

Oxfordshire for energy

Choosing to invest in the UK's
energy development heartland



Where multidisciplinary collaboration stimulates innovation



Why Oxfordshire?

Our county is at the heart of the UK's energy development.

This region has all the key ingredients of a global centre for energy innovation:

- thriving energy clusters
- successful businesses
- multidisciplinary collaboration
- long history of energy development
- world-leading experts
- a dynamic, agile, and skilled workforce.

Global hub for energy investors

With an established track record of attracting investment from around the world, Oxfordshire has secured over 340 foreign direct investments at a value of over £3.1 billion in the last seven years.

Foreign-backed energy solutions companies which have expanded or established operations in Oxfordshire during the last three years include [Nexeon](#), [Tokamak Energy](#), [General Fusion](#), [Faradion](#), [Fortescue](#), [First Light Fusion](#) and [Rimac Energy](#).

Energy solutions are playing a major part in making Oxfordshire a world-class innovation ecosystem.



Photo: Jack Hobhouse

Academic research

Home to two universities, the [University of Oxford](#) and [Oxford Brookes University](#), our region has unrivalled centres of academic research into alternative energy sources, energy storage solutions and many related disciplines and applications.

The University of Oxford has several leading institutions noted for their research, facilities and industry collaborations:

- [Oxford Energy](#) is a hub for co-ordinating and collaborating energy research across a range of departments including, among others, engineering, mathematics, computer science and the work of the [Oxford Institute for Energy Studies](#), the [Oxford e-Research Centre](#), the [Oxford Martin School](#) and the [Smith School of Enterprise and the Environment](#). Together they carry out world-leading research on a wide range of energy-related themes including bioenergy;

demand and efficiency; energy policy, economics and law; electricity networks, energy in developing countries, nuclear, solar and energy storage.

- The [Oxford Thermofluids Institute](#) houses the most sophisticated turbine and high-speed flow facilities in the UK. It researches into gas turbine, hypersonics, and energy and environment. Its facilities support development of systems that are widely deployed in industry.
- The [Oxford Materials Characterisation Service](#) offers a comprehensive service for the investigation of materials and materials related problems, applying its expert knowledge and extensive facilities across many different industry sectors as well as offering training.

The [Oxford Institute for Sustainable Development](#) at Oxford Brookes University is one of the UK's largest research institutes dedicated to sustainable development research in the built and natural environments. Energy research is one of its eight distinct research groups.

World-leading facilities

Oxfordshire has long been home to some of the most significant developments in energy research.

More than 6,000 people work at [Harwell Campus](#), home to a vibrant, fast-growing community of research councils, start-ups and multinational organisations. The site hosts over 225 research and technology companies in a wide range of disciplines and internationally-renowned assets. Harwell's [EnergyTec Cluster](#) has 80 dynamic companies and 1,400 people actively researching electrochemical energy storage, many working collaboratively with the site's [Space](#) and [HealthTec Clusters](#). The [Faraday Institution](#) is a key stakeholder, linking 20 universities and 30 industry partners. Other national assets at Harwell include the [Diamond Light Source](#) the [Rosalind Franklin Institute](#), [UK Space Agency](#), [European Space Agency](#) and [Rutherford Appleton Laboratory](#).

The [Science & Technology Facilities Council](#) at Harwell works collaboratively with experts and a range of businesses across a broad range of sectors, enabling them to exploit world-class science facilities such as the [Diamond Light Source](#), to overcome difficult product, manufacturing or process issues. It helps companies to develop new products, accelerate product discovery, and improve processes and products.

The [Culham Centre for Fusion Energy](#), home to 30 industry, academic and public organisations, is a major centre of energy expertise. The [Joint European Torus \(JET\)](#) – the world's largest and most powerful tokamak, operated by the [UK Atomic Energy Authority \(UKAEA\)](#) on behalf of its European partners, has set records for fusion energy since its inception. Culham is the location of the [Mega Amp Spherical Tokamak \(MAST\)](#) Upgrade device which enables industrial and academic researchers to develop novel fusion resilient materials that will be essential in the development of STEP (Spherical Tokamak for Energy Production), the UK's prototype fusion powerplant, due to be in operation by 2040. The [Materials Research Facility](#), which enables industrial and academic researchers to analyse the effects of irradiation on materials, is also located at Culham, offering affordable, convenient access for users from fission, fusion and other research programmes – bridging the gap between university and nuclear licensed site laboratories.

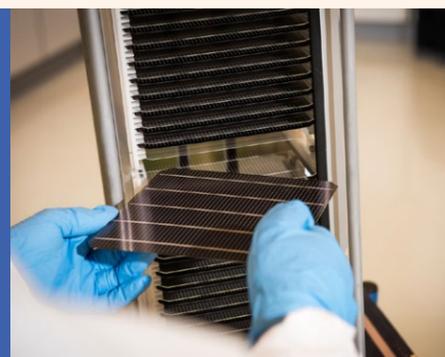
Organisations at Culham benefit from the UK Government's allocation of £42.1 million to the [Fusion Energy Programme](#). This was launched in 2021 to accelerate knowledge transfer, offer a collective approach to tackling climate change issues, and to develop technology and skills.

The Faraday Institution, Harwell.



Successful spinouts

Oxford University Innovation has spun out a new company every two months on average in recent years, including [PowerMarket](#) and [First Light Fusion](#). Research currently being carried out by the University of Oxford includes the development and commercialisation of novel perovskite materials by [Oxford Photovoltaics](#) and the use of green ammonia as an energy storage solution.



World-leading science and innovation centres

Oxfordshire has the key ingredients that make up a world-class innovation ecosystem: a flourishing environment for innovation and business creation; world-leading experts in knowledge and technology development; and a dynamic, agile, and skilled workforce. By 2026, over half a million square metres of new office and laboratory space will be added.

Over 225 research and technology companies in health sciences, med tech, space applications and energy operate on **Harwell Campus**. The site houses the UK's largest space cluster of over 100 growth companies. Critical assets include the **Diamond Light Source**, the **Rosalind Franklin Institute**, **Faraday Institution**, **UK Space Agency**, **European Space Agency**, **Rutherford Appleton Laboratory**, and the **National Quantum Computing Centre**.

Culham Science Centre hosts over 2,000 scientists carrying out world-leading research into areas such as fusion power and autonomous vehicles. Critical assets include the **Culham Centre for Fusion Energy**, which will design and build the world's first compact fusion reactor by 2040, **RACE** (Remote Applications in Challenging Environments), and the **Culham Innovation Centre**.

Within the **Oxford City Science Area**, key development work is ongoing in sectors such as life sciences, digital health, AI technologies and quantum computing. Key assets include the **Oxford BioEscalator**, the **Jenner Institute**, the **John Radcliffe**, **Nuffield**, and **Churchill Hospitals**, and the **Centre for Applied Superconductivity** alongside innovation hubs including the **Wood Centre for Innovation** and the **Oxford Centre for Innovation**. Also in the city centre are the **Clarendon Centre** and **Inventa and Spires**.

The **Oxford Science Park** is home to more than 100 companies, from start-ups to multinationals, working in areas such as drug and device development and AI within a vibrant R&D and commercial community. It offers a variety of design-and-build office and laboratory accommodation, the latest being the **Iversen Building** and the **Ellison Institute of Technology**.

The University of Oxford's **Begbroke Science Park** focuses on advanced engineering and medical tech for 30+ world leading research & technology companies. By 2032, a

£2 billion programme will co-locate engineering, physical and life sciences research to Begbroke's global innovation campus, to work directly with industry.

Oxford Technology Park is a new science and technology park that offers flexible office and R&D space to the north of Oxford. The site is adjacent to London Oxford Airport, with nearby rail access to London.

Oxford North is the city's new innovation district. The 64-acre site to the north of the city will provide 300,000 square metres of laboratories workspace, 480 new homes and provide 4,500 new jobs.

Heyford Park provides a range of commercial accommodation including warehousing, workshops, lab space and offices and is already home to over 100 businesses.

ARC Oxford is an innovation based community close to the city centre and hosts over 60 science, technology and service companies. It offers workspace to suit all sizes of businesses and an amenity rich environment.

The **Bicester Motion Innovation Quarter** will establish a world-leading automotive engineering centre of excellence and offer new accommodation for international technology businesses.

Howbery Business Park is the UK's first solar-powered park. It offers specialist research capabilities to spinouts and start-ups in the water and environment sector.

Abingdon Science Park is home to scientific, research, and high technology businesses. It currently has lab and office space development opportunities.

Milton Park is a science and technology park that is home to 250 companies and 9,000 people and forms one of the largest science clusters in the UK. In 2024 it began to build a £40 million development with flexible R&D spaces.

Wootton Science Park New and growing development with laboratories and workspaces.

Grove Business Park offers office, R&D and industrial buildings, strategically located between the M4 and the A34 roads.

Innovation clusters across Oxfordshire

Western Europe's highest concentration of science research facilities



Backing thriving energy businesses

Energy storage and battery applications

[Nexeon](#), based in Milton Park, is a world leader in engineered silicon materials for battery applications. Its Li-ion battery anode technology uses silicon instead of graphite, dramatically improving the performance of battery technology. It has raised over £200 million and has offices in Yokohama, Japan, as well as Oxford.

[Brill Power](#) is developing intelligent battery management and control technology to increase the lifetime, safety and sustainability of lithium-ion battery packs for stationary energy storage and electric vehicles. The University of Oxford spin-out raised \$10.5 million in its 2022 Series A round from investors including Shell Ventures and Climate KIC.

Battery materials technology specialists [EVM](#), which is headquartered in Australia, is creating unique integrated supply chains for the global rechargeable battery market. It has a key battery technology centre at Milton Park.

[Faradion](#), founded in Oxford in 2011, has led the way in developing sodium-ion battery technology. Founded on the premise that sodium-ion batteries are cheaper and safer than lithium-ion, in 2021 it was acquired by India's Reliance Industries for an enterprise value of £100 million. It is based at Begbroke Science Park, Sheffield and in Australia.

[WAE](#) has developed high performance batteries for Formula E racing. Acquired by [Fortescue Metals](#) in 2022, it is setting up an advanced battery plant for heavy vehicles in Kidlington and Banbury.

[Habitat Energy](#) specialises in storage optimisation and trading renewables and operates in the USA, Australia, and in the UK, where its base is at the [Oxford Centre for Innovation](#). It was acquired by Quinbrook Infrastructure Partners in 2021.

Croatian company [Rimac Technology](#) chose Witney as a base for its rapidly-growing [Rimac Energy](#) division. A pioneer in advanced battery energy storage systems, it specialises in advancing Battery Energy Storage Systems (BESS) technology and delivering high-efficiency solutions.

Hydrogen

Hydrogen has the potential to play an important role in meeting net-zero targets. Demand for hydrogen is projected to grow almost ten-fold between now and 2050, and the hydrogen fuel cell market is forecast to grow more than three-fold through to 2027.

The [Green Ammonia Demonstrator](#) at the [Rutherford Appleton Laboratory](#) brings together all the technologies required to demonstrate the complete ammonia energy cycle. The project is helping to better understand the potential of ammonia for the rapid deployment of a bulk, carbon-free hydrogen network. Created in partnership with the Science and Technology Facilities Council, the University of Oxford, Cardiff University and Siemens, the system uses water electrolysis to provide a hydrogen supply and extracts nitrogen from the air.

[Siemens](#) selected Harwell for its £1.5 million proof-of-concept plant that is testing the use of ammonia as a way to store and transport hydrogen in energy systems.

[Johnson Matthey](#) chose Culham Science Centre for its hydrogen business unit, which is accelerating the scale-up of its growing green hydrogen business and future battery materials technology.

[Fortescue](#) has opened a new state-of-the-art technical innovation centre in Kidlington to develop and produce batteries for the first generation of [Extreme H](#), a new motorsports series beginning in February 2025.

Solar energy

[PowerMarket](#) is a deep-learning mapping and monitoring technology which leverages satellite data to identify ideal solar sites and forecast generation for grid management. Incubated through Oxford University Innovation, it received initial grant funding from the European Space Agency, and seed funding from Seraphim Space Camp, Techstars and venture capital company QVentures.

[Oxford Photovoltaics'](#) revolutionary perovskite solar cell could lead to 30% more efficient mass-produced energy. Its low cost, highly efficient photovoltaic technology integrates with standard silicon solar cells to dramatically improve their performance. Winner of many



awards, including GlobalCleantech100, it has received over \$140 million in funding from a range of institutions including German solar specialist Meyer Burger and Chinese wind turbine maker Goldwind.

Wind energy

There is an active wind energy R&D community within the UK, centrally supported by the The Engineering and Physical Sciences Research Council (EPSRC) and Innovate UK. The [University of Oxford](#) runs the EPSRC Centre for Doctoral Training (CDT) in Wind and Marine Energy Systems and Structures in collaboration with the universities of Strathclyde and Edinburgh. The [Oxford Martin School](#) brings together researchers on energy issues to conduct interdisciplinary studies on the technical, market, social, and policy challenges for integrating renewables.

[TCI Renewables](#), with headquarters in Abingdon, develops, constructs and operates wind energy projects across the UK and North America.

[Sygensys](#) is developing demand management and energy storage system solutions to allow effective use of renewable energy sources including wind and solar.

Nurturing growth

The [Faraday Institution's](#) Fast Start projects have helped to accelerate battery technology through research into new materials, increased capacity and weight reduction. It has supported innovators such as the [Nextrode](#) consortium of five university and six industry partners led by the University of Oxford, a project to revolutionise the way battery electrodes are manufactured and to make EV batteries longer-range and more durable.

[Energy Superhub Oxford](#) (ESO), a three-year £41 million project announced in 2019, is one of four demonstrator projects part-funded (£10 million) through the government's Prospering from the Energy Revolution Challenge. ESO will showcase electric vehicle charging and smart energy management technologies. Projects include the UK's first transmission-connected battery. The hybrid lithium-ion/vanadium flow battery will support more renewables, increase grid resiliency and create a smarter, more flexible system. Its partners include Invinity Energy Systems, Kensa Contracting, Habitat Energy, and Pivot Power.

[Fastned](#), a Dutch-owned network of low cost fast charging stations, chose Oxford as one of its first UK locations.

[Mini-TESA](#) (The Energy Systems Accelerator) is a world-leading multi-disciplinary hub for energy transition. It is the home of [ZERO](#), Oxford University's zero-carbon energy research institute, which is partnering with businesses, academia, the public sector and social enterprises to accelerate the transition to a just zero-carbon energy system. Oxford's [Low Carbon Hub](#) social enterprise is also located here.

[Project LEO](#) (Local Energy Oxfordshire) is one of the most ambitious, wide-ranging and innovative smart grid trials ever conducted in the UK. It is looking at how to accelerate the transition to an energy system that doesn't rely on fossil fuels by piloting a flexible approach to electrical energy provision. The 18GWh Ray Valley Solar Park provides a crucial 'anchor load' of clean electricity generation as it demonstrates the potential for the coordinated use of local generation, storage and demand in decarbonising the energy system. Led by [SSEN](#) it is an [InnovateUK](#) partnership project.

Fusion

Oxfordshire is a world leader in fusion energy research and innovation. Backed by at least £400 million in funding from the government, the county is home to UKAEA's national fusion energy laboratory.

Operated by Culham Centre for Fusion Energy, the iconic Joint European Torus (JET) facility, a cornerstone of fusion energy for over 40 years, is now in the next stage of its lifecycle: decommissioning and repurposing. The learnings from this will continue to contribute to global fusion efforts for years to come including in France at ITER, the world's largest tokamak. The final phase of JET will offer UKAEA unparalleled insights into the process, and it will continue with a suite of other groundbreaking fusion projects at Culham including Mega Amp Spherical Tokamak Upgrade (MAST-U), a spherical tokamak design project focused on fusion energy efficiency, and Tritium Fuel Cycle (formerly H3AT), the UK's leading facility in tritium, a critical element in creating fusion. UKAEA projects at other sites include the Spherical Tokamak for Energy Production (STEP), the UK's prototype fusion powerplant, and CHIMERA, the world's first machine capable of testing components under fusion powerplant conditions.

The United Kingdom Atomic Energy Authority (UKAEA) is working with the US Department of Energy's Oak Ridge National Laboratory (ORNL) in an exciting £3 million, five-year partnership to better understand the performance and behaviour of materials required for use in future commercial fusion powerplants. Materials irradiated at the ORNL High Flux Isotope Reactor in the United States will be tested at ORNL and at UKAEA's Materials Research Facility at Culham.

- [Tokamak Energy](#) at Milton Park near Didcot, a spin-out from Culham Laboratories in 2010 has raised over £123 million of private investment and has expanded rapidly through access to Oxfordshire's world-leading clusters in fusion energy and high temperature superconducting magnets. It is building a new fusion energy advanced prototype with power plant-relevant magnet technology at a new purpose-built facility at Culham.
- [First Light Fusion](#), based in Begbroke, is researching energy generation by inertial confinement fusion. Spun out of the University of Oxford in 2011, Parkwalk Advisors and angel investors, the company has

Canadian company [General Fusion](#) is building a Fusion Demonstration Plant (FDP) at Culham, in a historic public-private partnership with support from UKAEA and a global consortium of industrial companies which will speed up the commercialisation of fusion technology with power plant-relevant demonstrations. At 70% scale, the FDP will heat hydrogen plasma fuel to fusion temperatures of 150 million degrees. Operations will begin in 2027.

raised a total of \$107 million, with its series C round in 2022 raising \$45 million from investors including Braavos Capital and Tencent. A new facility at Culham, developed jointly with UKAEA, will house its new net energy gain demonstrator Machine 4, its next milestone towards commercial fusion power development.

Superconducting magnets and cryogenics

Oxfordshire has a well-developed cluster in superconducting magnets and cryogenics. The [Oxford Centre for Applied Superconductivity's](#) Superconductivity Hub is a joint project between the [materials](#) and the [physics departments](#) of the University of Oxford, local industrial partners and research centres. Its aim is the discovery of novel superconducting materials, and it helps to train people in superconductivity skills. The superconductivity market is estimated to be worth £2.7 billion by 2027.

Oxfordshire is home to the most powerful concentration of cryogenic expertise in the world. Cryogenics are a critical enabling technology for fusion energy, maintaining low temperatures for superconducting magnets. Cryogenics has a broad range of applications, from food freezing and medicine to defence and security, in a market estimated to be worth [£17.4 billion by 2025](#) with a 6.8% CAGR. Our key companies include Oxford Instruments.

A skilled and professional workforce

Oxfordshire has the talent to enable companies to capitalise on ideas that will shape the future for the energy sector.

Key facts:

- Its world-class universities offer highly trained graduates, between them educating 42,000 students.
- Salary costs in the UK are competitively lower than other key global locations.
- The fusion sector alone employs more than 2,000 people.

As well as its two universities, there are highly-regarded technical colleges specialising in energy.

[University Technical College Oxfordshire](#) caters for students aged 14-19. It specialises in science and engineering and is backed by leading companies in these industries. It is the first school in the UK to open a state-of-the-art cryogenics laboratory.

[Abingdon & Witney College's](#) Advanced Skills Centre is a high-tech higher education hub dedicated to science and engineering training.

[Oxfordshire Advanced Skills](#), located at the Culham Science Centre, offers high quality training for apprentice engineers and technicians working in Oxfordshire's technology businesses. It runs a unique engineering manufacturing technician apprenticeship.



Plasma in the MAST spherical tokamak device.

Hotter than the sun

"We are delighted to be expanding here in Oxfordshire where we are able to recruit exceptional talent for Tokamak Energy. We pride ourselves on having a highly-skilled team of scientists and engineers with a vast array of knowledge, experience and determination." Jonathan Carling, CEO of Tokamak Energy.

[Tokamak Energy](#) is accelerating the development of efficient and affordable fusion power through its team of world-class fusion scientists and magnet engineers. Its rapid innovation approach uses the latest materials

and technology while building on decades of scientific research and experience to find a faster way to fusion. Their scalable technology could be rolled out across the world as a solution to one of humanity's greatest challenges: clean and sustainable energy for all.

In 2022 it achieved a world first: 100 million degrees in a compact spherical tokamak – the first time a privately-owned company has delivered this milestone.

It is beginning to test a world-first set of new generation high temperature superconducting (HTS) magnets.

A vibrant and diverse place to live

Climate leadership: Oxford is one of 18 cities globally to be highlighted for its climate leadership in the Renewables in Cities Global Status Report, which assesses cities' energy transition efforts worldwide.

Communities steeped in history: The UNESCO World Heritage site at [Blenheim Palace](#), Oxford's dreaming spires, and Banbury Cross of nursery rhyme fame are just a few of the landmarks dotted around the county.

Beautiful outdoor spaces: Many towns and villages sit within the Cotswolds, North Wessex Downs and Chilterns Areas of Outstanding Natural Beauty. Rivers and canals add to the landscape and host water-based activities.

Supremely well connected: The city of Oxford is an hour's drive from London and 45 minutes from [London Heathrow](#), the UK's largest airport. Trains run frequently from Oxford's two mainline stations, linking it to London in less than an hour as well as to Birmingham, and the north and the south coast.

A fusion of traditional and modern living: The historic streets of Oxford and thatched cottages in rural hamlets don't mean you have to live in the past - 97% of properties benefit from fibre broadband.

Museums and culture: A wide range of museums, galleries and theatres means you are never short of cultural opportunities to explore, including the [Ashmolean Museum](#) in Oxford and several National Trust and English Heritage properties.

Retail therapy: The [Westgate Oxford](#) shopping centre and [Bicester Village](#) offer a wide range of global brands alongside exceptional dining and leisure facilities. Small independent traders can be found on many high streets, offering boutique products manufactured locally and from further afield.

Excellent educational opportunities: In addition to the two universities, there are many fantastic schools in the state and private sector, ensuring choice for all.

Safe and welcoming communities: Newcomers are welcomed by communities with many people willing to offer help and advice, and the county also benefits from low levels of crime.

Literary, TV and film connections: Home to filming locations for productions including: Inspector Morse, Harry Potter, His Dark Materials and Downton Abbey. The annual Oxford Literary Festival celebrates world-class writers in the city of Lewis Carroll, CS Lewis, JRR Tolkien and Phillip Pullman.

Gastronomical delights: From high end cuisine offered by Michelin starred restaurants to a pint of locally brewed Hooky Ale poured in the village pub, there is no shortage of places to eat and drink.



Credit: A2Dominion

10 reasons to choose Oxfordshire for energy

1. Opportunities to collaborate with exciting spinouts from the University of Oxford.
2. Proven success in attracting international energy companies and a growing number of manufacturers and developers of electric motor and vehicle technology.
3. Track record of attracting inward investment from around the world.
4. World-class research facilities.
5. Thriving energy ecosystems, facilitating knowledge exchange.
6. World leading region for fusion energy research and innovation.
7. Flourishing low carbon energy sector, generating around £1.14bn a year.
8. Highly-educated population and technically-skilled workforce.
9. Region's low carbon economy employs 9,000 people.
10. Excellent connectivity to the rest of the UK and easy access to major airports.

Support for investors

Investors in Oxfordshire are supported by our inward investment team, which offers tailored assistance and a range of support including:

- Identifying commercial premises and co-ordinating property viewings
- Facilitating introductions to the University of Oxford and Oxford Brookes University
- Making introductions to Oxfordshire's science and research facilities
- Connecting businesses with professional service providers, business support organisations and sector specific networks.
- Offering assistance with graduate recruitment and training support including apprenticeships
- Providing ongoing support to Oxfordshire-based companies

Investment opportunities

Mini-TESA (The Energy Systems Accelerator)

Within the first stage of this world-leading multi-disciplinary hub for energy transition - which includes ZERO, Oxford University's zero-carbon energy research institute - lie many opportunities for partnerships with businesses and the public and third sectors to accelerate the transition to a just low-carbon energy system.

Fusion energy

Investors can collaborate with Oxfordshire's key research and innovation companies that are leading the race to help fusion energy power the world of tomorrow and are making technological breakthroughs.



The JET buildings at Culham. Credit: EUROfusion



Bicester Motion



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 @oxfordshirelep

 Oxfordshire Local Enterprise Partnership

