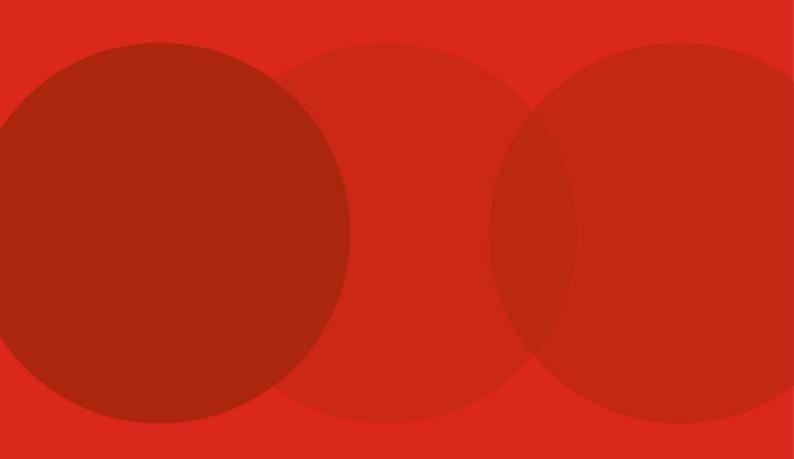
Oxfordshire Strategic Economic Plan

Deep Dive Report: Net Zero and Sustainability

A Report to Oxfordshire LEP









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Preface

In January 2023, Oxfordshire Local Enterprise Partnership (OxLEP) commissioned SQW – working with Oxford Brookes Business School and glass.ai – to prepare a refreshed **Strategic Economic Plan** for Oxfordshire.

To support the development of the Strategic Economic Plan, an **Independent Economic Review** was completed. As well as taking a fresh look at the county's economic data and bringing together a wide range of existing evidence, the Review focused on four key questions, each of which has transformational, long-term implications for Oxfordshire's economy:

- How do we enable progression within Oxfordshire and achieve more inclusive economic growth?
- How do we advance Net Zero and sustainability in shaping future economic growth?
- How do we secure the future of the 'foundational economy' within Oxfordshire?
- Recognising Oxfordshire's world class strengths, how do we accelerate innovation and diffusion – both within Oxfordshire and across the UK?

This topic paper considers the second of these questions, looking in detail at **net zero and sustainability**, and the links to Oxfordshire's economy.





1. Our starting point for the Deep Dive

Introduction

- 1.1 While sustainability is not a new issue, as the noticeable effects of climate change increase, concern and interest in how we can reduce and mitigate our impact on the environment also increases. While climate change is not the only sustainability challenge, it remains a central concern. The main cause of climate change is emissions into the atmosphere.
- 1.2 This 'Deep Dive' considers many aspects of sustainability, but it has a particular focus on carbon emissions related to Net Zero. Furthermore, as this Deep Dive is designed to inform OxLEP's new SEP, the report looks at the implications of Net Zero and Sustainability as it interacts with the local economy in particular. There are many existing documents that speak to sustainability in Oxfordshire in a powerful way. Our report does not duplicate that work; rather it uses them to draw out the key implications for the new SEP. It is critical that net zero and sustainability are at the fore in the new SEP, but it is also important to consider the ways in which these might act as constraining factors in other areas.

Definitions – and why it matters

- 1.3 Political, social and economic drivers to increase sustainability in the economy are growing. From international organisations, through national governments to local councils, achieving Net Zero is becoming imperative. The UK signed the Paris agreement in 2015, and therefore has agreed to limit global warming to a maximum of 2 degrees Celsius above pre-industrial levels but ideally, 1.5 degrees Celsius.¹
- 1.4 Greenhouse gases contribute to climate change, which in turn causes extreme weather, undermines our natural ecosystems, and creates uncertainty around the future. While there are some debates around the definitions of Net Zero, typically it refers to targets around the reduction and offsetting of greenhouse gases by a set date. It is widely thought that eradication of all greenhouse gas emissions will not be possible, and as such the aim is to minimise emissions and offset those that cannot be eradicated. To achieve this, the UK Government has set the target of achieving Net Zero in carbon emissions by 2050 through the enactment of the Climate Change Act.²
- 1.5 While there has been some success in decoupling economic growth from greenhouse gas emissions and emissions have been decreasing since global Net Zero targets were set, there is still much work to be done to achieve these targets. However, reducing carbon emissions

² ibid





 $^{^1 \} Climate \ Action \ Plan \ for \ South \ Oxfordshire \ District \ Council, 2022-2024 \ Available: \\ \underline{https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2022/02/South-Climate-Action-plan-2022-2024.pdf}$

also brings about business opportunities with the low carbon economy likely to grow by 11 percent per year to $2030.^3$

How is it already being addressed?

- 1.6 Within Oxfordshire, the political and public support for sustainability and achieving Net Zero is strong. All district/city councils and the county council have created Net Zero targets which can be seen in Table 1-1. Some of these targets are ahead of the UK Government targets as people within the county have shown a desire to take the lead on Net Zero.⁴
- 1.7 In 2021, as a result of the strong political and public support, a series of strategic documents were published, outlining the scenarios, roadmaps and plans for achieving Net Zero in Oxfordshire by 2040. These included in particular the Pathways to a Zero Oxfordshire report (PAZCO), the Zero Carbon Oxford Partnership report (ZCOP) and the Future Oxfordshire Partnership's strategic vision.

Table 1-1: Commitments to Net Zero in Oxfordshire

Council	Target/Progress
Oxford City	Zero Carbon Oxford is the goal for Oxford City to achieve zero carbon emissions across the city as a whole by the year 2040. ⁵ Oxford City has committed to reducing carbon emissions and becoming a Zero Carbon Council by 2030. ⁶
South Oxfordshire	South Oxfordshire District Council declared a climate emergency in April 2019, and in April 2021 declared an ecological emergency. As a result of these declarations, it has set out targets to be carbon neutral within its own operations by 2025, and to be a carbon neutral district by 2030. ⁷
Vale of White Horse	Vale of White Horse District Council declared a climate emergency in February 2019. It committed to be carbon neutral within its own operations by 2030, with an aim for a 75 per cent reduction in carbon emissions in operations by 2025, The Vale of White Horse District Council has also committed to be a carbon neutral district by 2045, with a 75 per cent reduction in carbon emissions in the district by 2030.8
Cherwell	Cherwell District Council has declared a climate emergency, and will ensure its operations and activities are Net Zero by 2030. It has also

³ The Oxfordshire Energy Strategy Available:

⁸ Climate Action Plan for Vale of White Horse District Council, 2022-2024 Available: https://www.whitehorsedc.gov.uk/wp-content/uploads/sites/3/2022/02/Vale-Climate-Action-plan-2022-2024.pdf





https://www.oxfordshirelep.com/sites/default/files/uploads/Oxfordshire%20Energy%20Strategy.pdf

⁴ Sam Hampton, Lewis Knight, Hannah Scott, Hannah Budnitz, Gavin Killip, Scot Wheeler, Alison Smith and Nick Eyre Pathways to a Zero Carbon Oxfordshire, 2021, Available: https://www.eci.ox.ac.uk/publications/downloads/PazCo-final.pdf
⁵ Zero Carbon Oxford Partnership, Oxford City Council

https://www.oxford.gov.uk/info/20011/environment/1486/oxford to zero/3

⁶ Zero Carbon Council, Oxford City Council https://www.oxford.gov.uk/info/20011/environment/1486/oxford to zero/2

⁷ Climate Action Plan for South Oxfordshire District Council, 2022-2024 Available: https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2022/02/South-Climate-Action-plan-2022-2024.pdf

Council	Target/Progress
	committed to achieve a Net Zero carbon district by 2030. Since 2008/09 Cherwell has reduced carbon emissions by just over 49 per cent. In 2020/21 Cherwell District Council's annual emissions were down 22 per cent to 3220 tonnes of CO2e.
West Oxfordshire	West Oxfordshire District Council has declared a climate and ecological emergency and made a pledge to become a carbon-neutral council by 2030.9 The Council has committed West Oxfordshire to becoming a Net Zero district by 2050.10

1.8 While public and political support are strong, and this can be seen in the policy targets set out above, sustainability and achieving Net Zero are system wide challenges that cut across policy domains. This can be seen in the wide range of policies in which sustainability and Net Zero play a central role as shown in Table 1-2. Net Zero and sustainability as a cross cutting issue then becomes a key defining factor in any decision making process, particularly when looking at growth in other areas. Table 1-2 explores the ways in which sustainability and Net Zero shape central policy documents and demonstrate how Oxfordshire is already working towards sustainability and Net Zero.

Table 1-2: Net Zero and Sustainability as represented in key policy documents

Policy/Strategy Document	Summary
PAZCO	The PAZCO sets out a series of scenarios looking at meeting Net Zero by 2050 or sooner. These are based on steady progression, societal transformation, technological transformation and Oxfordshire leading the way. The scenarios include consideration of how to catalyse low carbon innovation in the region, alongside transport, energy, the built environment, as well as land use and sequestration. It considers the progress to date and makes recommendations for the future of a Net Zero Oxfordshire.
Zero Carbon Oxford Partnership Report	The Zero Carbon Oxford Partnership (ZCOP) released a report in July 2021 modelling a series of scenarios and roadmaps for Oxford City in particular, to reach Net Zero by 2040. It identifies the near, medium and long term action required for Oxford to meet its Net Zero target. The roadmaps focus on five key sectors in Oxford: (1) domestic, (2) commercial, (3) industrial, (4) institutional, and (5) transport. There is an action plan included which provides direction and steps towards Net Zero.
Oxfordshire Energy Strategy	Oxford Energy Strategy sets out the vision "For Oxfordshire to be at the forefront of energy innovation to foster clean growth" (p.6). It sets out objectives to increase the electricity grid capacity, to support ambitious

⁹ Climate Action and What we are doing, West Oxfordshire District Council

https://www.westoxon.gov.uk/environment/climate-action/climate-action-and-what-we-are-doing/

¹⁰ Sam Hampton, Lewis Knight, Hannah Scott, Hannah Budnitz, Gavin Killip, Scot Wheeler, Alison Smith and Nick Eyre Pathways to a Zero Carbon Oxfordshire, 2021, Available: https://www.eci.ox.ac.uk/publications/downloads/PazCo-final.pdf





Policy/Strategy Document	Summary
	and innovative clean generation projects across Oxfordshire as well as projects that reduce energy demand and increase efficiency. They set out an aim to increase and enhance collaboration and networking in the low carbon energy sector in the region.
Oxfordshire Infrastructure Strategy (OxIS)	The OxIS report identifies 5 sub-themes, Environment, Health, Place-Shaping, Connectivity and Productivity. These sub-themes are used to understand and assess Oxfordshire's future infrastructure investment to 2040 and underpin the needs-based appraisal component of the infrastructure scheme multi-criteria appraisal. The subtheme on the environment states the need to consider Net Zero carbon emissions, and strongly represents sustainability themes throughout. However, sustainability also relates to the subthemes on health issues such as clean air, place shaping through transport and connectivity through clean energy and sustainable transport.
Oxfordshire Food Strategy (OFS)	The OFS acknowledges the connections between Oxfordshire's food system and the challenges of health and wellbeing, climate change and biodiversity loss. The OFS highlights the importance of net zero goals being supported through sustainable food production and the reduction of food miles both at home and in institutional settings.
Oxfordshire Transport and Connectivity Strategy (OTCS)	The LTCP outlines a clear vision to deliver a net-zero Oxfordshire transport and travel system that enables the county to thrive whilst protecting the environment and making Oxfordshire a better place to live. The plan to achieve net-zero is by reducing the need to travel, discouraging individual private vehicle journeys and making walking, cycling, public and shared transport the natural first choice. There are 54 policy areas included in the LTCP, which can be considered the tools to achieving net zero transport systems in Oxfordshire. The LTCP will be delivered in a number of ways, including the delivery of physical infrastructure and services, influencing development, changes to the council's decision making processes and incorporation with other highway works.
Future Oxfordshire Partnership Strategic Vision	At the core of this Vision are principles of sustainable development. The Vision is supported by nine objectives (and eleven accompanying guiding principles). Several are concerned with the environment – whether the built environment, the natural environment or imperatives linked to resource use or carbon neutrality. In addition, some of the objectives are economic in focus. Some are predominantly social and/or focused on communities or places within Oxfordshire; and wellbeing is implicit throughout.
Oxfordshire Local Nature Recovery Strategy (forthcoming)	Work is underway to define priority species and habitats for Oxfordshire as well as what actions need to be taken to support them. This will result in a set of priorities, developed from consultation with local people, to create a strategy that will protect, enhance, and restore nature.





2. Understanding Net Zero and sustainability in Oxfordshire

Headlines

2.1 Within Oxfordshire there are 'distinctive flavours' (as consultees put it) to the green economy and how organisations are responding to Net Zero. Consultees and evidence submitted through the Call for Evidence linked to the SEP suggested that Oxfordshire could lead the way in sustainability, and that there is a desire to do so. There was also a recognition that there are some barriers to achieving this. Recent public and political debate on environmental issues has intensified around the low traffic neighbourhoods in Oxford, and programmes of construction/development in surrounding areas. We describe the frequently cited 'flavours' before outlining the challenges and opportunities in Oxfordshire in Chapter 3.

Innovation

- **2.2** Oxfordshire has a world class innovation economy, and from a green technology perspective the region is also leading the way. For example:
 - Two national energy systems demonstrators (Project LEO and the Energy Superhub) are located in Oxfordshire, alongside the Innovation Hub (iHub) which has a healthy array of Net Zero related projects (including those related to electric vehicles, green fuel and smart cycling).¹¹
 - The University of Oxford's work with The Energy Systems Accelerator (TESA) as well as subsequent projects building on its work (including ETHOS looking at combustion engineering) is complemented by the 200 senior academics working on low carbon energy with more posts to come.
 - Oxford Brookes University is leading by example through its pioneering geoexchange heating technology which is the first of its kind to be fitted in a UK campus.¹² Furthermore, the Oxford Institute for Sustainable Development at Oxford Brookes University is involved in developing new technologies, influencing policy and changing behaviours on a global level, bringing international learning to the Oxfordshire area.¹³
- **2.3** Investment into bringing together academics and industry such as the TESA allow for increased co-creation to address sustainability issues across what can be siloed sectors. However, support to increase these initiatives' reach into all relevant parts of the economy is

 $[\]underline{https://www.brookes.ac.uk/research/units/tde/institutes/oxford-institute-for-sustainable-development-oisd/linearch/units/tde/institutes/oxford-institute-for-sustainable-development-oisd/linearch/units/tde/institutes/oxford-institute-for-sustainable-development-oisd/linearch/units/tde/institutes/oxford-institute-for-sustainable-development-oisd/linearch/units/tde/institutes/oxford-institute-for-sustainable-development-oisd/linearch/units/tde/institutes/oxford-institute-for-sustainable-development-oisd/linearch/units/tde/institutes/oxford-institute-for-sustainable-development-oisd/linearch/units/tde/institutes/oxford-institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/tde/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/institute-for-sustainable-development-oisd/linearch/units/de/instit$





¹¹ Sam Hampton, Lewis Knight, Hannah Scott, Hannah Budnitz, Gavin Killip, Scot Wheeler, Alison Smith and Nick Eyre Pathways to a Zero Carbon Oxfordshire, 2021, Available: https://www.eci.ox.ac.uk/publications/downloads/PazCo-final.pdf

 $^{^{12}} Ox ford Brookes' green credentials recognised with shortlistings for two national awards, Ox ford Brookes University, 2023 \\ \underline{https://www.brookes.ac.uk/about-brookes/news/2023/03/ox ford-brookes-green-credentials-recognised-with-s}$

¹³ Oxford Institute for Sustainable Development (OISD), Oxford Brookes University

needed. Evidence submitted suggests that the profile of projects like the TESA needs to be raised.

Skills

- 2.4 Alongside feeding new technologies into the innovation ecosystem, Oxfordshire's world leading academics also support the development of high level skills within the region. As a signatory of the *Principles of Responsible Management*, Oxford Brookes Business School is shaping business leaders with sustainability at their core. Through its involvement in activities such as the *Taming the Carbon Monsters* programmes and the *Small Business Sustainability Basics* programme (delivered in collaboration with Small Business Britain), Oxford Brookes is also participating in upskilling local small business owners. There are skills gaps around the degree level (Level 4+) and at the elementary role level in the green economy too. For example, when discussing the skills gaps in fusion, one consultee said that knowledge of fusion was not the critical factor; engineers and project managers who could quickly pick up fusion knowledge are what is needed.
- 2.5 From other evidence submitted, including *Pathways to a Zero Carbon Oxfordshire* ¹⁶, and conversations with consultees, skills to deploy new technologies in Oxfordshire were discussed. This is particularly important when considering retrofitting buildings (commercial and residential) to meet Net Zero targets. This skills gap is threefold: firstly there is a need for skilled installers, to be able to meet future market demand for retrofitting buildings, and secondly, there is a need for business advisors to understand the benefits, challenges and processes of retrofitting for commercial buildings. The need for specialist apprenticeship programmes in green skills (building on, for example the Abingdon & Witney College Green Construction Centre) was strongly supported through submitted evidence.
- 2.6 On a different front, there is also a recognised shortage of skilled, experienced biodiversity professionals in the UK. Again from the call for evidence, the point was made that "significant, immediate investment in the training of nature-based professionals is urgently required for Oxfordshire to fulfil its potential as a national front-runner in delivery of nature-based solutions".
- **2.7** OxLEP's Local Skills Report suggests that much of the low and intermediate skills for the green economy are within the system, and that existing engineering, construction and project management skills need to be transferred to 'green projects'. However, the skills report

¹⁶ Sam Hampton, Lewis Knight, Hannah Scott, Hannah Budnitz, Gavin Killip, Scot Wheeler, Alison Smith and Nick Eyre Pathways to a Zero Carbon Oxfordshire, 2021, Available: https://www.eci.ox.ac.uk/publications/downloads/PazCo-final.pdf





¹⁴ United Nations Principles for Responsible Management Education - Progress Report 2020-2022, Oxford Brookes Business School Available: https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sip-reports/Oxford-Brookes-PRME 2020-22 report-final.pdf

¹⁵ Local Skills Report and Plan, OxLEP, 2022, Available:

https://www.oxfordshirelep.com/sites/default/files/uploads/8724%20Local%20Skills%20Report%20%26%20Plan%20v2

identified higher level skills of degree and PhD students, who need to be trained in the concepts of sustainability.¹⁷

Community approaches

2.8 The importance of community approaches to the Net Zero challenge was identified strongly in submitted documents and in consultations as a key strength of Oxfordshire. Across all renewable energy options, for example, community owned energy was heralded as pioneering: from Ray Valley Solar, to Westmill Wind Farm, to Sandford Hydro Lock, community energy is flourishing in Oxfordshire. The Low Carbon Hub has been central to securing funding and facilitating new community energy projects. The Ray Valley Solar project has been suggested to be the largest community owned solar ground mount in the UK. Community approaches to renewable energy generation have the advantage of being able to access and raise different types of financial investment (such as community share offers), while building community support for large infrastructure projects.

Box 2-1 Examples of local networking groups

Notable established local networks and community-led initiatives in Oxfordshire include:

- Oxfordshire Greentech a local business network which started as a part of the OxFutures programme but is now its own legal entity, with a growing membership. It is closely connected to Cambridgeshire Cleantech, strengthening relationships across the Cambridge-Oxford Arc. ²⁰
- **Community Action Groups Oxfordshire** a network of over 100 community groups with interest in sustainability and equity.²¹
- **Zero Carbon Oxford Partnership** a group of leaders from Oxford's main institutions and employers working on reducing carbon emissions in the city. ²²
- Low Carbon Hub CIC comprising the Low Carbon Hub Industrial and Provident Society (Low Carbon Hub IPS) and the Low Carbon Hub Community Interest Company (Low Carbon Hub CIC) the CIC supports community action on climate change and the innovation.²³
- **People Planet Pint Oxford** an informal meetup for sustainability professionals in Oxford. It is part of a wider initiative organised by Small99.²⁴
- 2.9 Social innovation, alongside technological innovation, can provide societal transformations towards Net Zero under these conditions; as can be seen in the Project LEO and Low Carbon Hub Smart Fair Neighbourhood trails testing equitable energy services.²⁵ As discussed in one consultation, while community approaches are seen as a strength and third sector

²⁵ Sam Hampton, Lewis Knight, Hannah Scott, Hannah Budnitz, Gavin Killip, Scot Wheeler, Alison Smith and Nick Eyre Pathways to a Zero Carbon Oxfordshire, 2021, Available: https://www.eci.ox.ac.uk/publications/downloads/PazCo-final.pdf





¹⁷ Local Skills Report and Plan, 2022, OxLEP, Available:

 $[\]frac{https://www.oxfordshirelep.com/sites/default/files/uploads/8724\%20Local\%20Skills\%20Report\%20\%26\%20Plan\%20v2\%20final.pdf$

¹⁸ Low Carbon Hub https://www.lowcarbonhub.org/

¹⁹ Sam Hampton, Lewis Knight, Hannah Scott, Hannah Budnitz, Gavin Killip, Scot Wheeler, Alison Smith and Nick Eyre Pathways to a Zero Carbon Oxfordshire, 2021, Available: https://www.eci.ox.ac.uk/publications/downloads/PazCo-final.pdf

²⁰ Oxfordshire Greentech https://oxfordshiregreentech.co.uk/

²¹ Community Action Groups Oxfordshire https://www.cagoxfordshire.org.uk/

²² Zero Carbon Oxford https://www.oxford.gov.uk/info/20011/environment/1486/oxford to zero/3

²³ Low Carbon Hub https://www.lowcarbonhub.org/about/

²⁴ People Planet Pint, Small 99 https://small99.co.uk/people-planet-pint-sustainability-professionals-meetup/

organisations are often seen as a proxy for consultation,²⁶ their own ability to consult is often limited and therefore they should not be used as a proxy for public participation, but can facilitate wider access.

Box 2-2 Example of Networks outside of Oxford: PCAN

The Place Based Climate Action Network aims to translate public policy aims into concrete action. It brings together actors from across the third sector, private sector, public policy, and academia. Three of the commissions are geographically bounded: based in Leeds, Belfast and Glasgow. Two more are thematically based focussing in particular on finance and climate adaptation. Commissions are described as partnerships across sectors that help to connect actors in the local area to drive change, guide others, and track progress. They have been 'described as a new form of governance'. Typically they have an independent Chair and a Vice Chair (typically from a local council) with other members taking on leadership around other duties.²⁷

2.10 However, community organisations and other partnerships/initiatives often rely on short term funding, and this has led to projects and organisations building up momentum, only to have to wind down after funding falls short. It also limits the social capital people are willing to invest in these projects, as there is a perception that they are 'here today, gone tomorrow'. The reliability and stability of Net Zero support systems must be maintained and viewed from a long time perspective to maximise value. There is potential for creation of new projects which should be supported as the PAZCO suggests widespread support for community energy.²⁸ Furthermore, the opportunity to keep value from renewable energy in the area is improved if community approaches are used.

Sustainable food and farming

- **2.11** Oxfordshire has 192,754 ha under farmland, equating to 74% of Oxfordshire's land cover (NFU, 2014). Agriculture contributes £840 million to Oxfordshire's economy (Oxfordshire Food Strategy 2023). There are 1,650 agricultural enterprises in the county, which represents over 5% of total enterprises (OxLEP 2018). Agriculture is responsible for an estimated 10% of carbon emissions nationally (BEIS, 2019), a figure which is expected to be similar for Oxfordshire. Currently, only 1% of Oxfordshire's food is produced in Oxfordshire (Oxfordshire Food Strategy, 2023) but in the Oxfordshire Leading the Way scenario of the Pathways to Net Zero Carbon Oxfordshire report, this could be as high as 55% by 2050. The inference is that food and farming have an important contribution to make in this context. Many of these themes are picked up in the Oxfordshire Food Strategy.
- **2.12** However the sector as a whole is under some pressure particularly given the change in the systems of support for farming (following the end of the Common Agricultural Policy and the

²⁸ Sam Hampton, Lewis Knight, Hannah Scott, Hannah Budnitz, Gavin Killip, Scot Wheeler, Alison Smith and Nick Eyre Pathways to a Zero Carbon Oxfordshire, 2021, Available: https://www.eci.ox.ac.uk/publications/downloads/PazCo-final.pdf





²⁶ Micaela Mazzei, Simon Teasdale, Francesca Calò & Michael J. Roy (2020) Co-production and the third sector: conceptualising different approaches to service user involvement, Public Management Review, 22:9, 1265-1283, DOI: 10.1080/14719037.2019.1630135

²⁷What is a local climate commission, Place-based Climate Action Network https://pcancities.org.uk/what-local-climate-commission

introduction of Environmental Land Management schemes). However consultees also commented on the nature and range of innovative projects within the county. One example related to a dairy farm that had returned to on-farm bottling and resumed a 'milk run' that had been especially successful during and after the pandemic.

Natural capital and ecosystem services

- **2.13** In parallel, there is growing recognition of the importance and role of natural capital and ecosystem services in adapting to climate change and more generally. There are many different aspects of ecosystem services and these are relevant countywide. The rural dimensions are clear, but through green and blue infrastructure, nature also plays a critical role in the built environment (delivering, for example, reduced flooding, enhanced placemaking, urban cooling, and air pollutant removal).
- 2.14 The importance of natural capital and ecosystem services is recognised in national policy (e.g. Biodiversity Net Gain is becoming mandatory), and key policy statements are in the process of being developed locally. In 2023, Oxfordshire County Council started work on the preparation of a Local Nature Recovery Strategy, working with Natural England and the District and City councils. This will provide a statement of biodiversity priorities and identify which areas of Oxfordshire should be prioritised for different kinds of nature recovery actions. It will be informed, *inter alia*, by the natural capital baseline map for Oxfordshire which illustrates the spatial distribution of ecosystem services across the county, and was produced by the Environmental Change Institute (University of Oxford)²⁹.
- **2.15** More generally, a resilient, thriving natural environment is important not only for a functioning economy, but for a happy, healthy society. Within this context, Oxfordshire Local Nature Partnership (OLNP) is working to enhance nature across Oxfordshire. Recognising that many businesses are committed to this agenda, it is exploring the scope for innovative financing mechanisms linked to addressing both ecological and climate emergencies³⁰.
- **2.16** There are many examples of local projects to enhance ecosystem services. One local example of an environmental charity working in the context is summarised in Box 2-3 below, drawing on material submitted through the Call for Evidence.

Box 2-3: Earth Trust

Earth Trust is an Oxfordshire based environmental charity with 40 years of experience in inspiring people to address climate, biodiversity and wellbeing with the power of natural green spaces.

Its own projects are generating new evidence, data and research partnerships to demonstrate the value of nature based solutions in achieving net zero and addressing the climate, ecosystems and health crises. Examples include:

³⁰ See Financing nature-based solutions in Oxfordshire A strategic plan to catalyse a framework of natural capital investment, prepared by Oxfordshire Local Nature Partnership.





²⁹ See Natural Capital in Oxfordshire - Short Report. Prepared by Alison Smith, ECI, University of Oxford (September 2021)

- Farming in a changing context working with the environment to enhance a biodiversity partnership that assists in minimising the farm's carbon emissions and maximising its carbon sequestration, whilst producing quality food.
- River of Life II wetlands creation delivering the largest wetland creation project on the Thames, demonstrating flood plain as well as protected species and habitat nature-based solutions for climate resilience.
- *Pioneers of Biodiversity Net Gain* providing an early exemplar of how biodiversity loss at one location can lead to enhancement of a rare habitat nearby.

Clean and renewable energy

2.17 It is paramount that there is an increase in clean and renewable energy if the UK is to realise its Net Zero goals. Solar has been identified as the best renewable energy resource for Oxfordshire, due to the relatively high insolation levels when compared to wind and hydro, since the county does not benefit from the same wind as coastal counties, and positions for hydro are limited. Currently, Oxfordshire contributes over 3% of the UK total photovoltaic capacity which is over twice its share by population and land area.³¹ There is opportunity to expand the solar provision despite the lack of incentives for individual uptake - however, large scale solar will compete for land, which is a scarce and a highly contested resource in the county.³² Consultations also suggested that new innovative approaches to solar are being developed by researchers in the region - and that investment in clusters of activity around solar, in a similar manner to those in Fusion, might benefit the region's economy and support achieving global Net Zero goals.³³ Box 2-4 outlines Fusion's potential role in Oxfordshire's green economy.

³³ ibid





³¹ Sam Hampton, Lewis Knight, Hannah Scott, Hannah Budnitz, Gavin Killip, Scot Wheeler, Alison Smith and Nick Eyre Pathways to a Zero Carbon Oxfordshire, 2021, Available: https://www.eci.ox.ac.uk/publications/downloads/PazCo-final.pdf

³² ibid

Box 2-4: Fusion in Oxfordshire

Key to Oxfordshire's energy innovation landscape is the fusion technologies operating out of Harwell and Culham science parks.³⁴ While fusion is likely to play a large role in the future of clean energy, its ability to deliver on the current Net Zero targets is questionable, with commercially viable products unlikely to be readily available until after 2050. That being said, there are economic opportunities for Oxfordshire stemming around spillovers and spin outs from technology developed as part of fusion research (for example the magnets used for fusion are also used in healthcare, some crossovers between the space industry and developing AI control systems). Furthermore, the fusion cluster in Oxfordshire brings significant external investment to the area. However, evidence submissions and consultations suggest that the cluster remains somewhat insular, despite wanting to increase its collaborations. While R&D remains firmly in Oxfordshire, the site of the first fusion energy plant is set to be in Nottinghamshire.³⁵

2.18 Alongside community approaches, the ecosystem of existing networks and groups around Net Zero and Sustainability in Oxfordshire was identified as a strength by evidence submitted, existing documentation, and consultations. There is a rich and complex set of peer led and public sector supported networks. However, cross pollination between networks, and coordination across the networks can be an issue. Examples of frequently mentioned networks can be found in Box 2-1.

Net Zero and Sustainability - key observations made during stakeholder workshops, March 2023

The first set of workshops undertaken as part of the Independent Economic Review process focused on gathering evidence and insight across four 'deep-dive' areas.

Stakeholder feedback in relation to Net Zero and Sustainability included:

- There is a growing push towards consideration of the environment / sustainability from local businesses, and we are increasingly seeing businesses and wider development shift towards more sustainable business models. However this is not uniform across the economy, and work needs to be done to encourage more businesses to adopt better/more sustainable practices.
- There is a real challenge, particularly for businesses within our foundational economy, in adapting net zero practices. Many businesses are surviving on a week-by-week basis (particularly with the cost of production crisis and hangover from the pandemic) meaning businesses don't have the resources and/or capacity to look into more sustainable practices.

https://www.gov.uk/government/publications/towards-fusion-energy-the-uk-fusion-strategy; Fusion energy in Oxfordshire 2021, UK Government

https://www.great.gov.uk/international/content/investment/opportunities/fusion-energy-in-oxfordshire/linearized and the content of the cont

 $^{^{35}\,}Site of \,UK's\,First\,Fusion\,Energy\,Plant\,Selected,\,2022, \\ \underline{https://www.gov.uk/government/news/site-of-uks-first-fusion-energy-plant-selected}$





³⁴ Towards fusion energy: the UK fusion strategy, UK Government, 2021

- There is growing recognition of the importance of the natural environment in Oxfordshire, particularly through ecosystem services and natural capital. There are links between ecological challenges and the climate emergency.
- Post-pandemic shifts in working practices have benefitted carbon emissions; for example, working from home has meant less community journeys. However, it is recognised that this does not work across the whole economy, and that sudden changes in behaviour had a big impact (often negative) on the foundational economy.
- There are real challenges in relation to energy infrastructure, particularly if we want to develop more community energy schemes. Oxfordshire should be a testbed for new technologies (particularly at a community scale), but we don't have the infrastructure to enable this.
- Retrofitting homes is a huge opportunity for Oxfordshire, but we need the right skills and businesses to enable this. Much of this is subject to national funding, which has been volatile in recent years.





3. Looking to the future

3.1 Oxfordshire has one of the strongest economies in the UK, and over the past decade all five districts have made progress in terms of their Net Zero emissions and Sustainability in various areas as detailed in the PAZCO report. There is county-wide recognition and acceptance of the climate emergency as one of the top priorities. However, if Oxfordshire is to sustain the momentum achieved to date, there is a need to confront prevailing challenges as well as harnessing future opportunities.

Challenges

Economy vs Environment

3.2 Despite the relative strengths of the Oxfordshire economy, there remain concerns about the compatibility with the challenges associated with environmental sustainability. Many of the consultations and open forums served to highlight how the focus on the climate emergency must not be compromised despite the prevailing fiscal constraint. There is considerable pressure on local leaders given the economic environment. However, Net Zero also represents a growth opportunity, with the prospect that Net Zero investment could boost GDP by 2 per cent by 2030 and 3 per cent by 2050.

Land use and space

3.3 Demand for land is high in Oxfordshire. There are competing interests around agriculture, which was mentioned as "often forgotten" in the Oxfordshire debate around Net Zero, as well as renewable energy sites, housing developments, carbon sequestration, bioenergy and maintaining areas green spaces/biodiversity. Despite the obvious need for maintaining green space, there are also competing interests for available land relating to commercial development, 'green economy' projects such as solar farms, and the development of affordable housing. It is important to acknowledge that the implications of different land use go beyond first order (direct) more visible impacts such as using land for carbon sequester, versus greening existing agricultural systems which are important but often unnoticed.

Affordable and sustainable housing

3.4 The availability of affordable housing is having a real impact on the ability of employers to both attract skilled workers to Oxfordshire and retain qualified workers given the high cost of housing. Delivering sustainable and affordable housing is about more than energy performance, and demands a more systems based approach to living that may include solutions from car-sharing to onsite energy generation. As well as the need to develop more affordable and sustainable housing, there is a need to expedite retrofitting. This will help





curtail the carbon emissions associated with existing properties and also address the issue of fuel poverty faced by a growing proportion of households.

Energy Infrastructure

3.5 New clean and renewable energy projects rely on existing energy infrastructure which is struggling to keep up with changes in the ways in which energy is generated and supplied. Consultees and evidence submitted discussed the limitations of local energy generation, particularly when it comes to feeding into the national grid. As noted in the PAZCO report, 61% of Scottish and Southern Electricity Networks' substations are described as constrained for additional generation according to the PAZCO.³⁶ This impacts on the potential for community generation projects, evidence submitted by Cherwell District Council noted that this had already prevented more renewable energy projects.

Green travel and transport

3.6 Despite significant investment and attention, transport remains a core issue for Oxfordshire achieving Net Zero. As described in the Pathways to Zero Carbon Oxfordshire, there are three key components to decarbonising transport: avoid (by telecommuting to work), improve (towards electric vehicles), and shift (towards local active travel, and concepts such as the 15 minute neighbourhood). While home-working has seen a reduction in commuting emissions, and the uptake of electric vehicles in Oxfordshire is high (i.e., c.50% of newly registered vehicle in January 2023) there remains challenges around charging points³⁷. Oxfordshire's bus network is operating at 80-85% of pre-pandemic levels³⁸ and only 5.6% residents commute on buses - there is much to be done to regain ground lost from public transport to private vehicles during the pandemic. Oxford is second only to Cambridge in rates of cycling, however, in the wider county the percentage of residents using 'active travel' to get to work is 18% less than residents in the City. Active travel also has benefits beyond Sustainability and Net Zero for health and wellbeing.

National policy limitations

3.7 The tension between national policy objectives and regional priorities are not new. However, there is widespread recognition that local authorities are central to the Government's ambition for achieving Net Zero^{39,40}. A locally driven approach towards decarbonisation is necessary, although without a central government framework and funding this will be

⁴⁰ A place-sensitive approach is crucial for effective environmental policy, argues new British Academy report, British Academy, 2023, Available: https://www.thebritishacademy-report/





³⁶ Sam Hampton, Lewis Knight, Hannah Scott, Hannah Budnitz, Gavin Killip, Scot Wheeler, Alison Smith and Nick Eyre Pathways to a Zero Carbon Oxfordshire, 2021, Available: https://www.eci.ox.ac.uk/publications/downloads/PazCo-final.pdf

³⁷ Phase two of Go Ultra Low Oxford to start this spring, Oxford City Council, 2023

https://www.oxford.gov.uk/news/article/2376/phase two of go ultra low oxford to start this spring

³⁸ Oxfordshire Enhanced Partnership Plan & Scheme, Oxfordshire County Council, 2023, Available: https://www.oxfordshire.gov.uk/sites/default/files/file/roads-and-transport-policies-and-plans/OxfordshireEnhancedPlan.pdf

³⁹ <u>Local Authorities and the Sixth Carbon Budget</u>, The Climate Change Committee, 2020, Available: https://www.theccc.org.uk/publication/local-authorities-and-the-sixth-carbon-budget/

difficult to realise. There continues to be a need to better align national strategy and local delivery. In particular, there remains a need to simplify and consolidate the number of local Net Zero funding streams to provide continuity for local authorities, businesses and community groups.

Opportunities

Adopting green innovation

3.8 The adoption and diffusion challenge is not a regional challenge *per se*, however evidence suggests that the strengths of business networks are a major factor in the roll out and uptake of new technologies. Oxfordshire has a world renowned innovation ecosystem with particular strengths in green technologies; however there is an opportunity to increase the uptake of innovations by firms. The adoption of already existing but new to firm innovation may involve the purchase of technology, machinery or licences. Perceived cost and capacity constraints are often regarded as a barrier to adoption, which highlights the importance of showcasing early adopters and promoting demonstrators. The Zero Carbon Oxford Partnership Report also identifies how a 'matchmaking' service between technology firms and local industrial companies could help to address the commercial adoption of new green technologies.⁴¹

Ecosystem services, nature recovery and nature markets

3.9 Looking ahead, enhancing and restoring ecosystem services will be important as part of a more general emphasis on nature recovery. In this context there could more opportunity for nature markets – recognising the need for a flow of private finance to nature, so that farm businesses and the growing pipeline of nature projects have access to the investment they need to grasp the opportunities of the transition to a nature-positive economy⁴². Oxfordshire ought to be well placed in this context given its well-developed network of equity investors and philanthropists, and early work is being led by Oxfordshire Local Nature Partnership and others.

Collaboration across sectors

3.10 The actors and assets across the green economy in Oxfordshire are currently fragmented, with select pockets of collaboration and cooperation. Stronger leadership and a clearer vision is needed to convene the myriad of individuals and organisations to tackle sustainability challenges. With limited engagement across different sectors and industries, there remain untapped possibilities for innovation and the deployment of existing innovations in new contexts. The consultations highlighted how organisations struggle to make and pursue cross sector connections. In particular, there are opportunities that relate to the development of the

⁴² Nature Markets: A Framework for scaling up private investment in nature recovery and sustainable farming, HM Government (March 2023) See Nature markets: (publishing.service.gov.uk)





⁴¹ ZCOP Action Plan Full Report, Zero Carbon Oxfordshire Partnership, 2021, Available:

https://www.oxford.gov.uk/downloads/download/1241/zero carbon oxford partnership roadmap and action plan

circular economy in Oxfordshire, where one business' waste can be used in another business' product. Promoting knowledge sharing is crucial to raising the awareness and engagement of organisations, and is a critical precursor to collaboration and co-creation at scale. New ways to enable knowledge sharing, such as an online resource that brings information and organisations together, could be useful for local businesses based on evidence submitted.

Distributed leadership and governance

3.11 In order to realise the Net Zero and Sustainability goals set by public and private sector organisations demands a systemic way of thinking beyond command-and-control leadership. A multipolar approach towards leadership and governance is necessary, recognising that rational behaviour alone will not accomplish the goals; with organisations and actors each with distinct values and different purposes. There is scope to foster more participatory approaches to Net Zero Sustainability in the wider county. While much of the existing progress towards Net Zero has come from decarbonising the energy sector, future gains will only be made with changes to people's behaviours and lives. 43 To facilitate a 'just transition', as discussed in consultations, future engagement on the future of Net Zero and the economy should include the general public.

The power of small business

3.12 The business benefits of sustainability have yet to be understood by many small businesses. 44 And with small businesses making up a significant part of the economy in Oxfordshire, there is a considerable opportunity to raise awareness about sustainable business practices. Although small businesses do not have the same statutory reporting requirements as larger businesses, they are often open to making changes when the options are understood, and their ambitions are often broader than Net Zero. There are a range of exciting projects being delivered in Oxfordshire that are often overshadowed by big initiatives. Initiatives such as Small Business Sustainability Basics, OxFutures free energy audits for SMEs and Energy Solutions Oxfordshire programmes of assessment for all businesses have all been oversubscribed. There is an opportunity to harness small businesses in achieving Net Zero and Sustainability goals, although such support needs to have continuity in order to be recognised as an established part of the business landscape.

Harnessing the green economy

3.13 Oxfordshire has been able to attract significant investment in large scale green demonstrators and technologies particularly around developing clean energy. However, the challenge remains harnessing the value of these demonstrators and pilots to the wider business base. This could be realised through the adoption of technologies through supply chains and

⁴⁴Sara le Roux, Lauren Tuckerman, Tim Vorley, Small Business Sustainability: Insights & Implications, 2022. Available: https://www.brookes.ac.uk/business/about/news/2022/10/small-business-sustainability-research/





⁴³ Christina Demski, Net zero public engagement and participation: A research note, 2021, Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/969428/net-zero-public-engagement-participation-research-note.pdf

associated with larger projects such as those at Harwell and Culham science parks. Attracting and retaining investment is also key to the longer vision relating to Net Zero and Sustainability, especially where they are encouraging their suppliers to address and improve their carbon emissions.

Implications

3.14 There is a general consensus that Net Zero and climate change, and broader sustainability considerations, should be a priority for Oxfordshire, as elsewhere. However, a decision to prioritise paths to Net Zero and addressing the climate change emergency will mean making decisions that could influence other priorities and options. The consultations and evidence review have highlighted a range of areas that could be reflected in the SEP and associated action plans. These include:

Promoting collaboration and participation

3.15 The consultations and review highlight the value of sustaining more participatory approaches towards the Net Zero and climate change agenda in Oxfordshire. While there are some examples of community engagement in Oxfordshire, there are stronger examples in other City Regions including Leeds, Belfast and Edinburgh (see Box 2-2). Engaging businesses, policymakers and the wider general public in constructive debate around prospective challenges and solutions to the Net Zero and climate change agenda are widely regarded as critical. Engagement and collaboration are necessary to engender commitment and co-create solutions to achieve Net Zero and realise climate change goals.

Creating a shared Net Zero and Sustainability Roadmap / Action Plan

3.16 As well as encouraging engagement and more participatory approaches towards Net Zero and sustainability in Oxfordshire, it may be useful to develop a county-wide roadmap and action plan building on the Pathways to a Zero Carbon Oxfordshire (PaZCO) report published in 2021. Akin to the Zero Carbon Oxford Partnership (ZCOP) roadmaps and action plans for Oxford, there is value in forging a coordinated response. Oxfordshire has been forward thinking in its consideration of Net Zero and sustainability, and a coordinated response could be helpful.

Continuity of green funding opportunities

3.17 There has been a range of different initiatives to support and promote sustainability and Net Zero initiatives in Oxfordshire. However, many of these are short term and ad hoc, meaning that there is at best partial awareness of such schemes and that they do not gain sufficient traction to meaningfully deliver change. Ensuring the consistency, continuity and regularity of funding is essential if more businesses are to access and make use of such schemes.





Green growth support

3.18 The large number of SMEs present both a challenge and opportunity for realising green growth in Oxfordshire. The British Business Bank estimates that small businesses contribute 52% to the total UK business carbon emissions, and are therefore critical to meeting Oxfordshire's Net Zero ambition. There is no consistent support available for small businesses, which needs to start with raising awareness about Net Zero and demystifying the journey of transition. Promoting understanding and engagement is a key first step to harnessing green growth.

Greening Supply Chains

3.19 There is an opportunity in Oxfordshire to work at a LEP level to support and strengthen the greening of supply chains. In particular there is potential to support businesses become part of low carbon supply chains. To make further progress in this area there is a key role in raising awareness of and convening opportunities that strengthen collaboration between businesses, and other partners, across the supply chain. Participation in such supply chains may also support innovation and skills development, as well as accelerating the adoption of resource efficient and renewable technologies.

Public sector procurement

3.20 The allocation of public sector funding to achieve economic and societal outcomes is not new, but there is an opportunity for local authorities to implement more progressive procurement policies. There is considerable opportunity for local authorities to leverage greater value for money and realise sustainability and Net Zero outcomes. There is scope to work with local councils to develop procurement targets around Net Zero, thereby using procurement policy as a tool to achieve greater social and environmental value.

Delivering green skills

3.21 A central challenge to achieve the Net Zero transition in Oxfordshire is ensuring that the skills pipeline is in place. The LSIP must ensure that there are enough people with higher level engineering, science and technology skills, as well as having the operational workforce with related skills at Level 2/3 (i.e. for retrofit and installation). There is also a need for more biodiversity professionals. Given the importance of 'Green Skills' there is a need to redesign and refocus the policy changes that have been in place over the last 10 years. The creation of a 'Green Skills Hub' or equivalent could provide a vehicle to accelerate the skills transition in the region.

Net zero related inward investment

3.22 Realising the Net Zero ambition needs to leverage opportunities in inward investment into the low carbon energy projects; these may include renewables, hydrogen, carbon capture,





energy storage, and smart grids. As with other places, Oxfordshire needs to commit to decarbonising all elements of its energy system. Net zero represents a growth opportunity for Oxfordshire to 2050, although it needs to be both affordable and efficient if it is to be widely adopted and benefit regional businesses.

Investing in long term green futures

3.23 The UK has been a longstanding leader in fusion energy development, and the Culham Centre for Fusion Energy is the UK's national fusion research laboratory, and is based at the Culham Science Centre. Although a leader in fusion science and research, no fusion facility in the UK has yet demonstrated net energy gain from fusion. If it can be successfully demonstrated and commercialised, fusion technology could provide a sustainable, low-carbon source of energy. The development of fusion technologies and the fusion energy market must remain a longer term objective for Oxfordshire.





4. Net Zero and sustainability: Summary SWOT

4.1 Based on the evidence and argument set out in previous chapters, Table 4-1 provides a summary SWOT assessment as an input into the new SEP.

Table 4-1: Net Zero and sustainability: Summary SWOT

Strengths

- **Political commitment to Net Zero** all local authorities are committed to net zero both as organisations and across their geographies.
- World leading research the University of Oxford, Oxford Brookes University and various campuses (e.g. Harwell Campus) are engaged in researching Net Zero and green technologies.
- **Sector strengths** business innovation in the low-carbon sector is particularly strong in Oxfordshire, as one of the UK's leading low-carbon innovation ecosystems.
- **Community projects and initiatives** these are committed to realising Net Zero and Sustainability ambitions with a strong local grassroots focus.
- **Strong higher level skills profile** the present regional skill profile is strong around high level skills, as the two universities are developing technical skills related to sustainability.
- Innovation Assets the presence of innovations assets such as the Eco Business Centre, TESA and iHUB present a competitive strength of the region.
- **Ecosystem services and nature recovery** growing commitment to both in the context of climate change adaptation, and more generally.

Weaknesses

- Ad hoc/short-term funding despite support being available to support businesses the lack of continuity can undermine the impact of available funding.
- **Coordination and participation** there is a broad range of organisations and stakeholders in the Net Zero economy that are not always coordinating and collaborating yet.
- **Public transport** the use of public transport is still lower than prepandemic, and the proportion of workers commuting using public transport is low and car use is high. There is scope to influence the strategic transport network planning in the county.
- Retrofit and maintenance there are neither sufficient levels of consumer demand nor commercial capacity to deliver retrofitting to reduce energy demands in the region.
- Awareness & Engagement organisations which do not have Sustainability
 or Net Zero as central to their business need to be made more aware of the
 support and business opportunities offered by Net Zero.

Opportunities

• **Links between the economy and Net Zero** – there are economic opportunities linked to the transition to Net Zero.





- Green innovation this represents an opportunity, and there may be scope for different specialisms to work together to achieve it in response to local needs and global markets.
- Natural capital and nature markets this is attracting growing interest, including in relation to nature markets (and the flow of finance), and Oxfordshire ought to be well-placed.
- **SMEs and Net Zero** there is an opportunity to influence the behaviour of smaller businesses and to encourage them to effect a transition towards Net Zero.
- **Collaboration and partnership** there is an opportunity for far greater partnership working in response to Net Zero ambitions; a road map and action plan could help.
- Public procurement this could be used as a route to effecting Net Zero transitions through supply chains, etc.

Threats

- **Investing in Net Zero** there is a need to increase the levels of investment in transport, buildings and the energy system in Oxfordshire if the county is to meet national objectives and targets.
- **Competing demands on land supply** there are many competing demands, from agricultural uses, employment provision, housing provision, etc., which are difficult to reconcile.
- **Energy infrastructure** this is under substantial pressure.





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