OxFutures

Summative Evaluation Report

SAM HAMPTON | SUSTAINABILITY CONSULTANT

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European Union
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Executive Summary

Running from 2017 to 2023, OxFutures aimed to boost low carbon economic development in Oxfordshire. Funded in part by the European Regional Development Fund (ERDF), it consisted of four separate workstreams, each focused on unlocking the potential of SMEs to drive sustainable growth and climate action.

Methodology

This Summative Assessment draws on a range of empirical research, including surveys and interviews with SME beneficiaries, interviews with the project team and other stakeholders, and documentary analysis. It assesses project progress against financial targets and key performance indicators, and evaluates value for money for each major workstream.

Context

The project spanned a tumultuous five year period in which public concern for climate change grew significantly, COVID-19 caused unprecedented disruption to business as usual, and the Russian invasion of Ukraine led to an energy price crisis across Europe. The OxFutures team steered the course through these challenges, meeting project objectives and achieving tangible impacts.

Project Targets

All key targets are on track to be met by the end of the project timeline:

Indicator	Target	Progress (Nov 22)
SMEs supported with energy audits (C1)	181	174
SMEs receiving 12 hours of support (C1f)	39	35
New enterprises created as a result of support (C5)	7	7
Enterprises cooperating with research entities	2	2
SMEs supported to create new product or service	8	8
CO_2e savings from efficiency audits and grants (C34b)	896	742
CO_2e savings from Greenfund Innovation grants (C34f)	444	277

Workstreams

Greenlab

OxFutures Greenlab had three overall aims:

1. Produce a smart energy supply and demand model for Oxfordshire.
2. Develop the business case for demonstrating how to integrate renewable energy into specific urban and rural locations, leading to at least one new Community Energy Service Company.
3. Boost knowledge transfer between universities and SMEs.

All activities were completed in the first phase of OxFutures (ending 2020), during which these aims were met and exceeded. 14 knowledge exchange workshops brought businesses together with local authorities and the research community, while collaborations initiated by OxFutures led to the development of Project LEO: a national energy innovation demonstrator. Within OxFutures, urban and rural demonstrators featured a range of activity, including feasibility studies for the development of low temperature waste-heat networks, and local energy mapping for retrofit. The project also supported the sister project 'Go Ultra Low Oxford' which deployed on-street electric charging infrastructure in Oxford to overcome the barrier to uptake faced by many residents without off-street parking.

Oxfordshire Greentech

Oxfordshire Greentech is a business network which supports and represents the interests of low-carbon businesses across Oxfordshire. It was supported during OxFutures Phase 1 to launch, becoming independent of the project in 2020.

The network represents excellent value for money, having recruited 90 members in its first year, and providing a broad range of activities and services. It has maintained its membership since losing ERDF funding and through the pandemic, and has

benefitted from strong links with Cambridgeshire Cleantech. Besides its membership fees, it generates revenue by providing consultancy services and hosting events.

Greenfund Innovation

The OxFutures Greenfund Innovation Programme aims to overcome market barriers facing eco-entrepreneurs. Feasibility grants were available to SMEs to support the early-stage development of low carbon goods and services, valued at up to £25,000 (50% of eligible costs). Those having completed feasibility projects could go on to apply for a further £25,000 from an implementation grant, worth 25% of project costs. 12 SMEs were supported to bring products and services to market, ranging from an artificial intelligence system used to switch off heating in unoccupied rooms, to the development of an electric narrowboat.

Energy Audits and Grants

Over 180 SMEs were provided with a free energy efficiency audit, conducted by experts from Oxford Brookes' Environment Information Exchange. A total of 1170 individual recommendations were made, amounting to an average annual energy saving of over 31,000kWh per SME, if implemented in full. 62 of these organisations went on to receive match-funded grants to support the implementation of audit recommendations. The most popular measures taken were the installation of LED lighting, improved glazing, and building insulation. Other businesses were supported to install solar panels, electric vehicle chargers, and energy management systems. Counter-factual analysis indicates that the audits and grants provided additionality and value for money for SMEs in Oxfordshire.

Conclusions

OxFutures was an exemplary ERDF Priority Axis 4 project, meeting its original objectives and performing well against targets. It directly led to several other projects and initiatives relating to Oxfordshire's energy transition, and can boast a strong legacy.

Introduction

OxFutures aimed to boost low carbon economic development in Oxfordshire. Supported with over 2.1m of ERDF money, the project began in April 2017, with an initial end date of March 2020. Several workstreams were then extended to March 2023.[1]

Its main objectives were to support SMEs in Oxfordshire to: (1) become innovation active in the low carbon sector, (2) develop new low carbon products and services, and (3) become more energy efficient.

Evaluation Methodology

This Summative Assessment provides an evaluation of the OxFutures over its full lifetime. It builds on the Interim Summative Assessment, published in May 2020, which analysed the first phase of the project. The objectives of this Summative Assessment are to assess:

- The continued relevance and necessity for the project, given widespread economic and social change
- Progress against contractual targets
- The success of project management and implementation approaches
- Impact on SME beneficiaries and Oxfordshire's wider energy transition
- Additionality and value for money

This Summative Assessment uses mixed methods to evaluate the success of Oxfutures. Desk-based analysis of secondary data focuses on the wider economic, social and environmental context in the period 2017-22. Secondary data is also used to analyse the distribution and reach of SME beneficiaries when compared to the wider SME community in Oxfordshire.

Primary data collection for this evaluation includes surveys and interviews with SME beneficiaries, the project team, and OxFutures Advisory Board members. The methodology for assessing additionality and value for money are informed by Green Book principles, and include counter-factual analysis using a survey of SMEs not receiving ERDF support, as well as trends in the uptake of energy efficiency measures by SMEs, using third party national surveys. The evaluation also adopts a theory-based approach which is based on the definition of market-failures set out at project inception, as well as the project Logic Model.

Project Partners

Low Carbon Hub was lead partner, overseeing all work packages and seeking to deliver a smart, sustainable energy transition in Oxfordshire.

Bioregional is a charity creating sustainable living environments. It led the Oxfordshire Greentech workstream.

Oxford City Council is a leader in sustainability, and was involved in the Greentech workstream

Oxford Brookes' led the energy efficiency audits workstream. Brookes researchers were also involved in Greenlab.

CDC supported Oxfordshire Greentech, Greenfund and Greenlab workstreams.

Oxford University were involved in the Greenlab workstream.

[1] OxFutures is officially registered as 'Growing Oxfordshire's Low Carbon Economy' with the ERDF.

Part 1 - Project context analysis

Project Context at Inception

Global and National

At the time of writing the proposal for OxFutures funding, the Paris Climate Agreement had been recently implemented by members of the UNFCCC, with new ambition to limit global warming to 2C°, and aim for 1.5C°.

At the same time, reliable evidence was emerging about the untapped opportunities for energy and emissions savings amongst small- and medium-sized enterprises (SMEs), including through energy efficiency measures, and the adoption of smart technologies.

In response, the UK Operational Programme for ERDF 2014-2020 dedicated its Priority Axis 4 to 'Supporting the Shift Towards a Low Carbon Economy in All Sectors", including the following priorities:

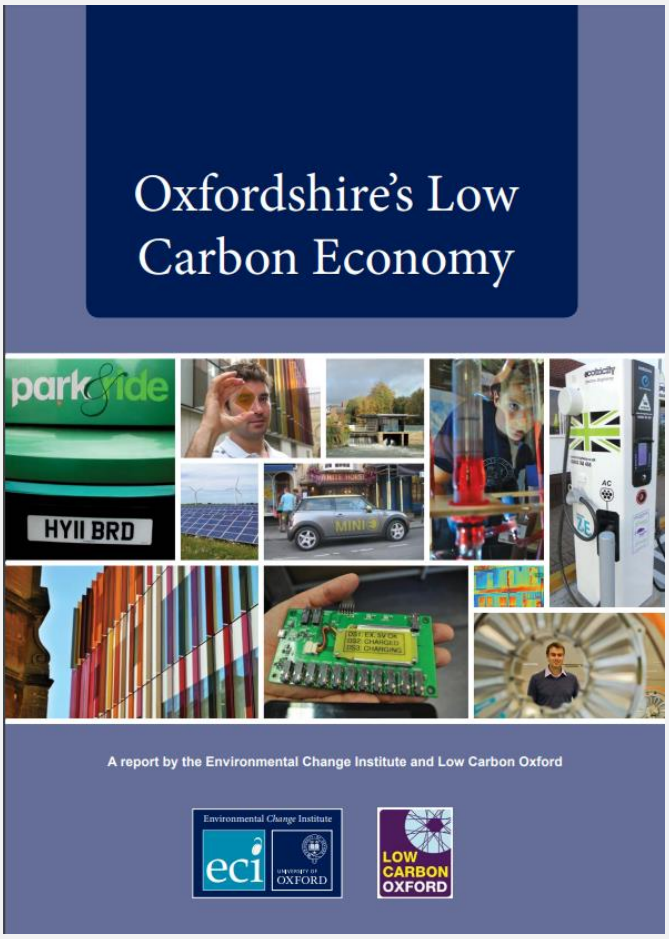
- Energy performance improvements
- Innovation in low carbon products and processes with research & development
- Adopting renewable and low carbon fuels for energy consumption
- Adopting low carbon technologies

Local context

The Oxfordshire Low Carbon Economy report (2014) highlighted the strengths of the low-carbon goods and environmental services sector in the county, employing more than 8,000 people and representing 7% of Oxfordshire's economy.

However, there remained a high dependence on fossil fuels for transport and heating, and many areas of the county remained off-gas, while the electricity grid was constrained in many places, hindering the deployment of renewable energy generation.

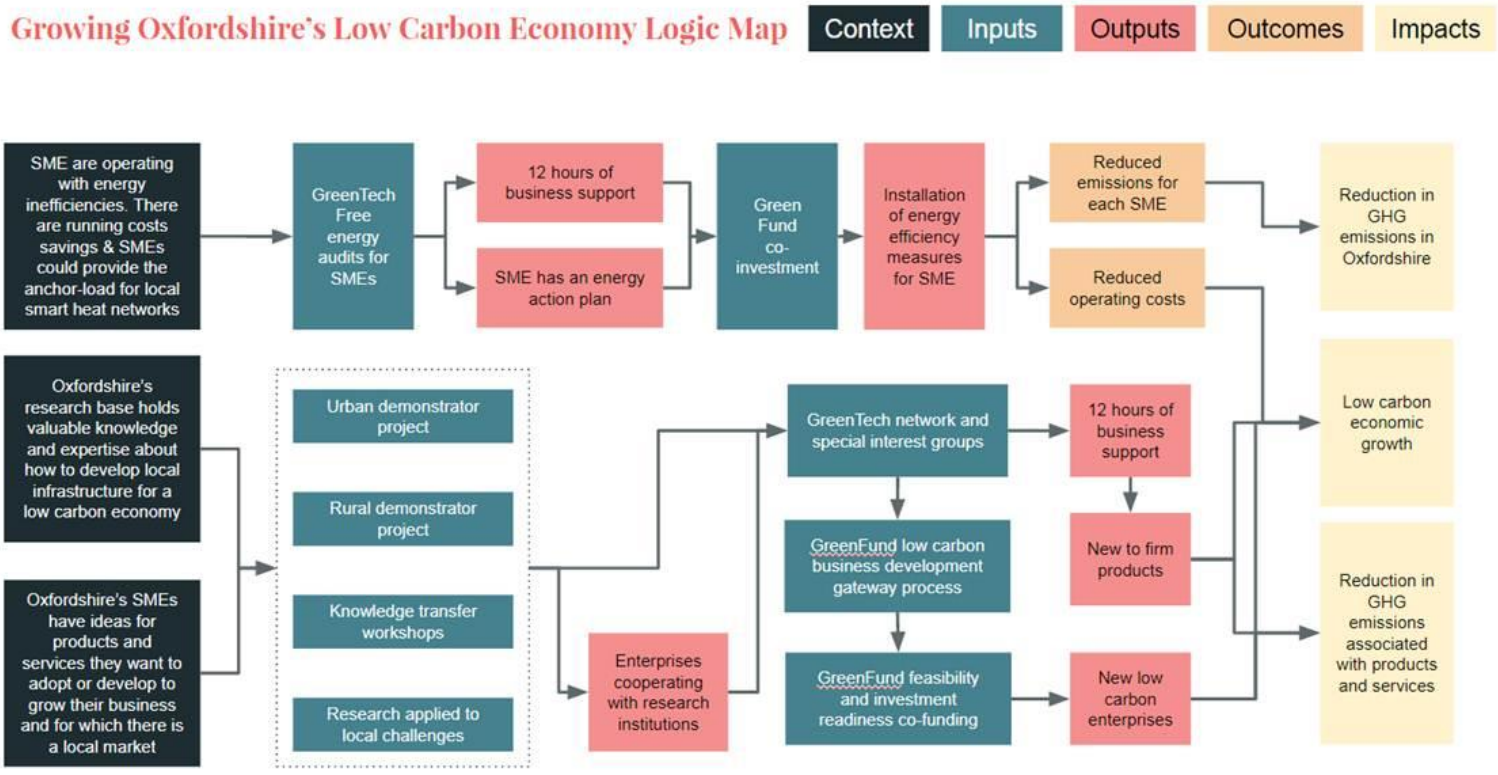
It was recognised that low carbon technologies and business models represented significant businesses opportunities for SMEs and start-ups in Oxfordshire, including in new digital technologies, electric vehicles, energy storage and smart grids.



The Low Carbon Economy report (2014) was influential, drawing attention to the potential of clean growth. The Pathways to a Zero Carbon Oxfordshire report (2021) builds on this evidence base.

OxLEP's ESIF strategy identified several priorities which would help to address the challenges faced by SMEs. These included:

- Supporting SMEs to take-up energy efficiency opportunities
- Creating a network for innovation driven businesses in the low carbon sector, offering business advice, management training and skills provision and development
- Developing and demonstrating smart technologies such as grid management, and smart metering
- Clustering different low carbon initiatives for cross fertilisation of ideas



Project Rationale

Responding to global trends, national ERDF priorities, and the principles outlined in OxLEP's ESIF strategy, the OxFutures bid document presented the case for public investment by setting out three distinct market failures preventing SMEs from benefitting in full from the energy transition:

1. The strengths of research base and expertise is not being capitalised upon;
2. SMEs are struggling to develop and commercialise low carbon solutions due to concerns over exclusivity and knowledge-sharing, and uneven access to information.
3. Oxfordshire's SMEs are failing to take-up cost effective energy efficiency opportunities;

Seeking to overcome these failures, OxFutures proposed a suite of interventions to support 165 SMEs to (1) become innovation active in the low carbon sector, (2) develop new low carbon products and services, and (3) become more energy efficient.

These interventions - labelled as 'inputs' in the project Logic Model – can be grouped into four categories. The first three sets of activities address market failures 1 and 2, and the final activity addressed market failure 3.

Greenlab aimed to address the market failures relating to SMEs' ability to access and capitalise on world-class knowledge and expertise, and to develop low carbon solutions. Knowledge transfer workshops, the rural and urban demonstrators, and the development of a smart energy supply and demand model for Oxfordshire were the main activities which would overcome these issues.

Greentech also addressed market failures 1 and 2, by convening a peer network of SMEs involved in Oxfordshire's low carbon economy, and providing access to opportunities including networking, expert-workshops, and special interest groups.

Greenfund innovation provided match-funded grants to eco-innovators Oxfordshire to help them overcome financial barriers to commercialising new low-carbon goods and services.

Energy efficiency audits and grants directly addressed the persistent low-uptake of energy efficiency measures by tackling two key barriers: access to information and technical knowledge about energy saving opportunities; and the affordability of measures. OxFutures provided expert assessments of building fabric, process energy and opportunities for renewable generation; and offered match-funded grants for SMEs to undertake recommendations.

Part 3 of this report evaluates each of these interventions in turn.

Project Objectives

The initial funding for OxFutures spanned April 2017 to March 2020. The first phase of the project had the following objectives and indicators:

Indicator	Target
SMEs supported with energy audits (C1)	136
SMEs receiving 12 hours of support (C1f)	29
New enterprises created as a result of support (C5)	5
Number of enterprises cooperating with research entities (C26)	2
SMEs supported to create new product or service (C29)	4
CO2e savings from efficiency audits and grants (C34b)	665
CO2e savings from Greenfund Innovation grants (C34f)	375

The project was then granted an extension to March 2023 and awarded additional funding. Its objectives were updated at this time:

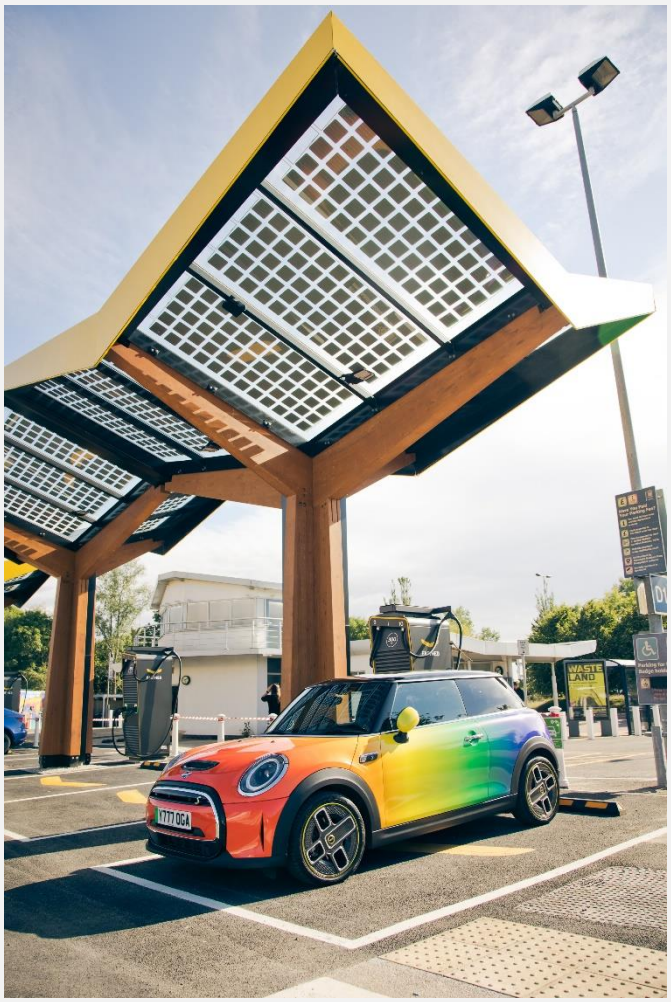
Indicator	New Target
SMEs supported with energy audits (C1)	181
SMEs receiving 12 hours of support (C1f)	39
New enterprises created as a result of support (C5)	7
Number of enterprises cooperating with research entities (C26)	2
SMEs supported to create new product or service (C29)	8
CO2e savings from efficiency audits and grants (C34b)	896
CO2e savings from Greenfund Innovation grants (C34f)	444

It should be noted that not all activities were included in the project extension. Oxfordshire Greentech, and the GreenLab, were excluded from the second phase of the project. This was because the network had already been helped to successfully launch, and the GreenLab activities had been leveraged to attract investment through the inception of Project LEO.

Changing Context

Since OxFutures was funded in 2017, concern for climate change has been growing amongst the UK public, and national and local governments have stepped up their ambitions for reducing emissions. Over 300 local authorities have declared climate emergencies, while the UK government has passed legislation binding the UK to achieving net-zero by 2050. Although SMEs remain somewhat neglected by energy and climate policy, activity on decarbonisation is growing, and new initiatives such as the SME Climate Hub and Race to Zero have been supported by a range of industry and government stakeholders.

In Oxfordshire, all six local authorities declared climate emergencies, and in 2020, commissioned the Pathways to a Zero Carbon Oxfordshire report, which set out the scale of change needed to achieve net-zero in the county. The county continues to be a



Energy Superhub Oxford features Europe's most powerful EV charging hub (Photo: EDF Renewables UK)

leader in many aspects of climate action, and projects such as Energy Superhub Oxford, Project LEO and Go Ultra Low Oxford are trialling market-leading innovations in the county. SMEs are at the heart of the innovation ecosystem. For example, Oxford University has now spun out over 200 businesses, more than any other UK university.

However, the last few years have also delivered a set of unprecedented challenges to SMEs. Most notably, COVID-19 and the associated lockdowns led many businesses to close temporarily or permanently, affecting the hospitality and tourism industries worst. However, those in the 'knowledge economy' performed better, and the number of businesses registered by the end of 2020 actually *increased by 6.1%* compared with 2019. It is unclear whether this this is a positive or negative trend however, as many new businesses were created by those made redundant during the pandemic as a result of business closures. In any case, the pandemic has certainly led to a major restructuring of the economy, with a greater proportion of people working from home and shopping online. Empty shops and commercial properties can be seen across High Streets in Oxfordshire.

In 2022, the cost-of-living crisis is also severely affecting SMEs, with drastic increases in the price of energy, food and raw materials. Whereas households are protected (to an extent) by the Energy Price Cap, there is no cap on SME energy bills, and businesses are being forced to pass on costs to their customers, where they are able.

Supply-chains have not yet recovered from disruption caused by the pandemic, Brexit, and the war in Ukraine Meanwhile, there is a significant shortage of labour nationwide, and Oxfordshire SMEs are struggling to recruit suitable workers. There is pressure to increase wages, further increasing the cost of trading.

These changes have dramatically affected the practical delivery of OxFutures' workstreams, and this is explored in detail in Part 3. On the one hand, there is clear evidence of increased desire amongst SMEs to take climate action. This includes installing energy efficiency measures, electric vehicle chargers, sourcing sustainable inputs, and making public

Many retail and hospitality businesses have not reopened after the pandemic

Hallidays Hydropower were awarded an OxFutures grant to develop an app that would give wireless control over the hydropower installations in order to move manually operated sites to automatic operation and reduce hydro downtime

statements about their green ambitions. The home-working trend has led many businesses to down-size premises, and we know that moving premises is a key window of opportunity for making energy efficiency improvements. As shown in Part 3, demand for OxFutures' energy audits remains high, and the team were even able to carry out some assessments remotely during lockdowns. On the other hand, many are struggling to survive in the current economic climate, and are having to deprioritise capital investments. While OxFutures audit reports have been widely welcomed, the translation of recommendations into actions has been slower than hoped.

Overall however, despite the economic and social transformations which have occurred over the last 5 years, the market failures identified in the OxFutures persist. There continues to be an urgent need for more energy efficiency measures taken in non-domestic buildings across Oxfordshire; for knowledge-exchange to accelerate low carbon innovation; and for support for businesses to develop and commercialise low carbon products and services.

Part 2 - Overall Project Progress

Overall, OxFutures has performed well against its original objectives. It has involved a wide scope of workstreams, some of which exceeded those ERDF activities typically funded under Priority Axis 4. This sets out OxFutures as a nationally exemplary project, having helped to leverage low carbon growth in Oxfordshire. Examples of this include Greenlab activities, which led to further investment in low carbon innovation such as Project LEO, and the Clean Heat Streets project; and Oxfordshire Greentech, which has established itself as a financially sustainable green business network, and as a leading voice for the low carbon sector. The Greentech team, for instance, wrote the Innovation chapter of the influential Pathways to a Zero Carbon Oxfordshire report.

Targets and indicators

OxFutures is working towards several targets set by its government funders. Progress towards meeting these targets is shown in the table overleaf.

Changes in scope

There has been one Project Change Request (PCR) during the course of OxFutures. This involved additional funding of £1,070,000, and an extension to March 2023. The extension was justified on the basis of strong progress and impacts achieved up to 2020, including the £80m investment in clean energy innovation from the Prospering From the Energy Revolution programme. The PCR also cited the publication of the Oxfordshire Energy Strategy in 2018, which called for: a) more ambitious and innovative clean generation projects; and b) reductions in energy demand across buildings and transport.

Project targets were increased in line with the new ERDF investment (see table below).

Communications and Dissemination

OxFutures benefits from the prominence of the Low Carbon Hub in Oxfordshire, which has a reputation as the principal civil-society organisation leading climate action in the county. Nonetheless, OxFutures has established its own branding and reputation, and has issued a regular newsletter with project updates, case studies, advice and guidance for SMEs, and events.

The project team keep a detailed log of publicity. At the time of writing, OxFutures' Twitter account has 1,165 followers, and its newsletter has over 640 subscribers. There are 11 detailed case studies of SME beneficiaries on the OxFutures website.

Oxford River Cruises received a Greenfund Innovation grant to convert their fleet to electric propulsion

Indicator	Targets		Performance at Time of Evaluation[1]		Projected Performance at Project Closure		Overall Assessment
	Original	Adjusted	No.	% of Target	No.	% of Target	
Capital Expenditure (£m)	£530,000	£1,035,000	£566,271	55%	??	??	??
Revenue Expenditure (£m)	£2,669,614	£3,234,614	£3,341,961	103%	??	??	??
C1: Number of Enterprises Receiving Support	136	181	174	96%	181	100%	On track
C1f: SMEs receiving 12 hours of support	29	39	35	90%	39	100%	On track
C5: New enterprises created as a result of support	5	7	7	100%	8	114%	Due to be exceeded
C26: Number of enterprises cooperating with research entities	2	2	2	100%	2	100%	Met early
C29: Enterprise supported to introduce new product to firm	4	8	8	100%	9	113%	Due to be exceeded
C34b: Estimated GHG reductions (Efficiency)	665	896	742	83%	903	101%	On track
C34f: Estimated GHG reductions (Greenfund Innovation)	375	444	277	62%	448	101%	On track

1. All figures are from end of Q3, 2022. Expenditure figures are subject to a Project Change Request.

Part 3 - Evaluation of major work streams

This section assesses each of the major work streams in OxFutures:

1. GreenLab
2. Greentech
3. Greenfund Innovation
4. Energy efficiency audits and grants

The activities in each of these work streams are evaluated, and each sub-section assesses project delivery and management, outcomes and impact, and value for money, as required by ERDF summative assessment guidance.

3.1 Greenlab

Background and rationale

Oxfordshire Greenlab is a core component of the OxFutures programme, focusing on knowledge exchange and energy system innovation. Bringing together Oxford's two universities, the Low Carbon Hub, Bioregional and several SMEs, the original OxFutures project plan included this workstream to address market failures relating to SMEs' ability to access and capitalise on world-class knowledge and expertise, and to develop low carbon solutions. Greenlab had three overall aims:

4. Produce a smart energy supply and demand model for Oxfordshire.
5. Develop the business case for demonstrating how to integrate renewable energy into specific urban and rural locations, leading to at least one new Community Energy Service Company.
6. Boost knowledge transfer between universities and SMEs.

In order to address those aims, three sets of activities were planned: 1) hosting knowledge transfer workshops (target = 5); 2) creating smart energy supply and demand model for Oxfordshire; (3) implementing demonstrators of smart local energy systems in urban and rural locations. This section discusses each of these in turn, and concludes with an evaluation of additionality and value for money.

There is one ERDF indicator specifically associated with the GreenLab workstream: *C26 number of enterprises cooperating with research entities*. A target of two was set for the project, and achieved at an early stage, through the implementation of the urban and rural demonstrators (see below).

Knowledge Transfer Workshops

Five workshops were planned in the original OxFutures proposal, to be led by Oxford City Council through Low Carbon Oxford – a network of major emitters in the city. By the end of the first phase of the programme however, 14 workshops had been completed, covering a variety of topics related to low carbon mobility, building retrofit and eco-innovation (see Table).

Records indicate that 643 people from 398 separate organisations attended at least one of these events, including the high-profile launch of Oxfordshire Greentech, attracting 154 people. The OxFutures Conference in September 2019 was a full day event attended by over 120 delegates, featuring several break-out workshops. The sample of participant

Name of Event	Date
Energy Local	23-Apr-18
Retrofitting Oxfordshire	12-07-18
The Future of Transport is Electric*	14-Sep-18
OxFutures: The Next Generation	10-Oct-18
Fleets & Leasing*	15-Nov-18
GreenTech Launch	06-Feb-19
First/Last Mile Delivery *	01-Mar-19
eBikes*	10-Apr-19
One Planet Oxfordshire	30-Apr-19
A sustainable future for Oxford	16-May-19
OxFutures Conference II	27-Sep-19
Minimum Energy Efficiency Standards (MEES)	16-Oct-19
Charging & Infrastructure*	19-Nov-19
True cost of EV Ownership*	04-Feb-20
PART OF THE EV BUSINESS BREAKFAST SERIES	

feedback forms reviewed as part of this evaluation were overwhelmingly positive.

Since early 2020 - and despite COVID-19 - further workshops have been organised by Oxfordshire Greentech, which became independent from the OxFutures ERDF programme in April 2020. Topics have included reducing emissions in supply chains, circular economy business models, and building 'antifragile' SMEs.

Smart energy supply and demand model for Oxfordshire

The Greenlab work stream included plans to work towards operationalising a smart grid for Oxfordshire. Building on previous work conducted by Oxford University as part of the INTEGRATE project, this involved extensive knowledge exchange and partnership-building over the course of 2017 and 2018, culminating in the successful bid for Innovate UK funding and the creation of Project LEO (Local Energy Oxfordshire).

Activities which led to this outcome included:

- Building out the OxFutures network beyond the core partners, to include local SMEs and other energy sector stakeholders, including

Stakeholder map of the Oxfordshire Energy System

Brill Power, EcoSync, Siemens, Harwell and Begbroke Science Parks, and crucially, Scottish and Southern Electricity Networks (SSEN).

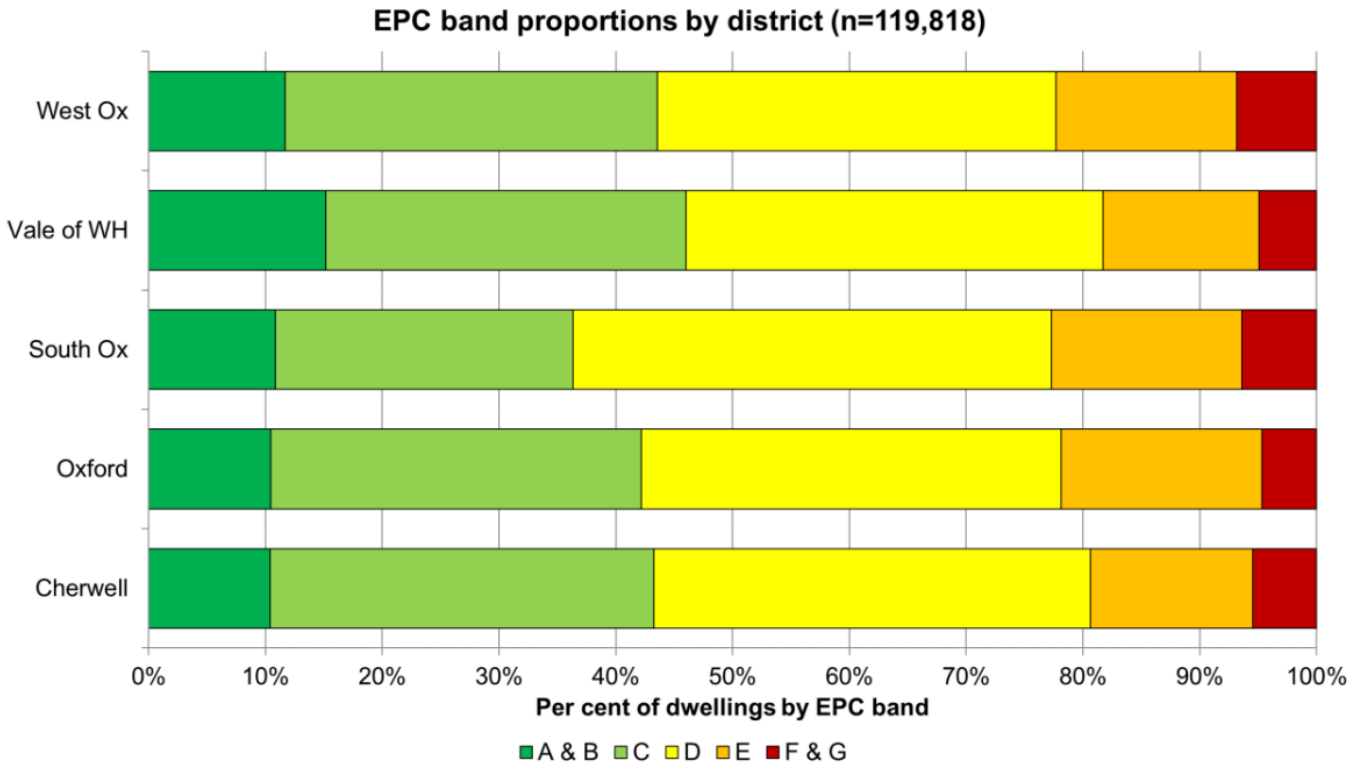
- Creating a map of renewable energy capacity broken down by Lower Super Output Area, combining data on the low-voltage network from SSEN, the Energy & Power group's power-flow modelling, and operational information on Low Carbon Hub assets.
- A feasibility study to investigate the use of waste heat generated at the Ardley Energy Recovery Facility.
- Helping to shape the Oxfordshire Energy Strategy
- Consulting with Innovate UK in the development stages of the Prospering From the Energy Revolution programme to help define its objectives.
- A series of workshops bringing together key stakeholders who would eventually develop and submit a proposal for Project LEO.
- Securing funding for Multi-SAVES, a collaboration between Oxford University and Siemens to explore the flexible use of energy assets across the university estate. This was the precursor project to 'Oxford Behind the Meter' which would be incorporated into Project LEO.
- Planning for the deployment of the Sandford Hydroelectric plant for energy storage, which would also then become part of Project LEO.

This element of the Greenlab work stream demonstrates clear value for money, with a plethora of capacity and network building activities, enabling several additional projects. In the case of Project LEO, the activities initiated by OxFutures have been scaled up and incorporated into demonstrations of energy system innovation with national importance.

LEMUR Mapping

ERDF funding through Greenlab work stream enabled work started by Oxford Brookes University (OBU) and Bioregional to be refined and scaled up for the whole of Oxfordshire. The 'Local Energy Mapping for (Urban) Retrofit' project was initially awarded funding by Innovate UK in 2015-16, with the aim of using neighbourhood and household-level data to identify priority areas for energy retrofits.

Rapid spatial assessments compile and analyse public datasets such as Energy Performance Certificates.



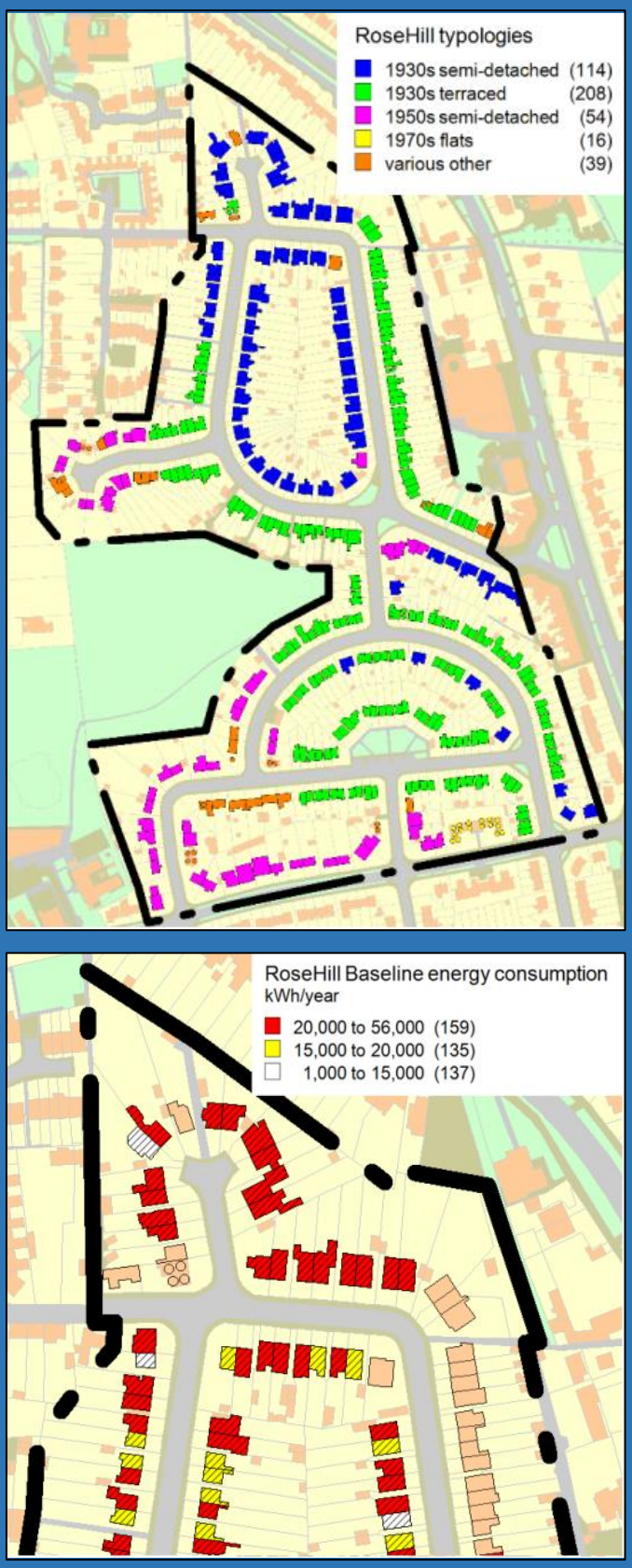
The LEMUR methodology is comprised of three main stages:

1. **Top-down spatial assessment.** A whole district is mapped using open data from the census, government departments and Energy Performance Certificates (see chart on previous page). Neighbourhoods are ranked according to priorities set by local authorities and other stakeholders (e.g. energy savings, fuel poverty, damp and mould)
2. **Local community engagement**. Areas with strong community interest and active grassroots organisations are selected as partners for further study, and detailed bottom-up data is collected via surveys, events, social media, school newsletters etc.
3. **Neighbourhood modelling** is then conducted to assess energy consumption and retrofit potential, including the prevalence of specific opportunities (e.g. loft or cavity wall insulation), drawing on OBU's DECoRuM software.

ERDF funding helped to operationalise the LEMUR methodology. For the OxFutures project, the OBU and Bioregional team produced a series of rapid spatial assessments for all Oxfordshire Districts, and for the county as a whole. In Oxford City, findings suggested that reductions in CO_2 emissions above 60% are possible at a cost of £6-£77/tCO_2, depending upon the package of measures used, and the cost of capital. This and similar estimates have proved valuable for local authorities when developing strategies for achieving net-zero across their own estate (e.g. council-owned housing and other buildings), and setting district-wide decarbonisation goals.

However, while the value of LEMUR in identifying priority areas and specific opportunities for domestic retrofit is clear, its translation into practical implementation has so far been limited. This mirrors the status of energy efficiency retrofit across the country, which has stalled due to a variety of intersecting challenges, of which insufficient data and information is just one.

Further, LEMUR is not the only spatial analysis tool for retrofit available in the UK, and when Cosy Homes Oxfordshire was launched as a scheme to accelerate the installation of energy efficiency



Example outputs from LEMUR, based on the Urban Demonstrator in Oxford City.

measures across the domestic building stock, Retrofit Works' mapping tool was chosen over LEMUR.

Nonetheless, this innovation holds significant potential to help accelerate the retrofit of UK domestic buildings at scale, and several academic publications produced by the OBU team have attracted international interest.

Urban Demonstrator

Rose Hill and Iffley Fields (RHIL) was selected as the site for demonstrating the LEMUR methodology, as well as other forms of energy innovation. This south-eastern suburb of Oxford has an active low-carbon community group, and swathes of housing with similar characteristics. A key aim of the urban demonstrator was to develop a capital investment project, either in renewable generation, neighbourhood scale retrofit, flexibility and storage, or usage of waste heat. These opportunities are discussed in turn.

Renewable generation: Building on a previous Innovate UK funded study called Project ERIC in which solar panels and in-home batteries were installed in 82 homes, the OxFutures team worked with Energy Local and the Rose Hill and Iffley Fields Low Carbon (RHILC) community group to explore the viability of installing rooftop solar across City Council owned homes. Following the Energy Local 'club' model, the proposal would involve Oxford City Council (OCC) funding installations, and selling the electricity direct to residents at below-market rates (~8p/kWh at 2018 prices). Above the rate paid for exporting to the grid (~2p/kWh), it was estimated that payback could be reduced from 20 years to around seven.

Unfortunately, OCC decided against investing in the scheme. When asked to comment on the reasons for this decision, an OCC officer said that their tenancy managers and energy advice officers were concerned about low-income social housing tenants' ability to commit to tariffs which could not be guaranteed to remain cost effective. They were hopeful that the Low Carbon Hub's ongoing project with Coop Community Energy and Octopus to trial solar tariffs would prove the viability of a similar model, and they would monitor this closely. Bioregional are also working on a similar solar self-consumption project called 'Repowering London', targeting customers on pre-payment meters.

Retrofit at scale: Working alongside the OxFutures team, RHILC received funding from the Urban Community Energy Fund to explore the potential application of the 'Energiesprong' method. Initiated in The Netherlands, the scheme involves replacing tenant bills with a service fee paid to landlords, who fund retrofit using innovative offsite manufacturing techniques to minimise disruption. While more than 800 properties in The Netherlands have benefited from the scheme, the RHIL feasibility study concluded that planning issues, the bespoke nature of the solution, and the lack of UK-based expertise or tailored financing products meant it was not an investable project at the time of investigation.

Waste heat: the Greenlab team also explored the viability of using waste heat from a local Sainsbury's supermarket to provide low-grade heating to nearby homes in Rose Hill. Detailed work was carried out and the required investment was estimated between £2.3m and £2.7m. A follow-up study was then funded by the Heat Network Delivery Unit and carried out by heat network experts Carbon Alternatives.

While no capital project was completed during the lifespan of OxFutures, significant progress was made towards developing investment-ready low-carbon projects in RHIL. A Memorandum of

(Above) Map of domestic heat demand in Rose Hill. The Sainsbury's supermarket at bottom of picture. (Below) Sainsbury's Heyford Hill supermarket. Source: UCEF report for RHILC.

Understanding was signed between Oxford Brookes University and the Rosehill and Iffley Low Carbon CBS Ltd, which met 50% of the C26 target. The fact that several further studies and projects focused on RHIL have been commissioned provides evidence of value for money. This includes the Clean Heat Streets programme commissioned by BEIS in 2022, led by Samsung. Learnings from these projects are relevant for communities across the UK, and in future, trials conducted elsewhere will reciprocally inform those pushing decarbonisation efforts in RHIL.

Rural Demonstrator

The rural demonstrator chosen for OxFutures was the sustainable housing and community development in the village of Hook Norton. The project, which has benefitted from two GreenFund Innovation grants, plans to build 12 Passivhaus homes and a community building. A Memorandum of Understanding was signed between Hook Norton Low Carbon (HNLC) Ltd, and the University of Oxford, agreeing to share knowledge, organise joint seminars and develop business opportunities. This MOU fulfilled the OxFutures C26 target.

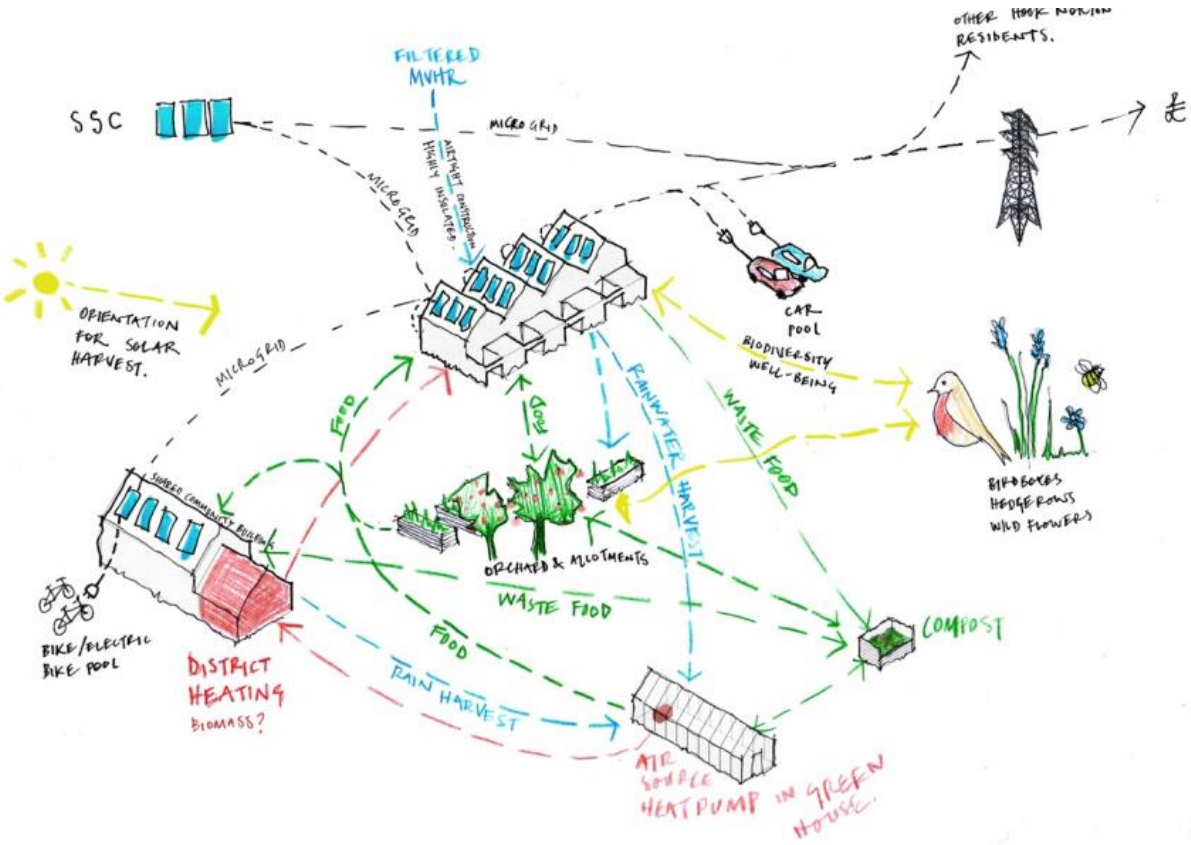
Besides highly energy-efficient buildings, the proposed development incorporates a variety of sustainability measures, including photovoltaics, air-source heat pumps, district heating, electric vehicle charging points and shared bicycle storage.

Additionally, the Low Carbon Hub have identified the development as having the potential to operate like a micro-grid, using digital technology to match local generation with demand, including an EV charging point for a shared car.

The project has taken longer than expected, and although planning permission was received in 2020, construction was delayed. Work began in August 2022 and HNLC commissioned Greencore Construction to complete the development - a local firm with excellent sustainability credentials. In this case, OxFutures can be credited with introducing the two SMEs which share environmental values: an example of its effectiveness in addressing market failures around the commercialisation of low-carbon solutions.

The Hook Norton micro-grid was incorporated into early-stage plans for Project LEO, as one of its 'plug-in' projects, and identified as a potential 'Smart and Fair Neighbourhood'. However, due to slow progress on construction, it was not selected as one of the five neighbourhoods chosen in summer 2021.

A conceptual diagram illustrating the sustainable elements of the Hook Norton community housing design



A car-club vehicle charging using a retrofitted lamppost in north Oxford

It is clear that without OxFutures' support via the GreenFund and other advice and guidance provided by LCH, progress on the Hook Norton development would have been slower, or stalled. However, the hope that it would provide a rural demonstration of a smart, flexible microgrid has not materialised in the timeframe of the OxFutures project.

Go Ultra Low Oxford

The Go Ultra Low Oxford (GULO) project is led by Oxford City Council, trialling different technologies for EV charging infrastructure across the city. Phase 1 of the trial involved three types of bollard-style chargers, the retrofitting of lampposts, and a solution allowing householders to trail a cable across footpaths using a special gully dug for the purpose. Phase 2 involves rolling out the best performing chargers, as well as installing rapid chargers for use by taxi drivers in Oxford.

In the early stages of the OxFutures programme, match-funding was provided by GULO, in exchange for the involvement of OCC staff; enabling the evaluation of Phase 1 conducted by the Transport Studies Unit at the University of Oxford; and sharing learnings with the business community through the EV breakfasts and the annual, high profile EV Summit.

While constituting a relatively small element of GreenLab, the relationship between GULO and OxFutures provided mutual benefit. It exemplifies the success of Oxford in attracting investment in sustainable innovation, and the ability of organisations like OCC and LCH to work together flexibly and productively.

Greenlab Delivery and Management

As demonstrated by the number of sub-sections above, the GreenLab workstream of OxFutures featured several projects and involved a plethora of individuals from many organisations.

The OxFutures consortium led by LCH should be commended on their coordination of such a variety of activities. GreenLab is a prime example of the thriving innovation ecosystem in Oxfordshire.

Greenlab Outcomes and Impact

There was just one ERDF indicator associated with the Greenlab workstream: C26. This was met at an early stage of the project.

This indicator does little to represent the impact of the Greenlab workstream, however. Greenlab has helped Oxfordshire to accelerate the transition to a zero-carbon economy and has fulfilled its three objectives.

Firstly, it made strides towards producing a smart energy supply and demand model for Oxfordshire, which the team is now taking forward through the high-profile Project LEO.

Secondly, through its Urban and Rural Demonstrators, it built the business case for integrating renewable energy (and energy efficiency measures) into different locations in the county. Greenlab also demonstrated the value of the LEMUR approach to neighbourhood-scale retrofit; took steps towards implementing district heating and renewable generation in east Oxford; and helped to promote the benefits of on-street and rapid EV charging in Oxford. Clean Heat Streets is yet another project which leverages the work undertaken as part of the Greenlab.

Related to its second objective, Greenlab - alongside the energy efficiency audit workstream - led to the creation of a new Energy Service Company called Energy Solutions Oxfordshire. This company was set up in 2021 and has delivered over 100 energy audits to businesses in Oxfordshire, on top of those funded by the OxFutures programme.

Thirdly, Greenlab promoted sustainable innovation through a series of events and knowledge exchange workshops, and enabled Oxford University and LCH to bring together key actors in the energy system who together created Project LEO, and continue to collaborate on low carbon innovation.

Greenlab Value for Money

The outcomes and examples of impact described above demonstrate Greenlab's outstanding value for money. When it comes to ERDF projects, Greenlab is unusual. Most projects focus on the delivery of grants and expert advice to SMEs which can be readily quantified and demonstrated. Both the OxFutures consortium and the funding bodies (Oxfordshire's ESIF committee and MHCLG) should be commended for investing in a workstream which involved greater risk in terms of delivery, with less easily quantifiable outcomes.

It is estimated that the total investment in the Greenlab workstream was £805k, of which £331k (41%) was ERDF grant support. This investment has clearly paid off.

3.2 – Oxfordshire Greentech

Background and rationale

Oxfordshire Greentech (OG) is a business network which supports and represents the interests of low-carbon businesses across Oxfordshire. Launched in February 2019, it now has 90 members. Its main activities include hosting events and workshops across a range of sustainability themes, providing one-to-one business support and information brokerage, funding and grant alerts, a regular newsletter and a jobs board.

Oxfordshire Greentech was part-funded by the OxFutures programme, which helped it during its inception and launch phases. The OxFutures interim evaluation report, published in May 2020, evaluated the success of the network after its first year of activity.

That evaluation concluded that Oxfordshire Greentech met an important set of needs amongst SMEs in the county: for greater coordination, representation, and a platform for knowledge sharing and skills development. Substantial background research and stakeholder consultation meant that the network was designed to address the real needs of potential members; and the team at Bioregional behind the network worked closely with Cambridgeshire Cleantech to emulate their success in Oxfordshire.

The interim evaluation found that the network represented excellent value for money, having recruited 90 members in its first year with a good spread across Oxfordshire locations and market sectors. Before the pandemic, Oxfordshire Greentech hosted a range of activities from workshops to Special Interest Groups, as well as providing an informative newsletter and opportunities for members to find contract and collaboration opportunities.

Oxfordshire Greentech was not included in the extension of ERDF funding for OxFutures, becoming independent from April 2020. Nonetheless, this section of the Summative Assessment evaluates how the network has fared since ERDF support finished.

Greentech: out on its own

Having been well-prepared for its post-ERDF independence, the Oxfordshire Greentech was faced with the challenge of achieving financial sustainability in a pandemic.

It responded by moving all of its activities online during 2020, and by offering members a six-month free extension on their membership. Attendance at online events was high during the national lockdowns, with webinars typically attracting 30-50 attendees.

Since COVID-related restrictions have been lifted, Oxfordshire Greentech – like many businesses – have sought a hybrid approach to events and member-engagement. They now offer a variety of in-person, online and hybrid activities. The network

organisers have noticed a strong appetite for in-person networking events since mid-2021, and attendance at webinars has fallen. They also reflected that in-person events offer better opportunities to recruit new members.

They now hold events around once a month, often in collaboration with other networks and organisations (see box, right). These are well attended. For instance, the Science and Technology Facilities Council (STFC) sponsored the Greentech team to co-host a series of Access to Finance workshops in 2022, which were attended by around 50 people each.

Greentech beyond the pandemic

At the time of writing, in late 2022, membership stands at around 90 businesses: similar to the number at the end of ERDF funding. The team should be commended on this achievement, given the difficulties of running a network through the pandemic with no ERDF funding. Following the end of the six-month free membership extension, all discounts were ended. The Greentech team explained that while they lost members at this point, the main reason cited by departing members was the lack of time they were able to dedicate to being involved in the network, rather than any criticism of the network itself.

Besides membership subscriptions, Oxfordshire Greentech generates revenue from consultancy projects and by hosting events sponsored by partners. They continue to work closely with Cambridgeshire Cleantech, who recently subcontracted the running of 'Mobimix', a pilot project creating a hub for low carbon mobility innovation projects. Oxford Brookes have also provided funding, via Research England, to help the Bioregional team to build the network, with a particular focus on recruiting larger members within and beyond Oxfordshire. Cambridgeshire Cleantech has successfully recruited members from outside the UK, typically seeking investment opportunities and using their 'innovation search' function. Oxfordshire Greentech plan to use the Research England funding to strengthen their own offers.

Notable successes in the last 18 months include a major event following COP26, featuring 13 keynote

12 months of Oxfordshire Greentech Events

- **The Environmental Sustainability Innovation Day at Begbroke Science Park**, June 2022
- **'Make a Difference' business workshop: do good for people & planet** *May 2022*
- **Members' pub social** *April 2022*
- **Access to Finance Conference for Innovators: Session 3 – Space Tech** *March 2022*
- **Access to Finance Conference for Innovators: Session 2 – Clean tech/energy** *February 2022*
- **Innovative solutions to achieve sustainable indoor air quality** *February 2022*
- **Sustainable Living: Learn from leading One Planet Living communities** *February 2022*
- **Funding and scale up opportunities for your clean tech business** *February 2022*
- **Access to Finance Conference for Innovators: Session 1 – Coaching masterclass** *January 2022*
- **How to attract and keep the right talent in a tough climate** *January 2022*
- **Future focus series: Guilt-free holidays and travel?** *December 2021*
- **What partnerships does Oxfordshire need to deliver sustainable transport solutions?** *November 2021*
- **Future focus series: What will our food look like in the future?** *November 2021*
- **Beyond COP26: How Oxfordshire is powering the zero carbon transition** *November 2021*
- **Greening the web: How your business can help** *November 2021*
- **Future focus series: Saving the world from plastic waste** *November 2021*
- **Carbon Jargon – An exploration of sustainability terminology** *October 2021*
- **Cleantech Venture Day** *October 2021*
- **Henley Eco Business Fair** *September 2021*
- **How to use neuroscience to ensure your low carbon business thrives** *September 2021*
- **The Future of Low Carbon Mobility** *September 2021*
- **Roadmap to net zero | Zero Carbon Tour** *September 2021*
- **How to create more value in your business using circular business models** June 2021

speakers over two days. Alongside OxLEP, Greentech also led the Energy Pathfinders 2050 initiative, which showcased Oxfordshire-based green businesses and gave awards to three innovative SMEs.

The principal challenge facing the network is its financial sustainability. As highlighted in the interim evaluation, membership subscriptions are necessary but insufficient. The Greentech team benefits from being integrated into successful consultancy Bioregional, as the revenue generated by the network alone would be insufficient to fund their salaries. However, being part of a commercial consultancy also means that they are restricted in the time they are able to devote to the network, and they rely on members to contribute time and resources beyond their annual subscriptions.

Since issuing a survey of members as part of the OxFutures interim summative assessment, Oxfordshire Greentech have continued to survey their members annually. In 2022, members ranked environmental sustainability second in a list of business priorities, after growing revenue. 80% of respondents said that the opportunity to network with other sustainable businesses was amongst the main reasons they chose to join Greentech, while 88% had already identified potential partners and collaborators this way.

When asked to identify the sustainability challenges they were trying to address, responses varied widely across technical, behavioural and commercial issues, including becoming net-carbon positive, transitioning to an 100% EV fleet, and influencing others to adopt sustainable practices. As expected from a cohort of environmental leaders, a clear theme was that members are looking to push the boundaries of low carbon innovation.

Greentech Outcomes, Impact, and Value for Money

It is estimated that around £523k was invested in the set up and running of Oxfordshire Greentech, of which £298k (57%) was ERDF grant money.

Oxfordshire Greentech is a clear success story, having maintained its membership and revenue income since becoming independent from OxFutures. It is a demonstration of clear value for money, having leveraged ERDF funding to launch a much-needed network of SMEs and larger organisations in the low-carbon sector.

3.3 Greenfund Innovation

Background and Rationale

The Greenfund Innovation Programme (GIP) was administered by Low Carbon Hub (LCH), the lead partner in the OxFutures consortium. GIP offered match-funded grants to SMEs developing innovative products and services in support of the sustainability transition.

The rationale for Greenfund Innovation support was based on the market failure associated with bringing new low carbon technologies, business models and other solutions to market.

SMEs could apply for grants in two stages. The first was a **feasibility** grant, offered at 50% up to a total of £25,000. Successful applicants could then apply for an **implementation** grant once they had proven the feasibility of their innovation. With up to £25,000 also available, this grant contributed 25% towards total project costs.

The Greenfund Innovation workstream is evaluated using one survey of SME beneficiaries conducted in March 2020, and another in August 2022. Wave 2 was issued in August 2022, but only received responses from three SMEs. This is likely to be due to the time elapsed since applying for and receiving grants, and a sense of 'consultation fatigue' from being approached for feedback on many occasions.

Interviews were also conducted with several grant recipients. Members of the Grant Assessment Panel were interviewed; and desk-based analysis was conducted of low-carbon innovation funding available to SMEs. Seeking counter-factual insights, several SMEs who were rejected for grant funding were approached for interviews.

Greenfund Delivery and management

Overall, SMEs were very positive about their interaction with OxFutures and the grant application and claim process. 8/10 survey respondents said that the application process was easy or very easy, and of the 9 respondents saying that they used help from the Low Carbon Hub to develop their application, all found this either useful (3/9) or very useful (6/9).

In interviews and free-text survey responses, SMEs confirmed the value of help received from the project delivery team.

"The Low Carbon Hub worked really hard to make the painful elements of the grant (as imposed by the ultimate funder) as easy as possible - the Low Carbon Hub couldn't have been more helpful."

Anonymous SME beneficiary

While experiences of the grant application process were strongly favourable, some SMEs expressed frustration with the grant claims process. In recent years, ERDF funding in England has become more complex and demanding. Partly due to funds being 'clawed back' from the UK by the European Commission due to non-compliant procurement activities and other mismanagement, the Department for Levelling Up, Housing and Communities (DLUHC) has stepped up requirements for defrayal evidence and tightened restrictions on what expenditure is eligible for grant support.

One interviewee said that their claim consisted of 200 invoices, all needing to be provided as evidence, alongside proof of defrayal due to strict ERDF requirements. Another SME said:

"It takes about a person-day to process, prepare and submit each claim. This is a snag with grants that cover only external costs. The grant is of course welcome, but the cash lost through admin time is considerable".

Anonymous SME beneficiary

Cashflow was also cited as a concern, given the length of time between incurring expenses and being reimbursed by ERDF funding. One survey respondent said:

"The expectation that an SME can deal with a 6-9 month delay in paying a grant on incurred expenditure is completely unrealistic. We were fortunate in having built up earlier reserves. While recommending OxFutures to other SMEs I would warn them that they would be bankrolling the project in its entirety."

Anonymous SME beneficiary

Another SME suggested that a more generous, 75% grant would be very welcome, alongside a 60-day maximum period for payment. However, the same respondent said that they appreciated the transparency and openness of the LCH team, as – unlike many other sources of funding – they gave a 'good sense of how likely it is the grant will be awarded'.

Overall, the delivery and management of the Greenfund Innovation Fund was highly valued by SME beneficiaries. Despite this being the first ERDF project managed by the Low Carbon Hub, they have proved to be dependable and diligent.

Greenfund Outcomes and Impact

The GIP awarded grants to 12 SMEs covering a range of projects, from developing an artificial intelligence system to switch off heating in unoccupied rooms, to the development of an electric narrowboat. A total of £697k was awarded for feasibility grants, and at the time of writing (Sept '22), £501k (72%) had been claimed by SME beneficiaries. The primary reason for underclaimed grants was due to project scope changes: SMEs decided not to go ahead with the investment due to a change in strategy or direction (for instance, induced by COVID-19). In some cases, certain elements of a package of measures were not completed.

Case Study: Duffin Associates

Duffin Associates are developing a new solar pv tracker to maximise efficient and generation of solar panels

Duffin Associates Limited specialise in commercialising low-carbon technologies, with clients including government, Carbon Trust, renewable energy developers and banks.

Tony Duffin had been working in this field for a long time (where he came across the OxFutures programme) and had spent the best part of three years wondering why a more affordable solar panel that moves with the direction of the sun wasn't on the market.

Tracker systems exist but have almost no market penetration in the UK, due to increased complexity and cost. This project aims to develop a patented, simplified tracker into a commercial design, increasing PV generation per kw installed.

Prototypes were initially made with cardboard cut-cut outs, but the design moved forward, and DAL reverse-engineered the tracking problem, developing a 2-axis PV tracking system. A working scale prototype was developed and a submitted in Nov 2018.

The existing patent application offers IP protection against competition, but rapid development is at least as important as many potential competitors exist.

Realising more funding was needed to move the project to the next level, Tony reached out to OxFutures and applied for an innovation grant. Writing the grant application proved an especially useful, evaluative process as lots of grants are competitive and it enabled objectives to be clarified and number to be finalised.

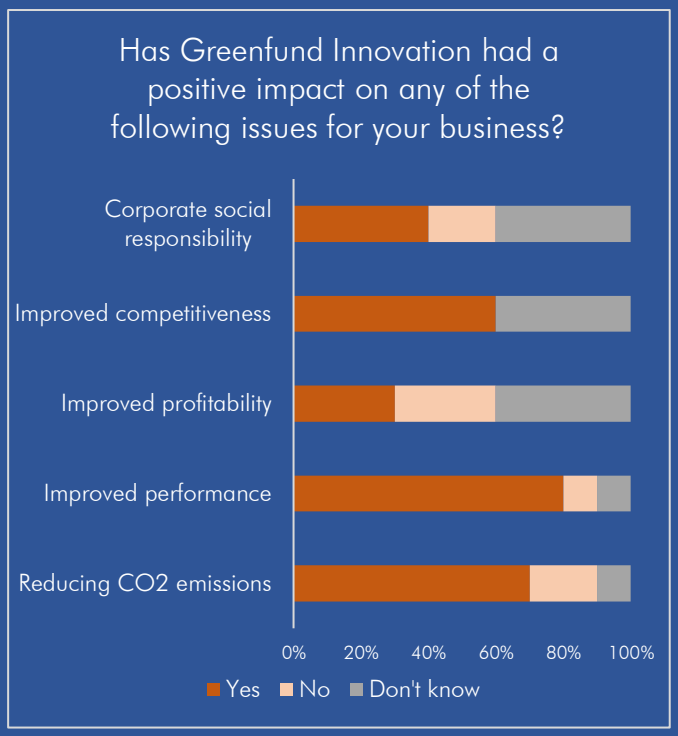
Tony Duffin said: "OxFutures had a really clear, targeted market brief which meant I had to be specific about project goals and the financial aspects of the project. Being able to talk through the process and get feedback from Alison was great. Overall, it was an extremely valuable process."

Interviews and surveys revealed that in a small number of cases, it became clear that some or all of the investments outlined in a grant application were discovered to be ineligible for ERDF support after the grant had been awarded. In such cases, SMEs expressed frustration but were highly complimentary about Low Carbon Hub, who clearly explained the reasons for this and often worked actively and creatively to find a way to support the SME regardless.

Of the 12 beneficiaries, four built on their feasibility grant to win an implementation grant. The total awarded for implementations grants was £579k, of which £525k (90%) had been claimed at the time of writing.

SMEs completing the survey reported on the impacts of the grant on their business. The chart below shows that 8/10 reported 'improved performance' as a result of the grant, while seven businesses agreed that the grant had led to reduced CO2 emissions. Impacts on profitability, competitiveness and corporate social responsibility were more mixed.

Survey respondents were also asked whether the outcomes seen so far were consistent with their expectations at the time they completed their application. Five SMEs said they were consistent, while three said it was 'too early to tell'. The remaining two businesses said that outcomes had fallen short of expectations. One of these put this down to restrictions on funding meaning that the project wasn't eligible for all the support requested



in their application; while the other said that the innovation they were developing had not proven a success upon deployment.

Interviews provided further insights into the impacts of the grant on SME beneficiaries. One business highlighted the value of the funding for early stage ideas because it focused their minds on what they needed to demonstrate but didn't swamp them with money too early in the process. Covering half their external costs allowed them to do what was essential without running away with their idea or getting overly ambitious.

Hook Norton Low Carbon's ambitious plans for a community housing development have been advanced with support from the GreenFund

Another grant recipient used the money to set up a Community Land Trust and said this would not have happened without LCH's support. The applicant said:

"It would have been difficult to justify putting up £75,000 to set up a new organisation. But with the grant underwriting that, it helped to de-risk the communities' investment".

Tim Lunel, Hook Norton Low Carbon

Beyond awarding grants, the OxFutures team has supported its SME beneficiaries in other ways. For instance, EcoSync was given a grant to develop their innovative technology for optimising heating in commercial buildings by linking schedules to room occupancy. Where appropriate, the energy assessors carrying out audits on SME premises as part of the energy efficiency work package were able to recommend this technology in a small number of cases. This led to one beneficiary – an Oxford College – installing Ecosync's technology across its site. They were also supported with an OxFutures energy efficiency grant to do so.

The OxFutures team have followed-up with nearly every beneficiary of the GreenFund Innovation grant, and feature a range of case studies on their website.

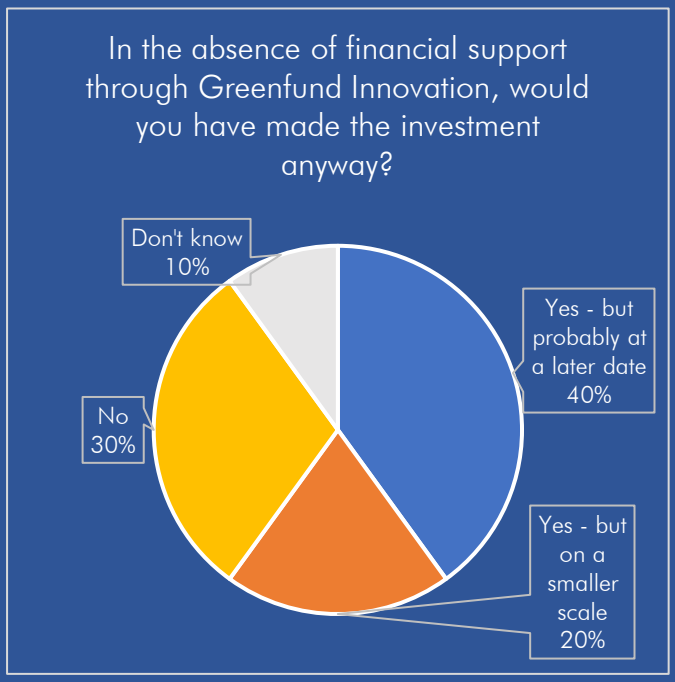
Greenfund Value for Money

Counter-Factual Analysis

SME beneficiaries were asked to explain what would have happened to their eco-innovation if they had not been awarded a grant.

The chart below shows that six of ten SMEs said they would probably have made the necessary investment anyway, but these investments would have been at a smaller scale, or delayed. Three SMEs said they would not have gone ahead with the project without grant funding.

One SME applicant, a developer of sustainable homes, was successfully awarded a grant to develop low carbon kitchen installations but did not end up claiming it because demand for the innovation in question had proven insufficient. They approached



the panel about an alternative project: to conduct a life cycle assessment (LCA) of their building materials. However, when considering the time it would take for the panel to review the application, to collect three quotes and commission the work, the SME decided instead to fund this project themselves without grant support. In both cases, value for money was demonstrated: a grant was not claimed due to lack of demand, and the necessity and high priority placed on the LCA showed that a grant would have not delivered additionality.

Interviews were conducted with two SMEs which had applied for a grant but been unsuccessful. One application involved public engagement on achieving Passivhaus standards in a new housing development, while the other was to develop a more

Greencore Construction decided to invest in a life cycle assessment of their innovative building materials without grant funding

cost-effective method of installing electric drive-trains into used 4x4 off-road vehicles.

Without OxFutures funding, the housing project was able to secure funding from the Town Council and other individual donations for their public engagement activities. The applicant reported that the effect had been to delay their planning application and that the overall delay had led to increased costs because of the rising price of building materials. This applicant expressed no dissatisfaction with the grant assessment process, and thanked the Low Carbon Hub for its support and feedback.

The second applicant was also positive about their application experience. They explained that the reason given by the grant panel for not awarding funding was because the retrofitted vehicle already existed on the market. Despite making the case that the investment would help to drive down the costs of conversion, it was their understanding that the OxFutures panel wanted to fund technologies at earlier stages of development. In this case, the company which would have carried out the conversion (which happened to be another grant recipient) went on to win funding from Innovate UK to convert a larger number of vehicles, in partnership with the Glastonbury Festival. The interviewee said that the grant rejection had not been a major setback for his company. They still offer the 4x4 conversion as part of their services, but are not able to take a prototype when visiting new customers (e.g. farmers). They predict that a prototype would have helped to boost sales significantly.

Interviews were also conducted with grant panel Innovation grant was focused on early-stage innovations. One panel member pointed out that the funding available was relatively small compared with other sources such as Innovate UK, but that these awards could be critical to 'help SMEs to get on their way'. As well as enabling prototype development, grant recipients could use their grant success in future fundraising efforts.

Case Study: EcoSync

EcoSync are aiming, through innovative technology, to reduce the energy consumption and carbon footprint of buildings by 40%. Their solution: stop heating empty rooms.

Larger organisations spend millions on their energy bills while 70% of their heated rooms are empty and 40% of the energy is wasted. The University of Oxford and many of its colleges experience this problem, with much of their historic building stock lacking modern Building Management System (BMS) controls.

To combat this, EcoSync have created a cloud-based platform that will connect existing building technologies and thermostatic radiator valves so that only occupied rooms are heated.

The team applied to OxFutures for innovation grant funding and were successful in being awarded a £13,000 grant to develop the next phase of the technology.

This would integrate occupancy detection technology, using mobile phone signals, to allow EcoSync to add rooms to zoned heating which are not in the booking system, such as offices and shared areas to create better controlled heated areas in entire buildings. This would aim to reduce energy consumption by up to 40%.

Lady Margaret Hall have installed the system in one of their student accommodation blocks. Each student has the ability to dial their heating up or down using their phone, whilst the building manager can set thresholds it can't go above or below. Over time the system learns when students are normally present or absent from their room during the week and programmes the heating accordingly.

During 2022 EcoSync fitted 1618 of their radiator valves, avoiding 59MWh of gas consumption during the 12 months. The proportion of heat saved in the four areas of Oxford colleges where devices are fitted are St Peters 53%, Corpus Christi 45%, Lady Margaret Hall 33% and St Edmunds Hall 28%.

3.4 Energy Efficiency Audits and Grants

Background and rationale

The original OxFutures bid included plans to conduct 136 energy efficiency audits for SMEs in Oxfordshire. This target was extended to 181 in 2020 and met in October 2022. The bid cited the 'bounded rationality' of SMEs with respect to energy savings, and the provision of free expert audits sought to address the problem of information deficit which was preventing businesses from implementing cost-effective measures.

Once an SME had received an audit, OxFutures provided the opportunity to apply for a match-funded grant for implementing one or more of the energy efficiency measures recommended in the audit report. SMEs could receive support for up to 25% of the costs.

This section evaluates the impact of the audit and grants for energy efficiency. It outlines the audit methodology and analyses the delivery and management of the workstream, including the geographic and sectoral distribution of beneficiaries. It then reports on the impacts of the audits and grants, drawing on evidence from EiE's data monitoring process, an additional beneficiary survey, interviews, and site visits. The section ends with counter-factual analysis.

Delivery and management

OxFutures Audit Methodology

The OxFutures Business Relationship Manager was the first point of contact for SMEs seeking energy audits. After an eligibility check, details were passed to the EiE auditors.

Prior to a site visit, SMEs were sent a data sheet to complete that included annual site energy use for fuel types (electricity, gas, other). There were also questions about building age, area, and listed status.

During the site visit, auditors discussed energy management practices with the SME and conducted a walkthrough of the premises. The walkthrough reviewed key energy-using processes, equipment, and gave the auditors the opportunity to speak with key staff.

A draft **energy audit report** was issued to SMEs following the visit, including a summary of recommendations and estimated savings (kWh, financial, and CO2e savings) as well as costs. The report estimated annual energy consumption and provided a benchmark (per m2) comparing current consumption, average for the sector (if appropriate), and potential consumption if all recommendations were to be implemented. The report also included details of each recommendation (rationale, actions, and an explanation of costs and savings). Energy savings were based on a 12-month period and converted to financial savings using the rates paid by each SME to their utility suppliers. Audit reports included a resources section detailing funding opportunities and any further information on topics not covered in the recommendations.

In order to encourage action, the team explained to SMEs that a conversation or face-to-face presentation was required to finalise the audit

Ewelme Watercress Beds received a grant to support the installation of 3.7kW solar array on the Ewelme Watercress Centre.

process, and make SMEs eligible to apply for a grant from OxFutures' Greenfund.

Measuring energy savings. Regardless of whether SMEs receiving energy audits went on to apply for a grant to implement recommended measures, the EiE team issued online surveys to track energy savings made as a result of their site visit and report.

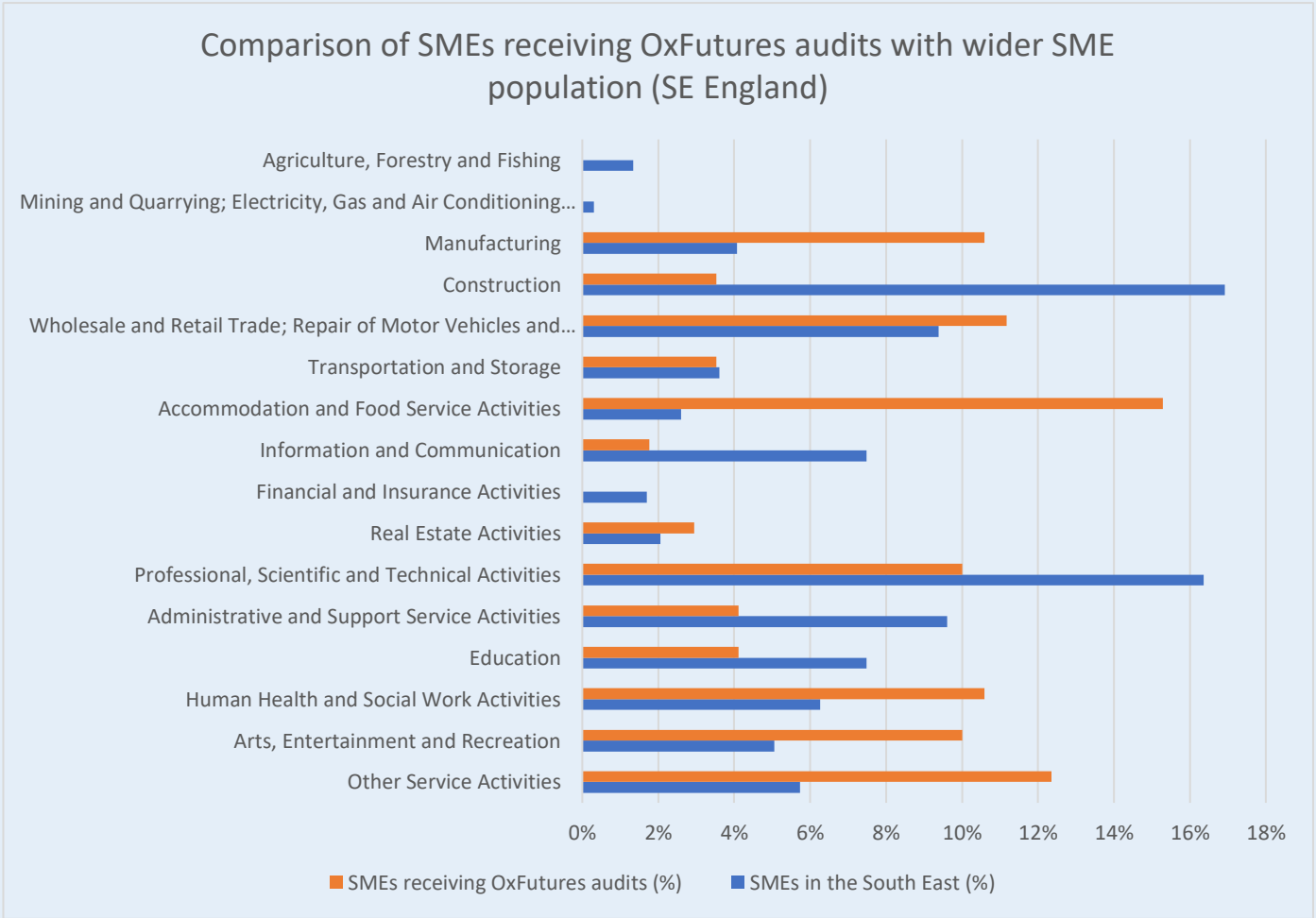
Bespoke surveys were created listing each recommendation made. SMEs were asked to provide an update on progress against each measure, with options:

◦ completed ◦ partially completed ◦ intending to complete ◦ not intending to complete.

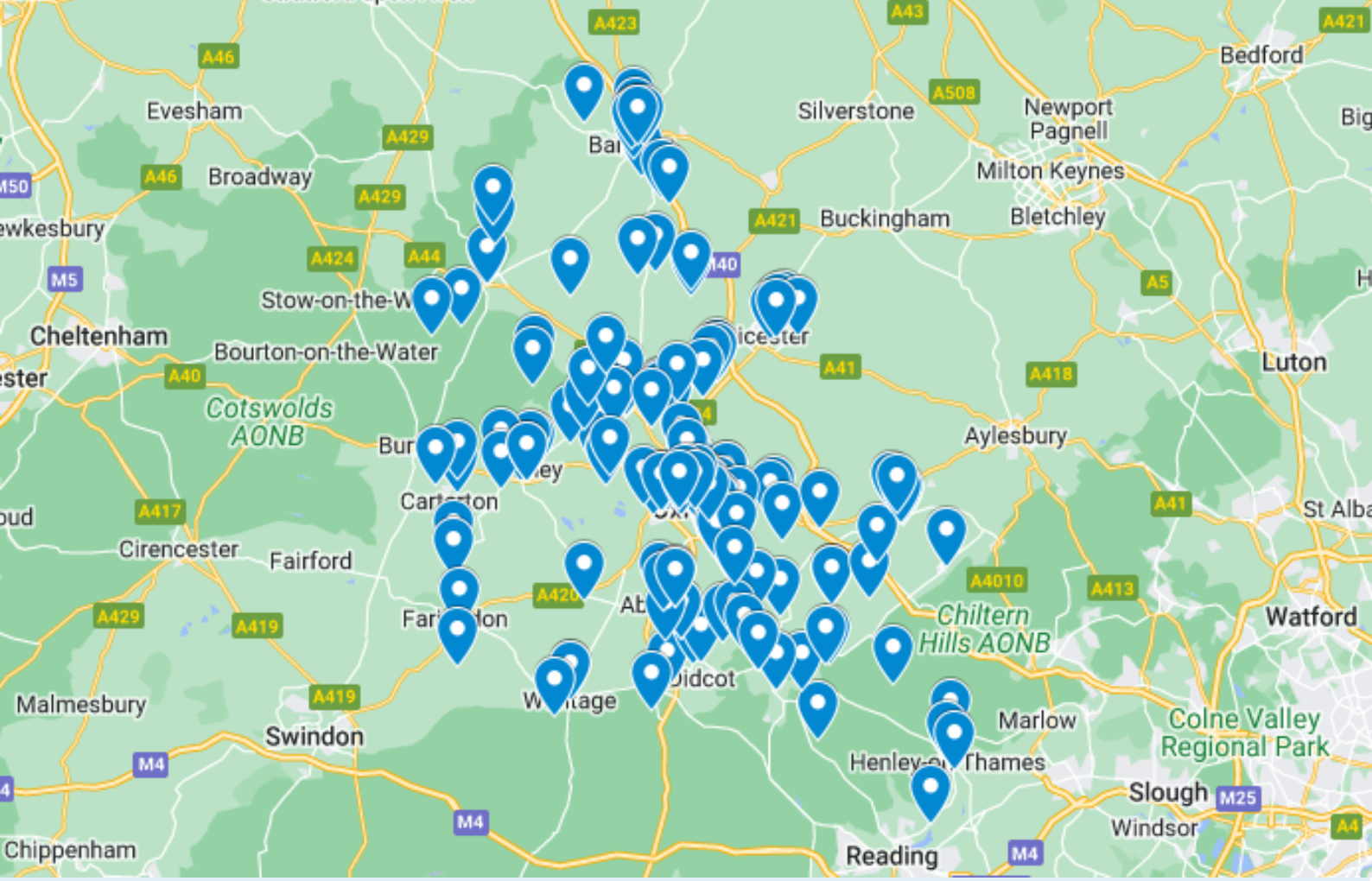
For measures reported as 'completed', 100% of the projected savings from that action were recorded as achieved. If a response was 'partially completed' 75% of the savings were recorded. Surveys were issued to SMEs between 8 and 10 months after the audit to allow time to act on the report.

Reach and Representativeness

The graph below compares the group of SMEs receiving OxFutures audits with the wider SME population in the south-east of England, based on SIC Level 1 groupings[2]. This shows that the OxFutures team has been successful in reaching some sectors more than others. For instance, SMEs such as hotels, pubs and restaurants make up 15% of those receiving audits, but represent only 3% of all SMEs in the region. By contrast, the largest SME sector is construction (17%), but only 4% of those audited by EIE were in this sector. Of course, it is not the aim of OxFutures to deliver support to a representative selection of businesses across sectors,



[2] Data were gathered from Table 18 of BEIS' Business Population Estimates, 2021. SIC data and website information was used to classify the SMEs receiving audits.



Map showing geographical distribution of SMEs receiving energy audits from EiE

but to focus on where their services can have the greatest impact. Whilst construction is one of the largest sectors by number of businesses, these often operate at multiple sites, making them less appropriate clients.

By contrast, accommodation and food service businesses nearly all operate from fixed premises and some use significant amounts of energy for heating and cooking. Similarly, 11% of audits were provided to manufacturing SMEs, which represent only 4% of businesses; but their energy savings potential is greater than average.

Other sectors **over-represented** by this stream of work include Health and Social Work Activities; Arts, Entertainment and Recreation; and Other Service Activities. The OxFutures team have had success in reaching non-profit organisations such as community halls and societies (here classed as Other Service Activities), through existing networks and the reputation of LCH and EiE.

Sectors which are ***under-represented*** include Information and Communication; Professional, Scientific and Technical Activities; and Administrative and Support Service Activities. In these sectors, sole traders represent between 76% and 77% of the total number of businesses, compared for instance with 40% in the Accommodation and Food Services sector. Sole traders are more likely to occupy domestic properties or shared working spaces, and are not the ideal SMEs to be targeting for energy efficiency measures.

Businesses in the agricultural and financial services sectors are not eligible for ERDF support, while SMEs offering education services are only eligible if they are *not* providing education to school-aged children. Additionally, more than 90% of SMEs in the education sector are sole traders (e.g. self-employed tutors).

In an interview with one of the grant assessment panel members, they explained that as well as focusing on projects where the energy savings potential was greatest, they supported the idea of focusing efforts on particular sectors, because of the potential for spillover effects within networks such as community groups in Oxfordshire.

The map of audit site locations shows a fair distribution across the population centres of Oxfordshire. Just under a third of audits were conducted in Oxford City.

Insights from interviews and site visits

Interviews were conducted with 17 SMEs receiving energy audits. The vast majority of businesses were complimentary about the delivery and management of the audit, and several spoke positively about the individuals they had engaged with at Low Carbon Hub and EIE.

One recurring theme from interviews is that SMEs placed a high value on the expertise of the energy auditors, who were seen as trusted and impartial.

Another theme was that SMEs valued having quantitative, reliable figures about energy savings potential. Several explained that these figures helped them to develop a business case internally and when seeking external funding. One client said that although they were motivated to take action on energy efficiency, the audit acted as a 'nudge' and gave them confidence to take action.

Feedback from interviewees who had received grant support as well as an audit mirrored the experiences of those claiming Greenfund Innovation grants. Several found the claims process to be frustrating due to the time taken to be paid, and the detail required especially where multiple measures and invoices were involved. Others said it was straightforward, however. SME beneficiaries were unanimous in saying that the OxFutures team had been helpful in guiding them through the process.

Case Study: Pietersen Fine Furniture

Pietersen Fine Furniture received an OxFutures grant from GreenFund to install a biomass heating system to save carbon emissions.

Pietersen Fine Furniture Ltd specializes in the manufacture and installation of bespoke furniture and fitted interiors. In 2018 they moved into a 1960s industrial unit.

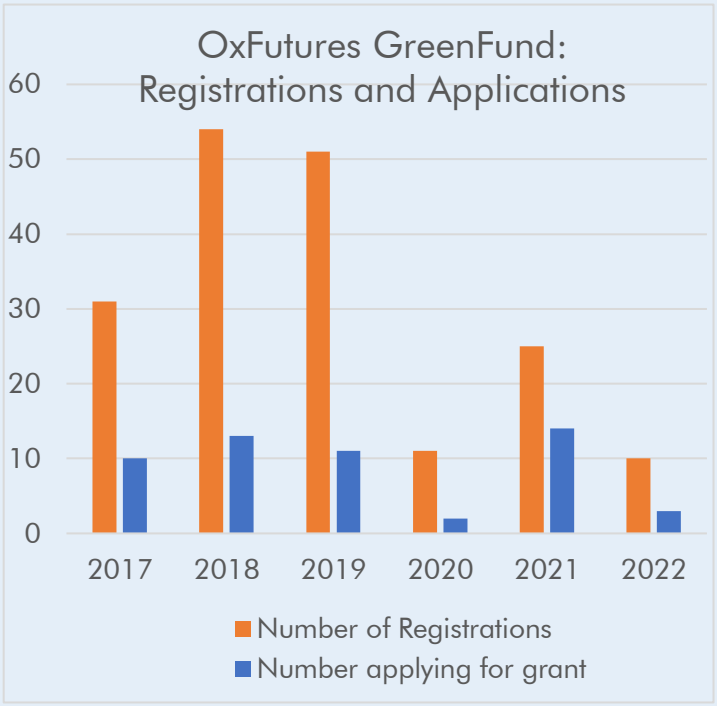
PFF wanted to make their work and process more environmentally friendly. They constructed their own double glazing for the premises, then realised that they could reuse/recycle the waste that was created from the manufacturing of the furniture to generate heat for the workshop. This was a win-win situation, as they saved money by burning wood waste.

A biomass heating system was chosen that would burn MDF as well as 'unprocessed' woods. Biomass heat systems operate on the principle of radiant heat, which warms an area faster and more efficiently than warm air being blown through a home's vent system. Therefore, you can not only benefit from a reduction in wood waste disposal or landfill costs but also eliminate your heating bill.

Talbott's installed a biomass heating boiler which could burn MDF, 'unprocessed' woods and a range of alternative biomass fuels. The installation of this boiler offers a technically simple and cost-effective means to heat buildings, whilst able to save carbon emissions. Talbott's are an organisation based in the Midlands and offer a comprehensive range of biomass & wood waste to energy solutions.

Uptake of Grants

The graph (right) shows the numbers of SMEs registering their interest in the OxFutures GreenFund, and those going on to apply for grants. As expected, interest was strongest in the early years of the project but declined when the grant became over-subscribed and when the pandemic put a halt to business as usual. In 2021, the number of grant applications recovered as the ERDF extension was secured, but the number of registrants was lower n pre-pandemic levels. This can be largely explained by the fact that the grant applicants were made up of those already registered with the programme: the project team had developed a 'pipeline' of potential applicants, and did not need to invest significantly in marketing to reach new businesses. Note, this chart includes applicants for the GreenFund innovation



Case Study: Magdalen Road Studios

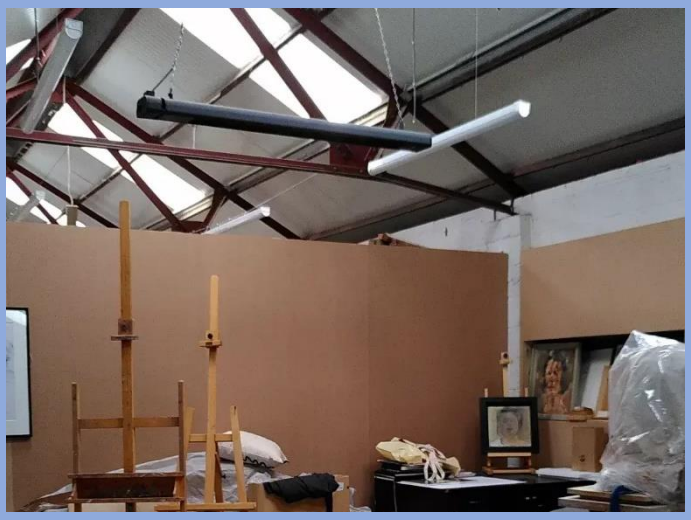
Magdalen Road Studios received an OxFutures grant to install LED lighting, insulation, and infrared heaters to make the space a more welcoming environment for artists and visitors.

Following a free energy audit, Magdalen Road Studios – an arts charity run for the benefit of the community – learnt that by upgrading their lighting and heating systems they could reduce their energy bills and cut their carbon emissions. The building was also very poorly insulated and therefore a cold and uncomfortable space to work in the winter.

They approached our GreenFund with an application to fund these changes and received a grant of £10,000. The remaining costs were funded through Oxfordshire Local Enterprise Partnership (OxLEP).

OxLEP funded work: The work to replace the roof has increased the daylight by 30% through transparent roof-lights that defuse UV light. The previous roof was an asbestos uninsulated construction and leaked. Together with faulty drain pipes and guttering this had previously made the space very damp.

OxFutures funded work: The new LED lighting not only saves energy, but has three settings so artists can choose the type of light they want: white light, warm light, or daylight equivalent.



Infrared heaters with sensors – which instead of heating the air, heat objects, surfaces, and people in a room directly – have also been added as suspended units from the ceiling, which allows the studios to be heated flexibly depending on occupancy.

The roller doors at the front of the building have been retained, but these and all the solid exterior walls have been insulated with 100mm of Rockwool, to improve the thermal efficiency of the building. The roof insulation minimises heat losses in winter, reduces heat gains in summer, improves comfort levels for visitors and reduces annual energy bills by reducing the amount of energy needed to heat the building.

grants, but most applications were for energy efficiency measures.

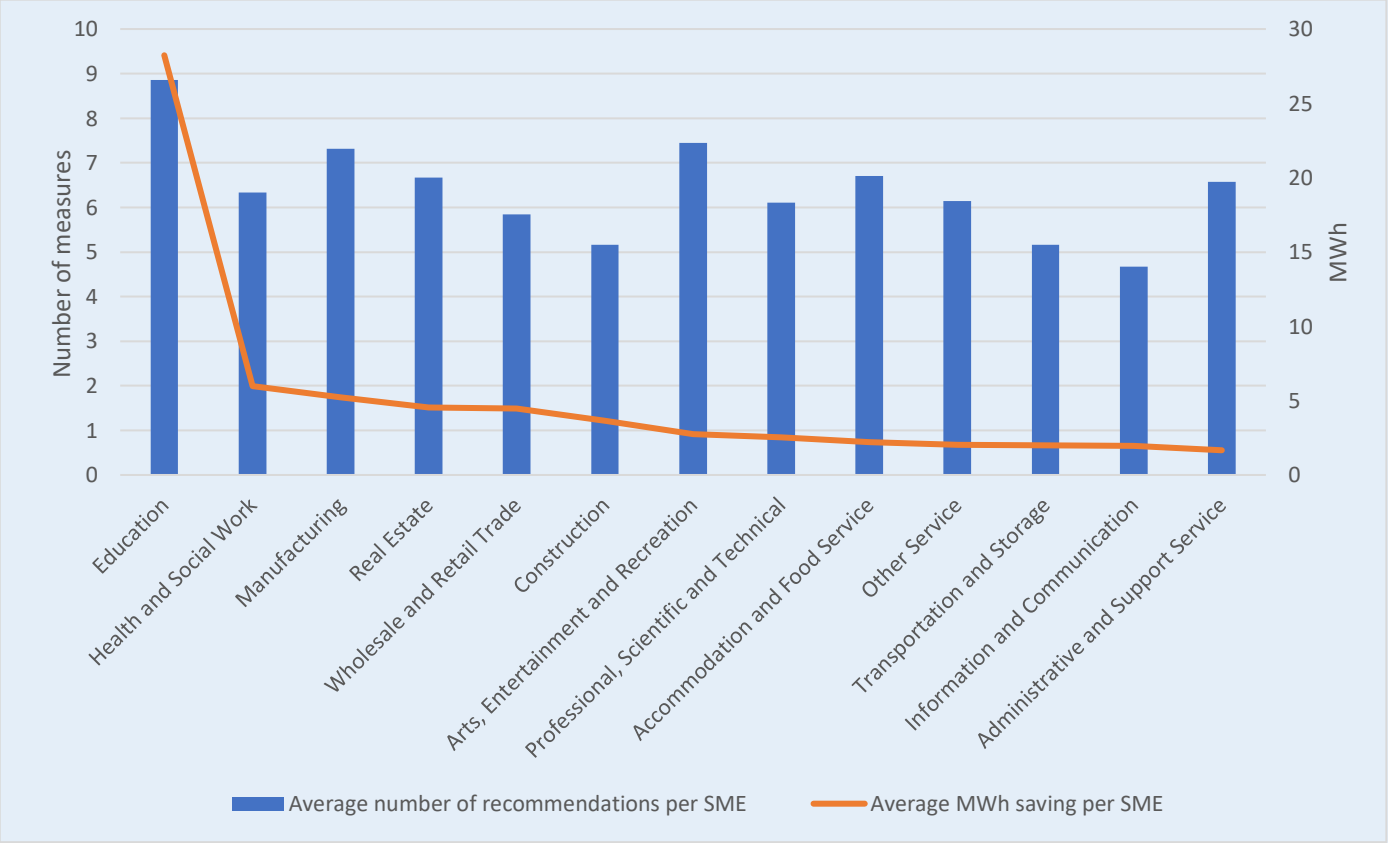
A total of 64 grant applications were submitted for energy efficiency projects. Two of these were rejected by the grant panel. Eight SMEs dropped out of the project after having their applications approved. Reasons for this included businesses deciding not to go ahead with the investments due to cashflow constraints, because other sources of funding became unavailable, or the sale of a building. One beneficiary was deemed ineligible for grant funding after the panel had accepted the application, while in another case the specific investment (work on the frontage of a retail premises) was deemed ineligible for ERDF support. In several cases, the grant claimed by SMEs was less than the amount initially awarded by the panel. In response, and in order to maximise the use of ERDF funding, the OxFutures panel put significant effort into contacting beneficiaries and confirming their spending plans in order to reallocate funds to future applicants.

Energy Efficiency Audits and Grants - Outcomes and Impact

Energy recommendations and actions

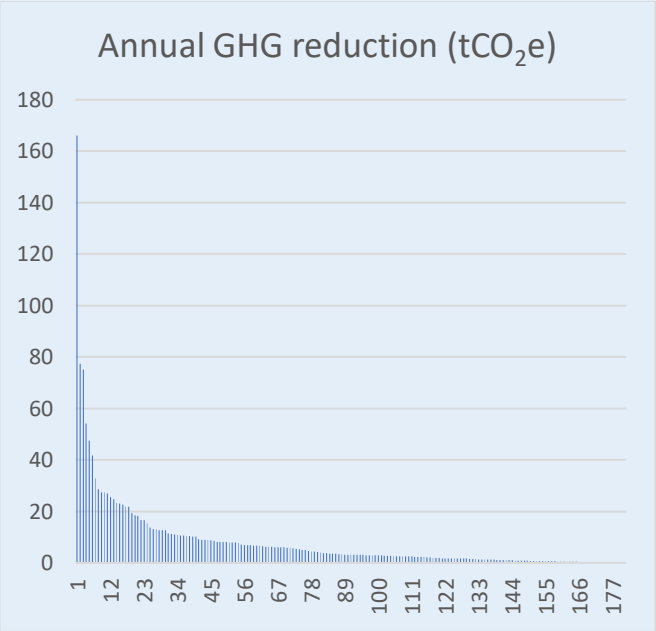
A total of 1170 recommended measures were provided to beneficiaries, amounting to an average annual energy saving of over 31,000kWh per SME, if implemented in full. At the rate of the current Energy Price Guarantee (34p/kWh), this would equate to over £10,000 savings per business per year. The number of recommendations ranged from 3 to 14, although this was not correlated with projected savings. In the case of SMEs with large energy usage, just a few recommended measures could amount to over 10,000kWh of annual savings.

The chart below breaks down the number of recommended measures and the potential savings (in MWh) for each sector. On average, just under 9 recommendations were made to SMEs in the Education sector, and these were associated with the largest savings too: nearly 30,000kWh per business.

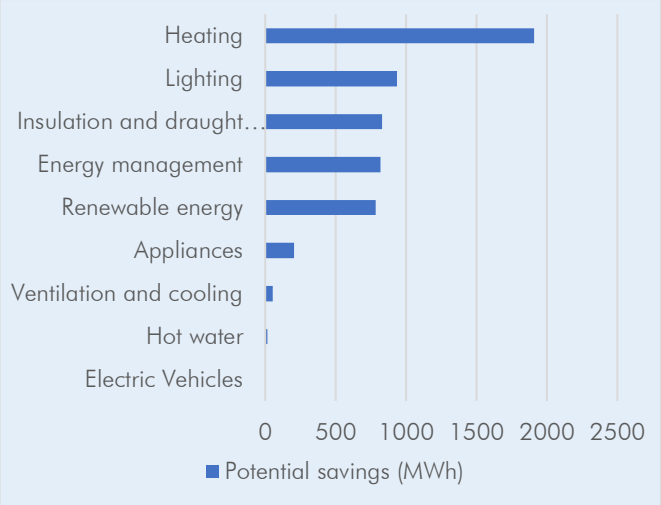


This reflects the fact that several Oxford Colleges with significant energy usage were audited.

The chart above indicates that the Pareto Principle applies to the recommendations. The 10 SMEs with the potential to achieve the largest reductions in annual Greenhouse Gas (GHG) emissions represented 39% of the total potential (578 tCO2e).

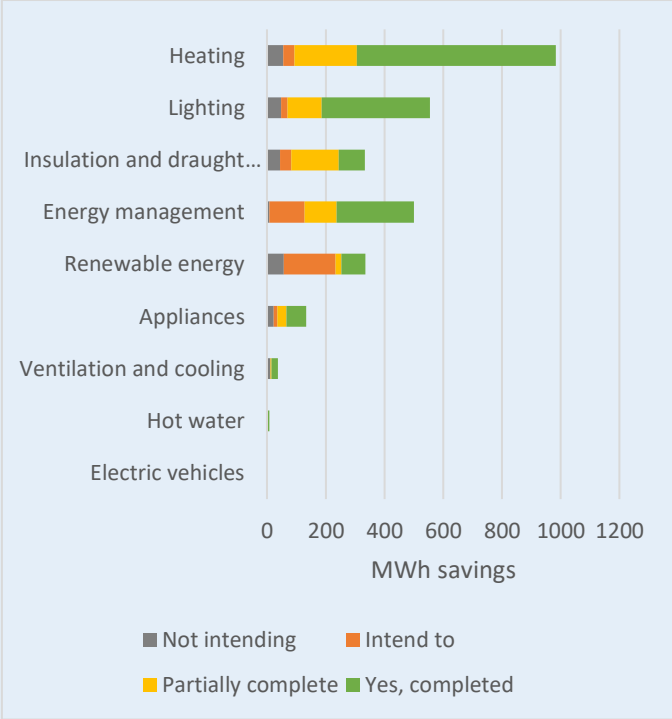


The chart below breaks down potential savings by type of measure. Given that space heating represents the bulk of energy usage in buildings, heating-related measures had the greatest savings potential across the whole cohort.



EiE have been monitoring the implementation of energy efficiency measures amongst all SMEs receiving audits and grants using surveys and telephone feedback. Responses were received for 507 of the measures. Of these, 44% were reported as having been completed and 17% partially completed. Of the remaining measures, more than half of SMEs said they 'intended to' carry them out. For only 15% of the measures did businesses say they had no intention to carry them out.

The chart below breaks down these results by type of measure.

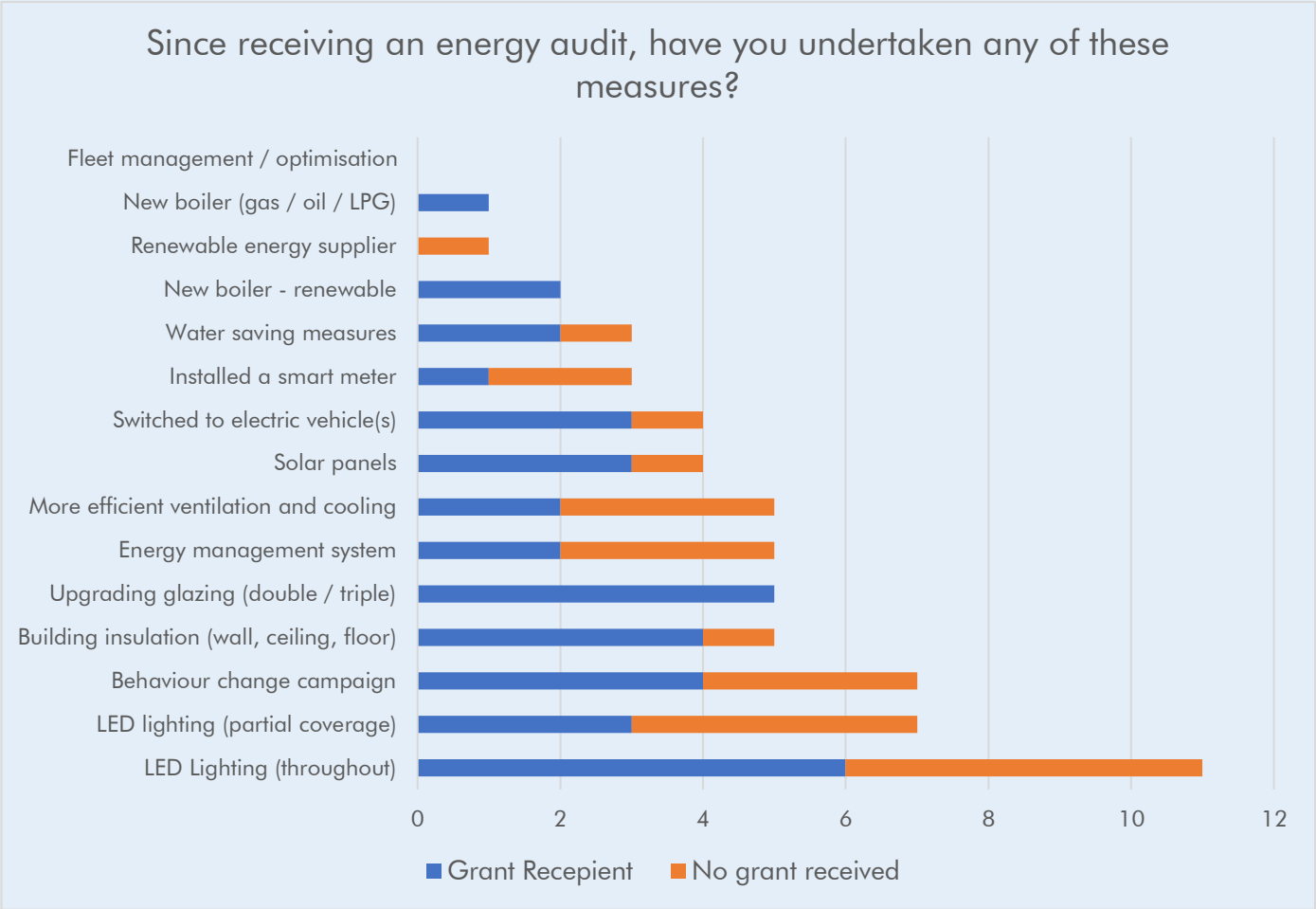


Comparing this with the previous graph: of the recommended measures, heating, lighting and energy management measures have proven the most popular. Notably, there is very low resistance to implementing energy management measures, perhaps due to the lack of need for capital investment in many cases.

SME Beneficiary survey

A survey was issued in October 2022 to the 136 SMEs receiving energy audits as part of phase 1 of OxFutures. The survey was not sent to those receiving audits as part of the extension to avoid 'survey fatigue': the priority was for beneficiaries to respond to EiE's requests for feedback so that GHG savings could be calculated.

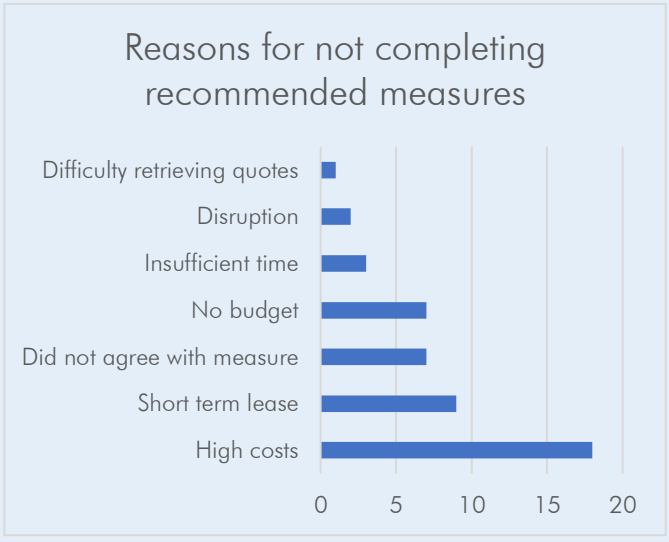
23 responses were received. This relatively low response rate can be partly explained by the time elapsed between the audit visit and the survey request, which in some cases was five years. Indeed,



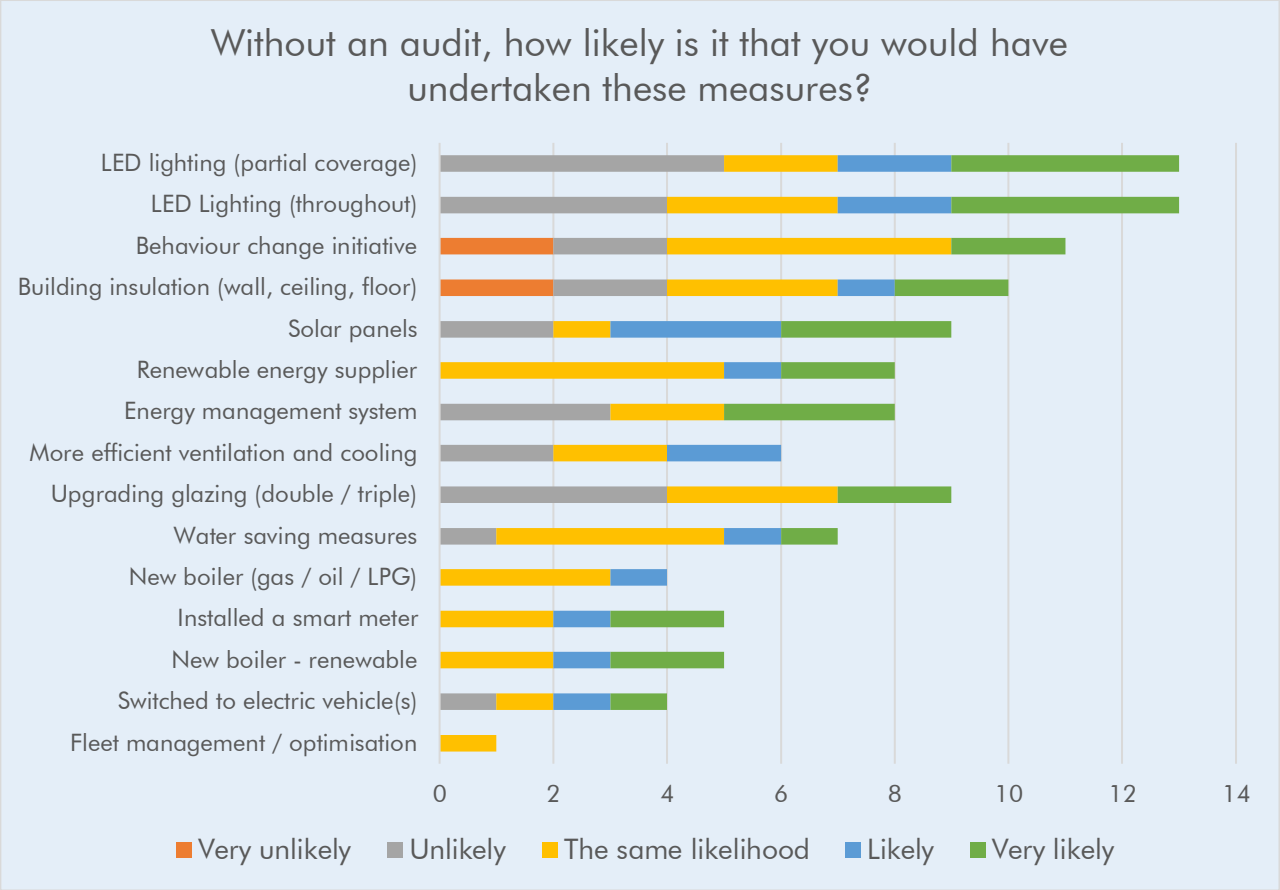
a large number of email requests bounced back due to staff turnover, or in several cases, business closure during the pandemic. Another explanation is that some SMEs have since become clients of Energy Solutions Oxfordshire (ESOx), the spin-off energy services company hosted by the Low Carbon Hub. ESOx clients had recently been surveyed (September 2022), and several OxFutures beneficiaries chose not to respond to *both* surveys.

Of those responding, 50% had gone on to successfully apply for a grant to support energy efficiency measures. The chart above shows the rate of installation of different energy efficiency measures since receiving an audit. As expected, those receiving grants had installed more measures on average (38/63), and were more likely to implement improvements to building fabric, such as upgrading glazing and installing insulation. The implementation of zero capital cost measures was more evenly spread: installing LEDs, energy management systems, and undertaking behaviour change initiatives were popular regardless of whether grants were awarded.

Survey respondents were asked about the likelihood of implementing measures if they had *not* received an energy audit. The chart overleaf shows significant variation between SMEs: roughly the same number of those installing LEDs said that they would likely have gone ahead *without* the audit as those who

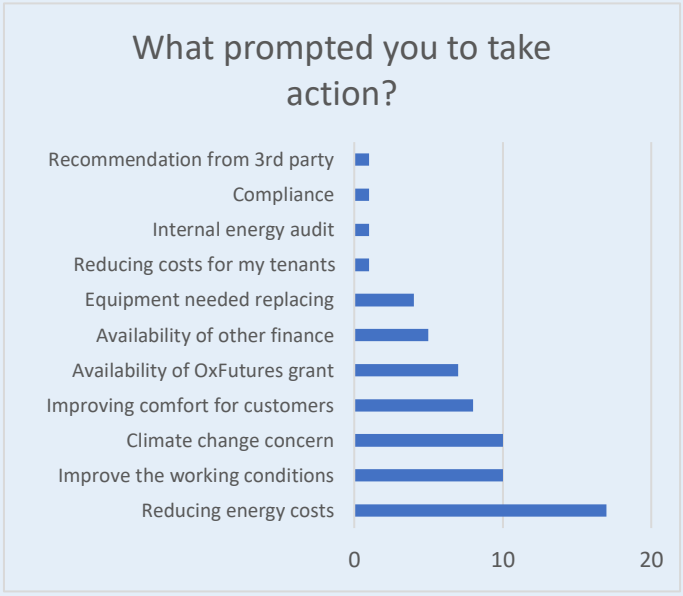


said it *had* instigated action. The same mixed pattern



can be seen for each of the other measures. This might be explained by the diversity of the cohort of beneficiaries, and the fact that grants were received by 50% of respondents.

Of those recommended measures which SMEs had *not* undertaken, the most commonly cited reasons were high costs, followed by uncertainty about premises due to having a short-term lease. SMEs were also asked about general barriers to implementation, and finance again emerged as the principal hindrance. Access to capital was the most reported general barrier (43%), followed by 'competing priorities' (27%) and short-term tenancy (13%). No SMEs selected the option 'not strategically aligned with our business mission'.



Finally, those SMEs which have implemented measures were asked what prompted action. Reducing energy costs was the most common response, no doubt influenced by extremely high prices at the time of the survey. However, the improving working conditions for staff, and comfort for customers were mentioned by 10 (50%) and 8 (40%) of those responding to this question, while 10 SMEs (50%) cited concern for climate change as a reason for taking action.

Verification visits and interviews

In addition to interviews, verification visits were conducted with businesses receiving grants for energy efficiency measures. These enabled more in-depth insights into the experiences of grant applicants, which often related to site-specific characteristics.

Case Study: Oxford River Cruises

Oxford River Cruises received an OxFutures grant from GreenFund to convert their fleet to electric propulsion

Oxford River Cruises have made significant progress on the conversion of their fleet to electric vessels as part of their effort to reduce their overall energy consumption. Benefitting from an OxFutures grant, Giles Dobson (owner of Oxford River Cruises) has been able to convert his third passenger boat to electric propulsion. Oxford River Cruises currently operates three passenger boats, two of these are 12 seat vessels and are already electrically powered.

"Converting our larger, 50 seat vessel, to electric propulsion was more challenging but the technology is now available to make it possible. We now have a fully electric fleet."

As well as the environmental benefits the change brought, customers also benefitted. Electric vessels can be easier to maintain, have much lower fuel costs and, due to their almost silent running, provide a greatly enhanced experience for passengers. It also removes any risk of diesel oil entering the water. The work involved removing the existing diesel engine and water jet drive and replacing it with a 20kw electric pod motor and a large bank of batteries.

Looking forward, Giles, who also owns The Folly Restaurant is always seeking new opportunities to improve and reduce the environmental impact of his two businesses. He has already taken action to reduce energy consumption, through the installation of an induction oven in the restaurant's commercial kitchen which was also part-funded by an OxFutures grant and are now reviewing at the sustainability of the food and drink they serve. They are currently working with a renewable energy electricity supplier and are seeking an environmental charity to partner with.

"I want my businesses to do everything possible to minimise their environmental impact, and, if we can, demonstrate the effectiveness of clean energy technologies to other boaters so that they have increased confidence in making the switch themselves."

Electric propulsion is considered the best option for use on the UK's inland waterways due to electric power working best at slow speeds, in low water flow and with long, thin vessels (e.g. a canal narrowboat). Additionally, the vessels are rarely far from shore and thus never too far away from an opportunity to recharge.

The electrification of the 50-seat vessel, the Serafina, will make it the largest electrically powered boat on the Thames and an example of what can be achieved in electric transportation.

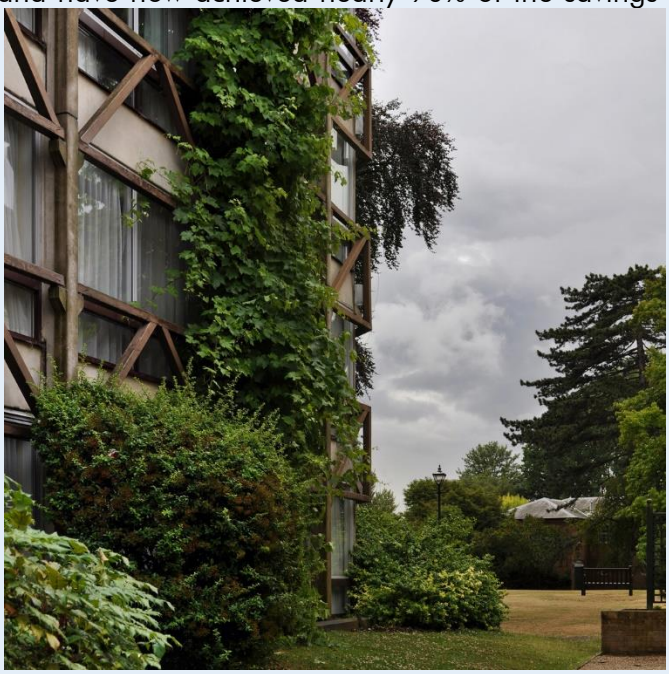
Dean Court Community Hall, for instance, needed to conduct repairs to their roof, and took the opportunity to install an array of solar panels, coupled with a lithium-ion battery at the same time. They closely monitor their data and were able to show that with the battery, their self-consumption of electricity increased from 26% in 2021-22, to 72% in 2022-23. Like many of the non-profit SMEs applying for grants from OxFutures, Dean Court had to be agile in combining several sources of finance in order to provide match-funding for the ERDF grant. They relied on skilled and experienced volunteers to handle the grant process.

St Hilda's College consumes a large amount of energy on their site which includes accommodation, offices, and conference facilities. The audit report had proven valuable to their College Surveyor, who had been working through the recommendations for several years at the time of my visit (October 2021). However, during this visit it emerged that there had been some confusion about the distinction between OxFutures, ESOx and the Low Carbon Hub's other services, and they were not aware that a grant was available. Happily, they subsequently applied for a grant which was used to upgrade windows on-site.

People, Place & Participation is an SME which runs Flo's Oxford: a community hub located in East Oxford. They received a grant to install solar panels, and estimate savings of nearly £4,000 per year which will be reinvested in community activities including tackling food poverty and providing sustainability workshops and talks. This is an example of how the OxFutures grant had a multiplier effect for sustainable business activity.

Hill End Education Centre received a grant to upgrade the glazing on one of their dormitory buildings

Nicholson's Nurseries explained that they are fully committed to tackling climate change as a business, which was the principal motivation for taking action to reduce energy usage. The audit report highlighted the need to collect data on usage for their different buildings, and Nicholson's have been working to resolve this recently, having encountered problems with accessing meters: a barrier that hinders progress for many SMEs. Nicholson's estimate that they have saved nearly 3 tonnes of CO_2e per year and have now achieved nearly 90% of the savings potential outlined in EiE's audit report.



St Hilda's College have implemented almost all EiE's recommendations, and received a grant to upgrade windows.

Hill End is an educational centre with onsite accommodation just outside Oxford. They received a grant to install double glazing in their middle dormitory but have also been able to act on several other efficiency recommendations such as installing LED lighting and loft insulation, drawing on other charitable grants. They have not got access to energy monitoring data so were unable to evaluate how much energy they are saving as a result of the measures, but agreed that EiE's estimate of £350 annual savings was reasonable (based on Jan' 21 prices).

Sylva is an environmental charity in South Oxfordshire. They have had a frustrating experience of trying to implement pro-environmental measures. They were approved for a grant to install electric vehicle charging points, but were subsequently informed by the electricity grid operator that they could not go ahead due to local constraints. They have also struggled to raise capital to fund the installation of a solar array on their newly renovated building, and have been hoping that the Low Carbon Hub would consider their site for a community investment opportunity.

Value for Money

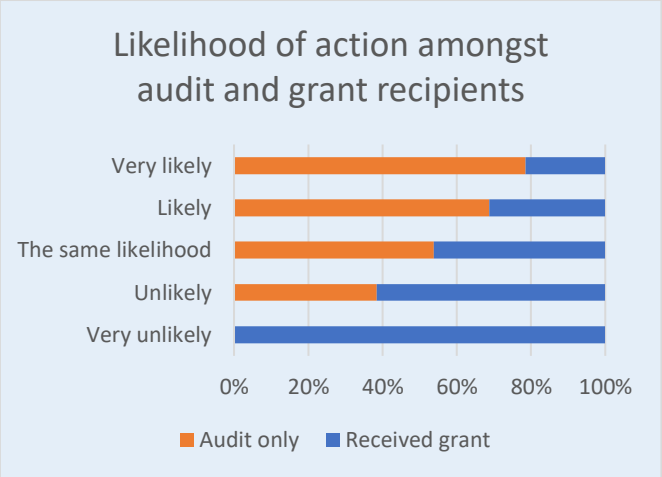
Some ERDF projects focused on energy efficiency in SMEs choose a light-touch approach to providing advice on which energy saving measures are best suited to them. Simple online tools or self-audit guides are designed to give SMEs the information necessary to decide which technology or system to pursue, with the help of a match-funded grant. The advantage of this approach is that a greater proportion of the available ERDF funds can be allocated to grants for the implementation of energy saving measures.

OxFutures adopts a different approach, where significant emphasis is placed on energy audits provided by experienced, specialist advisors. Evidence from surveys, interview and verification visits indicates this is a good use of ERDF funds. SMEs value the expertise behind their audit reports, and these documents provide assistance over a long period of time as businesses work through the recommendations as and when opportunity arises (e.g. having access to capital, or during moments of disruption such as refurbishments). They report high levels of trust in EiE and the Low Carbon Hub, and many have established long term relationships with these project partners, either becoming members of LCH CIC, or taking part in other initiatives such as Energy Solutions Oxfordshire.

Counter-factual analysis

There are several ways to conduct counter-factual analysis with regards OxFutures' energy efficiency audits and grants.

Firstly, SMEs were asked in our survey whether they would have gone ahead with measures without ERDF support. As shown above, this attracted a range of responses. However, the chart below shows that those receiving grants were much less likely to have gone ahead with the measures without OxFutures support, compared with those receiving audits only. This indicates that the provision of grants instigates *additional* energy efficiency activity amongst SMEs. The analysis above (top of p34) also provides a breakdown of the type of measures likely to be undertaken by those not receiving grants: lower cost and zero capital.



Secondly, a survey was issued to those SMEs who had applied for OxFutures support but were either deemed ineligible, or whose applications were rejected. Only three responses were received, and of these, one had received an external energy audit, while another had conducted their own. Nonetheless, together they reported having implemented 10 measures in the last three years. Two SMEs had replaced lighting with LEDs throughout their premises, while two reported installing solar panels. In fact, the average of 3.3 measures installed per SME is very similar to the rate reported by the 20 SMEs having received OxFutures responding to the same question. Those 20 reported a total of 63 measures implemented over three years (3.15 measures on average). This counter-factual evidence indicates that the 'background' rate of energy efficiency activity may be equally high compared with OxFutures beneficiaries. However, the small sample prevents any definitive conclusion, and besides, these were not three 'average' businesses, but those who had expressed an interest in the project.

Finally, it is useful to examine wider trends amongst UK SMEs on energy efficiency. In 2021, the British

Business Bank (BBB) conducted a nationally representative survey of 1,200 SMEs.

Their survey found that only 6% of SMEs have measured their **carbon footprint** in the last five years. This is consistent with another survey conducted by O2 and the British Chambers of Commerce which found that 11% measure their GHG emissions annually. Of those in the BBB survey who did so, 52% have also set **targets**. Comparing these figures with the OxFutures survey suggests that the Oxfordshire cohort is significantly more engaged with climate action. Although our survey did not ask about footprints, 29% of OxFutures SMEs reported having set environmental targets, for which a baseline footprint is usually required.

In the BBB survey, 78% of businesses reported having **taken at least one action** on energy efficiency, although a time-period is not specified. In our survey of OxFutures clients, 87% had implemented at least one measure, and the average number of measures implemented over three years was just over three.

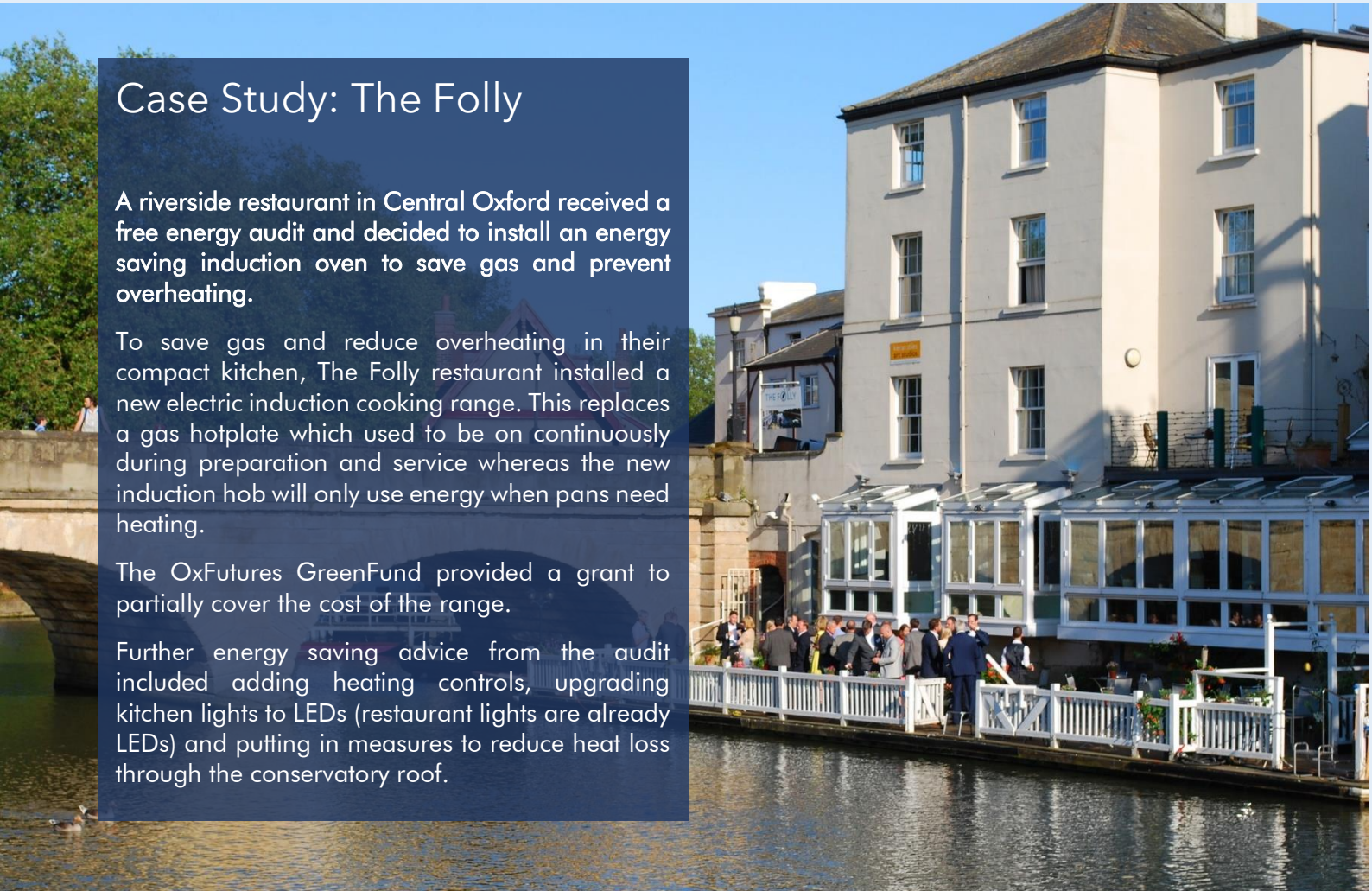
52% of OxFutures SMEs reported an **intention** to install further energy efficiency measures in the next 12 months. This compares to 59% of businesses expressing this intention in the BBB survey, indicating perhaps that many of the OxFutures SMEs have *already* completed their energy saving plans.

Motivations for taking action are similar amongst OxFutures SMEs and the broader population. 50% of OxFutures clients cited concern for climate change as a driver for action, while 43% of UK SMEs indicate that being a low-carbon business was a high priority.

There were some key differences between **barriers** reported in the two surveys. 21% of BBB respondents said that upfront cost was a key barrier to action, while 65% of OxFutures SMEs reported this. Conversely, 10% of UK SMEs considered a lack of information to be a barrier, but only 1/20 OxFutures SME selected this. This lower rate is likely due to having received an audit report with tailored information.

Overall, this comprehensive assessment of the OxFutures energy audits and grants workstream demonstrates sound project management and implementation practices, underpinning the delivery of energy efficiency services which offer significant value for money and additionality to Oxfordshire SMEs.

The Folly Restaurant received a grant to help them purchase an induction stove to reduce their use of gas



Case Study: The Folly

A riverside restaurant in Central Oxford received a free energy audit and decided to install an energy saving induction oven to save gas and prevent overheating.

To save gas and reduce overheating in their compact kitchen, The Folly restaurant installed a new electric induction cooking range. This replaces a gas hotplate which used to be on continuously during preparation and service whereas the new induction hob will only use energy when pans need heating.

The OxFutures GreenFund provided a grant to partially cover the cost of the range.

Further energy saving advice from the audit included adding heating controls, upgrading kitchen lights to LEDs (restaurant lights are already LEDs) and putting in measures to reduce heat loss through the conservatory roof.

Part 4 - Conclusions and lessons learned

OxFutures has played a significant role in accelerating the low carbon transition in Oxfordshire.

The project has performed well against its original objectives. Through its Greenlab workstream, it built strong links between the SME and research communities with regards energy innovation, helping to build the foundations for Project LEO and other investments. It directly supported SMEs to develop and commercialise low carbon products and services through its Greenfund Innovation programme; and it helped 181 SMEs to overcome barriers to the uptake of energy efficiency measures. The launch and subsequent independence of Oxfordshire Greentech is another example of project legacy.

Extensive evidence gathered with respect to each of the work packages indicates effective project management and delivery. Compared with many similar ERDF projects, OxFutures had a wide remit and involved a diverse consortium of partners. These brought a broad range of skillsets to the project which ensured effective delivery across the work packages, and had the added benefit of forging strong and lasting working relationships between the local authorities, university, charity and business partners.

Recommendations

The interim Summative Assessment provided a set of recommendations for the OxFutures team which were successfully implemented. This included leveraging the evaluation as an opportunity for formative feedback and longitudinal analysis.

One of the most significant challenges for any publicly funded SME support project is to create a sustainable model for continued activity. OxFutures has been planning for and building its legacy from its inception, and proof of its success is easy to find: the launch of Energy Solutions Oxfordshire, Oxfordshire Greentech and Project LEO were each directly attributable to OxFutures. Another example is that in Oxfordshire's Net Zero Action Plan, expanding LCH and EiE's provision of energy efficiency support for SMEs is cited as one of the key priority actions for the county.

As such, there are few recommendations that can be provided to the partners at the end of the five-year project. Nonetheless, there is a clear need to scale-up the activities involved in OxFutures in order to accelerate the energy transition and keep Oxfordshire on track to meet its climate goals.

…for project partners:

- Seek opportunities to reach more SMEs in Oxfordshire with energy audits and support for implementation, including through publicly funds such as the Shared Prosperity Fund.
- Seek opportunities to continue building a coalition of partners which represent the public, private, university and charitable sectors.
- Consider publishing the outcomes and experiences of providing support for SMEs on climate change: this remains an under-researched area, and lessons from OxFutures have international significance.

…. for similar projects

- OxFutures is an exemplary project in terms of its project management, impact on SME beneficiaries, and long-term legacy. This Summative Assessment may prove valuable to other projects and initiatives seeking an example of effective project delivery and value for money.
- The Greenlab and Greentech work packages are untypical of ERDF projects, but demonstrate the benefits of including diverse activities to help resolve multiple challenges involved in the SME energy transition.

… for policymakers

- SMEs continue to face significant barriers to implementing energy efficiency opportunities. With energy prices extremely high at present, energy bills are threatening the financial sustainability of many. With ERDF funding ending, it is essential that government replaces this funding stream with similar initiatives to accelerate energy savings amongst SMEs. The high cost to the

taxpayer of the Energy Price Guarantee could be offset with comparatively small investments in grants and other support for energy efficiency.

- It is well known that ERDF funding (as implemented in the UK) is excessively bureaucratic, and this was found to affect several SME beneficiaries and make project delivery challenging for the LCH team. For future funding streams targeting SMEs, policymakers should consider relaxing some of the exclusion criteria (e.g. retail businesses), and developing a streamlined claims process.

About the author

Sam Hampton combines his work as an independent sustainability consultant with a position as a Researcher at the Environmental Change Institute, University of Oxford, and as a Research Fellow at the University of Bath. He specialises in energy demand, SMEs and behaviour change. Although Oxford University is an OxFutures partner, Sam had no official involvement with the project prior to conducting this evaluation.

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