oxfordshirelep.com

Oxfordshire takes lead in the Green Recovery

Energy strategy and economic development



20 January 2021



Oxfordshire to play central role in UK's 'green recovery'

- The <u>Oxfordshire Energy Strategy</u> sets out an ambitious framework for the county to be at the forefront of energy innovation to foster clean growth.
- Clean energy offers communities and businesses real opportunity in Oxfordshire and the UK. The low-carbon economy has the potential to grow by 11% pa over the next decade to 2030, four times faster than the projected growth of the UK economy.
- The ambition for the Oxfordshire Energy Strategy aligns with the overall vision of the <u>Oxfordshire Local Industrial Strategy</u>, positioning the county as a top-three global innovation ecosystem by 2040.
- The low-carbon sector already makes a significant contribution to Oxfordshire's economy, generating £1.15bn a year (7% of Oxfordshire's GVA). The Oxfordshire Energy Strategy can help to spearhead a further £1.35bn annually to the local economy, creating over 11,000 new jobs by 2030.





How is Oxfordshire getting on the front foot to deliver clean energy?

The Oxfordshire Energy Strategy has three guiding principles:

- To secure a smart, modern, clean energy infrastructure through increased electricity grid capacity, supporting:
 - planned housing
 - industrial and commercial growth
 - changing energy requirements.
- To reduce countywide emissions by 50% by 2030 (compared with 2008 levels) and set a pathway to achieve zero carbon growth by 2050. Realising the economic benefits of a low-carbon transition by supporting:
 - Ambitious and innovative clean generation projects across the county, both in urban and rural areas, as well as growth locations.
 - Projects that reduce energy demand and increase energy efficiency for domestic, industrial, commercial buildings and transport.
- To enhance energy networking and partnership working, galvanising pioneers in clean growth, leading influencers and thinkers and those with a passion for low carbon initiatives across Oxfordshire to leverage their collective activities to support the scaling-up of future solutions and accelerate delivery towards a net zero-carbon county.





Delivering the Oxfordshire Energy Strategy

The Energy Strategy places Oxfordshire at the forefront of energy innovation to deliver clean growth, and workstreams are being developed around the following themes:

- New developments
- Grid capacity
- Low carbon generation
- Demand reduction
- Growing the low carbon economy
- Sustainable transport





New developments

Building standards

- Oxfordshire has the UK's first eco town, <u>NW Bicester</u>, reflecting high standards of sustainable living while also maximising the potential for affordable housing.
- Local authorities have enabled innovative energy and low carbon projects, such as energy master-planning and low carbon <u>district heating</u> for Didcot Garden Town.
- <u>Springfield Meadows</u> development in Southmoor is a development of 25 net-zerocarbon-in-operation houses, with innovative hemp and lime pre-fabricated panels that lock up carbon, triple glazing, solar PV on every roof, wildlife pond, an EV car club for residents, 90% reduction in carbon emissions during construction compared to a standard home in the UK of a similar size. It has been endorsed as a One Planet Living global leader by <u>Bioregional.</u>

Sustainable construction

• The <u>Eco Business Centre</u> at Elmsbrook in Bicester, opened in 2019, is the UK's first non-domestic building to achieve 'Passivhaus Plus' status.

Ownership/development models

• <u>Osney Lock Hydro</u> was set up by a group of local residents in West Oxford to enable the development of the first community-owned hydro scheme to be built on the Thames. It became fully operational in May 2015, generating clean electricity for the equivalent of 50 houses.





Grid capacity

Planning for new developments & low carbon generation

- <u>Energy Superhub Oxford</u> (ESO), a demonstrator project funded by InnovateUK, will heat 300 homes using smart 'shoebox' ground source heat pumps, as part of a world-first project to demonstrate the benefits of smart local energy systems.
- Oxford Foundry-incubated company Ecosync has a cloud-based platform that can synchronise and control heating so that only occupied areas in commercial buildings are heated, saving wasteful heating of empty rooms.

Smart grid

Project Leo, (Local Energy Oxfordshire), a trailblazing <u>InnovateUK</u> partnership project led by SSEN, is piloting a flexible approach to electrical energy provision via smart grid trials. Factors for choosing the region include its progressive local authorities and thriving community energy scene.

Storage

- Around 35 companies and 900 people contribute to research into electrochemical energy storage in Harwell's <u>Energy Tec Cluster</u>. The <u>Faraday</u> Institution, the UK's independent institute for electrochemical energy storage science and technology, which links 20 universities and 30 industry partners, is a key stakeholder. Its Fast Start project has supported innovators such as <u>ZapGo</u>, which is developing a new approach to energy storage.
- <u>Brill Power</u> is developing intelligent battery management and control technology to increase the lifetime and reliability of lithium-ion battery packs for stationary energy storage and electric vehicles.
- <u>ESO</u> projects include the installation of a UK-first <u>battery energy storage</u> hybrid battery energy storage scheme.





Low carbon generation

New developments

- The <u>Culham Centre for Fusion Energy</u> is the UK's national nuclear fusion laboratory. Its STEP (Spherical Tokamak for Energy Production) programme aims to deliver the world's first fusion reactor by 2040. The exciting £220m venture to design a viable fusion power station, announced in October 2019, could be operational by 2040. Fusion could complement renewable energy sources to meet future demand and counter the threat of climate change.
- Oxford University Innovation has spun-out 223 companies, including SunReign, whose <u>Powermarket</u> AI deep learning product provides solar analytics and insights, and <u>First Light Fusion</u> in Kidlington, which is researching energy generation by inertial confinement fusion.
- Research currently being carried out by the <u>University of Oxford</u> includes the development and commercialisation of novel perovskite materials by <u>Oxford</u> <u>Photovoltaics</u> and the use of green ammonia as an energy storage solution. The <u>Oxford Martin School</u> is carrying out studies into the integration of renewable energy and the future of cooling.





Low carbon generation

Strategic sites

 Major research centres include the <u>Faraday Institution</u>, the Centre for Research into Energy Demand Solutions (<u>CREDS</u>), and the <u>Culham Centre for Fusion</u> <u>Energy</u>, based at the <u>Culham Science Centre</u>.

Community energy

- <u>The Low Carbon Hub</u> has installed solar panels on 31 schools at no cost to the schools. Excess energy is sold to the grid and reinvested in community energy projects. The Hub brings together 32 low carbon community groups and aims to create a grid of small community renewable energy schemes. It has documented around 271 renewable energy installations or 'people's power station' projects around Oxfordshire, ranging from mini hydro schemes to solar power, and together generating 865Gwh.
- Project <u>ERIC</u> (Energy Resources for Integrated Communities) is an initiative bringing solar PV power and smart energy storage to 82 homes a school and community centre in Rose Hill, East Oxford. Led by <u>Moixa</u> and <u>Bioregional</u>, it is part-funded by <u>Innovate UK.</u>
- <u>Westmill Solar Co-operative</u> in Watchfield is the UK's first community-owned solar farm, with 1,500 members. The site consists of 30 acres of over 20,000 polycrystalline PV panels generating 4.8GWhr/year this is approximately equivalent to the annual electricity consumption of around 1,600 average homes.





Demand reduction

Housing and communities efficiency

- <u>Cosy Homes Oxfordshire</u> is a one-stop home retrofit service to improve the energy efficiency of homes. The Low Carbon Hub project, in partnership with <u>National Energy</u> <u>Foundation</u> and <u>RetrofitWorks</u>, has had over 250 registrations and delivered over 150 whole house plans.
- <u>Community Action Groups</u> are taking action with practical projects to reduce waste, water and electricity usage. The network of 80 member groups saw 191 tonnes of carbon avoided, 82 tonnes waste avoided, and 62,323 KwH of energy saved from 2018-2020.
- Business energy efficiency
- OxFutures, a £3.2m project to boost low carbon economic development in Oxfordshire, supported by the European Regional Development Fund (ERDF) and run through a collaborative partnership between the Low Carbon Hub, Cherwell District Council, Bioregional, Oxford City Council, the University of Oxford, and Oxford Brookes University, has delivered free energy audits to 130 SMEs, funded 28 to make improvements, and given funding to 14 innovation companies.
- The Low Carbon Hub, a social enterprise that develops community-owned renewable energy projects and supports low carbon groups in Oxfordshire, will continue its work with an extension for the next three years from 2020. It provides innovation grants for low carbon start-ups or technologies, and its new <u>Energy Solutions</u> programme will help SMEs transition to low carbon solutions, and will encourage wider use of ESCOs, energy services companies which gain the benefit of the payback of renewable energy into the grid.
- The Low Carbon Hub has installed some significant solar panel installations, including two in Banbury: the UK's biggest rooftop solar array at <u>UTC Aerospace Systems</u>, generating 593,304 kWh of clean electricity per year, and 2,466 solar panels at engineering company <u>Prodrive</u>.
- <u>Energy Solutions Oxfordshire</u> a spin-out from the Low Carbon Hub and <u>Energy Pro</u>, offer organisations a 'one-stop' energy efficiency service.





Growing the low carbon economy

Skills

Oxford is the UK's innovation capital. Oxfordshire will be a top three global innovation ecosystem by 2040 and the highly-skilled workforce in the region is powering that ambition. With a long tradition in energy, as the home of the <u>UK Atomic Energy Authority</u> as well as in transport engineering, the regional has grown a unique and world-leading combination of expertise and experience.

Business innovation & growth

<u>Tokamak Energy</u> in Didcot, a spin-out from Culham Laboratories in 2010, is developing fusion energy. It has raised over £117m of private investment since it was founded 10 years ago and has expanded rapidly through two of Oxfordshire's world-leading clusters: fusion energy and high temperature superconductors. It has 85 staff, recruited from a base of highly skilled engineers and scientists in the region.

Business networks

Oxfordshire Greentech is a low-carbon business network, initially one of the strands of the OxFutures £3.2m ERDF-funded programme but now independent. It launched in February 2019 and has over 100 paying member organisations, ranging from innovative SMEs to local authorities to organisations like law firm Taylor Vinters and business accountants Shaw Gibbs. It is directing the county towards a low-carbon future by hosting events on the real cost of EV ownership, circular economy, accessing finance for low-carbon products/services, and the future of the built environment. Through knowledge transfer and networking opportunities, businesses can connect, learn from each other, implement new solutions, and strengthen the local and low-carbon economy. Cambridge Cleantech is a partner and sister network to facilitate stronger Oxford-to-Cambridge connections. Oxfordshire Greentech's aims map onto OxLEP's Energy Strategy.





Sustainable transport

Modal shifts

- The UK's autonomous cars programme began in 2010 at the <u>Oxford Robotics</u> <u>Institute</u>, part of the University of Oxford. <u>Oxbotica</u>, a spin-out created in 2014, now leads the UK consortium to develop and launch driverless vehicles on public roads, working with <u>RACE</u> (Remote Applications in Challenging Environments) at Culham.
- The <u>ORI</u>'s Mobile Robotics Group is applying machine learning, AI and robotics expertise to the development of autonomous vehicles. In 2013 it demonstrated the first autonomous vehicle on UK roads, driving around <u>Begbroke Science Park</u>.
- The Oxford-centred DRIVEN consortium is developing and testing a fleet of autonomous vehicles. <u>Five AI</u> is developing a fully autonomous shared transport service for Europe's cities. Oxford's <u>Streetdrone</u> was the first company in Europe to run an open-source self-driving vehicle on the road.
- Oxfordshire Transformative Technologies Alliance, an SIA (Sciences and Innovation Audit) was supported by OxLEP in 2018, focusing on four large scale disruptive technologies, one of which was autonomous vehicles.
- Electric vehicle production: <u>YASA</u>, an OU spin-off founded in 2009, can produce 100,000 electric vehicle motors a year at its Kidlington site. It benefited from the Government's Advanced Propulsion Centre initiative and has created 150 jobs. <u>Arrival</u> is developing an electric bus and an electric small van at its global R&D centre and van production site in Banbury, and has chosen Bicester as the site of its new bus microfactory. <u>Saietta</u>'s breakthrough AFT electric motor is currently in low volume production at Upper Heyford.





Sustainable transport

Transport infrastructure

- Oxford will be the country's first <u>Zero Emission Zone</u> from August 2021.
- Plans for the East-West rail route linking Oxford and Cambridge are progressing. The line has potential to support opportunities for new housing, reduce congestion and offer fresh investment opportunities.
- <u>Energy Superhub Oxford</u> (ESO) is demonstrating scalable solutions for electric vehicle charging for local bus and psv fleets and will see the installation of 100 rapid and fast public charging stations.
- Oxford Foundry has supported Intellicharge, a software application that helps electric vehicle owners to charge their cars with the cheapest and the greenest electricity.
- Oxford City Council's <u>Go Ultra Low Oxford</u> is trialling on-street electric car charging solutions for residents who are considering buying an electric vehicle or own an electric vehicle and need access to electric charging points. OCC plans to deliver and install approximately 100 chargers over the next two years.
- A <u>Park and Charge</u> pilot is looking to deliver a large scale demonstration project providing an EV charging and EV sharing service for Oxfordshire's communities who do not have access to home charging. In the pilot, 300 Smart Chargers will offer the latest connectivity with dynamic billing rates based on electricity demand.
- <u>V2GO</u> (Vehicle-to-grid Oxford) is investigating how electric vehicles can be used to store and flow electricity back into the grid.





Investment opportunities

- Ensure that the electricity grid in Oxfordshire is developed in a way that accommodates planned phased growth as identified in the existing Local Plans.
- Utilise the opportunities presented by new development and additional grid capacity to help deliver innovative community-level renewable energy projects.
- Enable the development of energy projects that have been constrained by the lack of adequate grid capacity in the past.
- Exploit the Smart Grid approach to enable more sustainable use of energy, including charging points for EVs, demand-side responses and energy storage.
- Enhance the Living Laboratory concept for testing new technologies, monitoring results and building partnerships.



For further information:

Ahmed Goga Director of Strategy & Programmes Oxfordshire Local Enterprise Partnership ahmed.goga@oxfordshirelep.com +44 (0) 7393 001076



