that they can provide support across the various parts of or the whole innovation journey from simulating idea generation to product and service development and commercialisation, with SMEs able to access any element of that support that is appropriate to them. They thereby enable a wide range of SMEs to benefit in a variety of different ways.

As consequence the project has successfully:

- Enhanced innovation related awareness and understanding, by:
 - Raising awareness of AD innovation approaches and opportunities among SMEs through one-to-one support and events;
 - Raising the profile of AD across the region;
- Increased innovation activity to drive growth, by:
 - Product, service or process development or improvement taken forward by SMEs as a result of direct support provided by the project through one to one support and other activities;
 - Improved business and innovation strategy, with consulted businesses stating they have enhanced these as a direct result of engaging with the project;
- Enhanced investment in innovation, by:
 - Increased SME investment in innovation as evidenced by the survey responses discussed in Section 4, above;

- Facilitated collaboration, by:
 - Generating contacts and relationships leading to potential new business opportunities, collaboration or investment, either by direct introduction or facilitated through cluster focused events.

Key strengths that have enabled the project to do so are summarised below.

6.1.1 Delivery Partners Reputations and Networks

Through the delivery of previous bioeconomy focussed ERDF funded projects and their wider research and commercial work the BDC brand is well known by SMEs, support agencies and organisations and key corporates, alike. In addition, the work of BioVale as regional cluster organisation for the bioeconomy only adds to this with the extensive networks and relationships they have developed through their activities and events. Also, many of the staff involved in delivering the project have worked at BDC or BioVale for a number of years and therefore have extensive relevant relationships and networks across business and the wider support eco-system.

The collective profile, extensive networks and strong relationships with policymakers and among the relevant business community of BDC and BioVale therefore helped the project to attract participants and link them into other networks or relationships and this clearly added significant value to the projects, with stakeholder consultations suggesting the projects have not encountered any difficulties in obtaining participant target numbers. The importance of these networks is evidenced by the fact that a significant proportion of supported SMEs consulted by the evaluation team either had a previous or ongoing relationship with BDC.

6.1.2 Diversity and depth of expertise and facilities

It is important to recognise the integral role that individuals play in the effective delivery of a project. While facilities, delivery structures, activities and roles can be well designed their success or otherwise is dependent on the individuals who fill those roles and deliver the activities. Consultation with supported SMEs and project delivery staff has demonstrated the importance of the personnel managing and delivering the project with many highlighting these as a key strength. This shows that the project benefitted from having the right people in the right posts with the skills, knowledge and capabilities required with the project overall providing an effective blend of strategic, sector, start-up, business development, innovation and technical expertise.

The facilities at the BDC and the range of personnel available to support SMEs through the project, as shown in **Figure 3.1** above, clearly demonstrates that the project was able to provide SMEs with access to a diverse range of specialist skills and equipment that would be out of reach for the vast majority of SMEs due to the costs and expertise required:

'As a new small business we have multiple tasks to achieve with a small team so accessing this support was vital in enabling us to examine new potential sources of revenue generation. Without help, we wouldn't have had the resources to make this happen.'

This clearly demonstrates the degree to which the project opens up innovation opportunities to businesses that would not otherwise be able to do so.

Importantly a significant proportion of the businesses consulted by the evaluation team highlighted the individual project team members they worked with as one of the key strengths of the project. In particular they highlighted the degree to which they sought to understand them and their business and tailor their support to their needs. Indeed, the fact that many SMEs have previously received support from the BDC demonstrates how much they value their ongoing relationships with these staff and how they view these relationships as important to the ongoing development of their business and innovations. This clearly demonstrates the importance of the individuals employed by the project as well as true responsiveness to SME needs and the ongoing role it and its staff play in supporting businesses, beyond the minimum support thresholds for ERDF outputs.

Involvement in a diverse range of innovation projects across AD also benefits the BDC; providing staff with exposure to a wide range of different industries, sectors and projects which is hugely beneficial to the ongoing CPD of BDC team members and the organisation's expertise and service offering.

6.1.3 Delivery Team Integration

As outlined above the project is able to offer a wide range of support to SMEs with a wide range of BDC and BioVale staff providing direct assists to businesses. Additionally, the BDC has implemented a number of approaches to ensure effective cross-team working, including weekly pipeline meetings to review existing and emerging SME support projects.

6.1.4 Scale

The scale of support interventions is another key strength of the project, with ERDF funding enabling the BDC to support SMEs who would not warrant a research project and could not afford commercial support to access support to help them innovate, giving them capacity and capabilities, they could not otherwise access.

The BDC project was particularly well placed within the wider BDC offer and support ecosystem providing specialist more intensive support in a specific area of the bioeconomy, which supported the wider support offer through other projects.

6.1.5 Outcome and Outcomes Focussed

While the time allocated to business assists is well defined the ADCEY project sought to ensure the support is targeted effectively to try and ensure that supported SMEs are provided with something tangible and meaningful from the support provided, enabling them to progress as a business or for their innovations to progress. The customer journey from diagnostic to a well-defined project scope through to delivery of support and the production of a focused report outlining findings, recommendations and next steps helps to ensure this.

6.1.6 Efficiency

Processes for BDC delivered ERDF projects have been refined over a number of years and as such the process is relatively straightforward for the SME and members of the project delivery team, with well-established and understood information collection and monitoring

processes to ensure compliance. From an SME perspective they essentially are required to engage with the ACEY team and complete the forms. Consequently, participants are given a tight project scope to ensure all participants are aware of what will be delivered as part of the assist with staff ensuring that the inputs required are appropriate to the allocated time to a business assist through the ADCEY project.

6.1.7 Depth and Breadth of Eligible SMEs

Focusing on the AD sector as a whole means the projects can support SMEs engaged in a wide range of economic activities and the development or potential development or application of products/services/process from across the supply and demand sides. This enables them to target businesses who are or have the potential to be innovation and research driven.

This enables them to work with companies that are start-ups or in the early stages of development to others that are well established within AD, so they can help existing businesses pivot their operations and address latent demand for support by providing support to enable businesses to move into the bioeconomy when they didn't know they could. The project was also able to support businesses at any stage of their innovation journey.

6.1.8 Strategic Alignment

Alignment with the broader policy context and the innovation infrastructure has played an important role within the project. Effective integration ensures the project had a strong understanding of, is shaped by and helps to connect the wider innovation offer available to SMEs. There is extensive evidence of SMEs being supported to engage with other innovation support available across the region from that offered by Universities to other providers, including other ERDF projects.

From the outset the project sought to ensure it were stimulating innovation to support regional priorities by focusing on developing a cluster and supporting SMEs within a key priority and opportunity for the regional economy.

The project also made a positive contribution towards the target outcomes and longer-term impacts as outlined in **Section 4.1** above. **Section 4.2** of the report also demonstrated the positive economic benefits generated through project activities.

Evidence collected from beneficiaries shows they largely valued support provided by the project with evidence also showing the positive impact the projects have had on established and new enterprises supported through the project.

6.1.9 Sustaining Delivery

It is important to acknowledge the importance of the project adapting and sustaining delivery and achievement of outputs throughout various lockdowns and social distancing restrictions throughout the COVID-19 pandemic. The evaluation team are aware of other ERDF business support projects that either suspended delivery; or stopped delivery and brought their project to an early closure; or struggled to engage and support SMEs and achieve their output targets. To adapt and sustain delivery while maintaining the quality of

support and quantity of support outputs highlights the commitment of the BDC and its staff and is clearly a key strength of the project.

6.2 Weaknesses

The project was built on 12 years or more of experience of delivering ERDF projects and as such there are no notable weaknesses. However, as with any project the BDC has encountered some minor challenges in delivering ADCEY, although processes are in place to ensure such challenges are reflected on and action taken to address these.

Understandably the COVID-19 pandemic had a significant impact on some of the marketing and events focussed elements of the project, however, this cannot be described as a weakness.

Importantly, as the project was designed to have a broad scope and be able to be accessed by a wide range of businesses it was largely felt that the project has the ability to support all those it could or needs to. Additionally, the extensive and ongoing experience of the BDC in delivering ERDF programmes focussed on innovation within the bioeconomy or elements of it means they have refined and streamlined their monitoring, claims and information collection processes.

Staff consulted by the project therefore suggest no significant weaknesses with the exception of ERDF bureaucracy. However, challenges identified by delivery staff and the evaluation team, include:

- External governance provided through the managing authority could be slow;
- SME capacity with some SMEs struggling to have the time to fully participate;
- The issue of latent demand with some businesses who could benefit from bioeconomy focussed support not necessarily knowing they are or could be part of the bioeconomy;
- Managing expectations with some businesses having unrealistic expectations on what can be achieved through a 2 day assist but processes are in place to effectively manage this, with the project scope for any assist tightly defined and clearly explained;
- The scale of support. ERDF target outputs and their associated definitions (a minimum of 12 hours of support to be registered as an eligible assist) inevitably result in a tightly defined timescale for delivering project support to SMEs, with 2 days allocated through the ADCEY project. At least one member of staff suggested this can create a relatively challenging delivery timescale for laboratory-based work and as such lab-based assists can often exceed the allocated time, although all acknowledge that the BDC has got better at not over-delivering. While this is not a weakness it does result in a balance having to be struck between those projects that require more than the 2-day allocation and those that can be done within this timescale;
- While the CRM system has helped to ensure the project was administered and managed efficiently there are inevitably always minor improvements or refinements that could be made, although such changes are unlikely to have no major impact and would effectively be *'tinkering around the fringes'*. Examples include, enabling the

CRM system to assist in capturing output evidence particularly in relation to jobs created and new products/processes or services created;

6.3 Lessons Learned for BDC and partners

Delivery of the ADCEY project reinforced a number of lessons that BDC have learned in delivery a number of ERDF projects over a significant period of time. These lessons form the basis the strengths and weaknesses outlined above.

BDC and individual staff have also developed their organisational capacity and capabilities and expertise through delivery of these projects.

6.4 Lessons for Other Stakeholders

6.4.1 Lessons for those designing and implementing similar interventions

Clearly the experience of delivering this project and the evaluation or summative assessment process itself have revealed a number of potentially important lessons for organisations who are seeking to design and implement similar interventions, many of which directly relate to the strengths and weaknesses and subsequent lessons outlined in **Sections 6.1 to 6.3**, all of which are outlined above. This includes:

- Utilising existing organisations to develop and implement innovation capacity and capabilities within sectors. The expertise, understanding and networks provided are essential for creating pathways for SMEs to engage and networks providing ongoing development opportunities for businesses and their innovations;
- The need to ensure sufficient organisational capacity and capabilities are in place from the outset and sustained throughout delivery to ensure project momentum is sustained, outputs are captured and all components are delivered effectively and within an appropriate timeframe. This includes comprehensive project planning, robust data capture and monitoring process and effective marketing budgets and activity;
- Relationship management and the skills and capabilities of individual staff members are key;
- The value of cross-team working facilitated through regular and clear communication pathways between all project delivery staff;
- The need to work closely with the Funding Project Officer to initiate dialogue around potential change requests and variations at an early stage in the process.

6.4.2 Lessons for Policy Makers

Lessons learned for policy makers build on the strengths, weakness and lessons discussed above. Further lessons are outlined below.

An important lesson for policy makers to learn from the experiences of the project is the importance of animation to driving innovation and supporting the growth and development of an emerging economy such as the bioeconomy. Innovation will not occur in a vacuum it requires dedicated resources to broker relationships, foster and facilitate connections; identify opportunities; help SMEs to understand how to secure investment; provide accessible pathways to potential investors; and provide support to pump prime product,

service or process innovation or increase its scope or scale. This is particularly true where businesses may not be aware of their potential within the bioeconomy.

It has also demonstrated the value of a cluster-based approach. The innovation landscape is unnecessarily complex both across the UK and within its regions, particularly for SMEs. Funding a range of support programmes through a key support agency and cluster organisation such as the BDC and BioVale enhances connectivity within the innovation ecosystem, providing pathway for SME involvement in a wide range of innovation support activities and working with other partners to deliver.

Closely aligned to the challenge outlined in relation to 'scale of support' above is the potential need for a more nuanced approach to output definitions. In the case of innovation projects such as ADCEY, no two business assist are the same and as such the level of intensity and inputs required can differ. Consequently, there is potentially a need to have differing levels of assist beyond those included within existing ERDF definitions, to acknowledge the intensity of support provided to some businesses to progress their product/process/service innovation.

Another lesson relates to gathering data on jobs created which is clearly a challenge for innovation focussed projects which involve relatively small-scale interventions (from a time input/cost perspective) where any jobs created are anticipated to be over the medium to longer term.

From a funders perspective it is important that any retrospective implementation of changes to evidence requirements are kept to an absolute minimum. For example, during delivery of the project there were adjustments to the data the project was required to gather for the summative assessment monitoring template and the projects had to go back to businesses to ask them for further information in relation to R&D expenditure and previous product/service/process innovation.