Energy Super Hub Oxford - 3-year Report: June 2025

In July 2022, Europe's most powerful electric vehicle charging hub, Energy Superhub Oxford, opened to the public offering fast and ultra-rapid charging for 42 vehicles at once. Connected to National Grid's high voltage transmission network via a four-mile underground cable connected delivering 10 MW of power.

Energy Superhub Oxford (ESO) is a £41m demonstration project with a powerful network of rapid electric vehicle charging, battery storage, low carbon heating and smart energy management technologies. Three years on, the project continues to inspire innovation in smart local energy systems, showcase successful collaboration and act as a catalyst for green projects.

"Urban decarbonisation is ground zero for the immediate emissions reductions needed to tackle the climate crisis. Energy Superhub Oxford provides a vision of the future, today. By delivering a world-leading project that cuts emissions across transport, power and heat, we are breaking new ground to help the UK reach net zero sooner."

Matt Allen, CEO and Co-Founder of Pivot Power

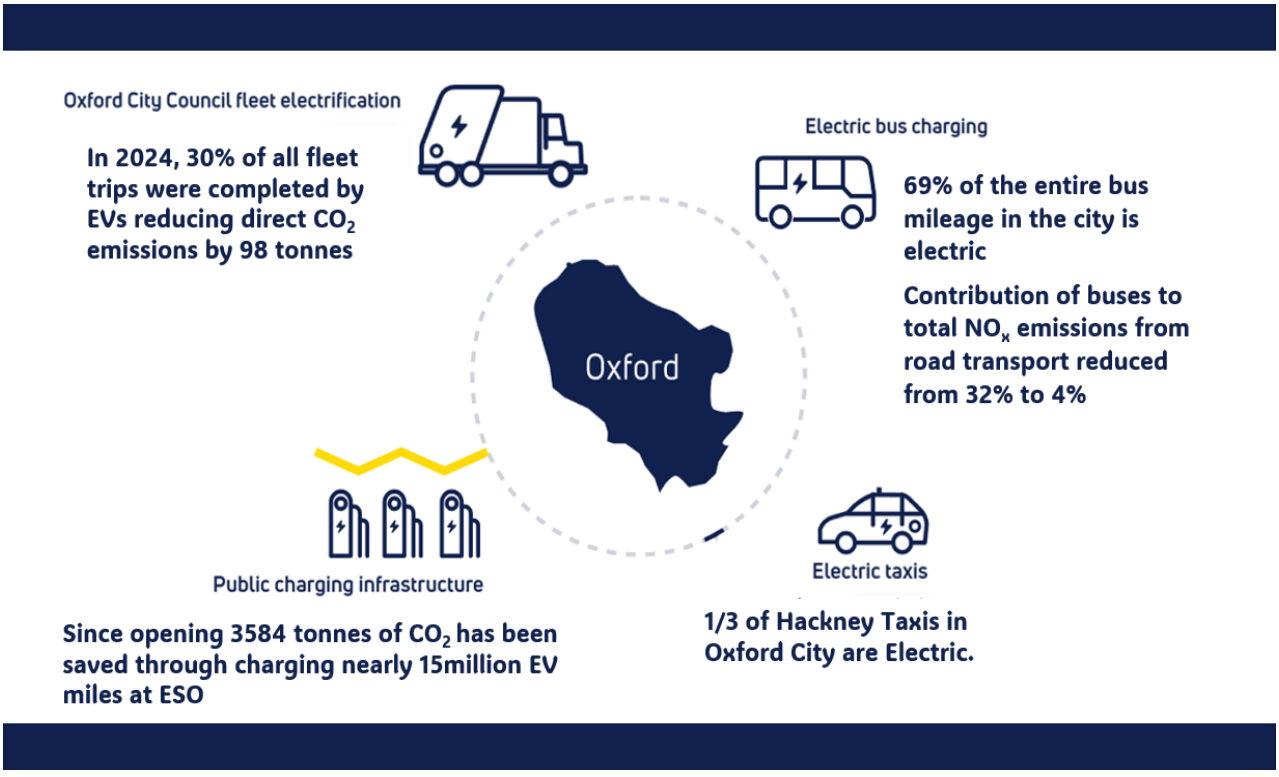
Contents

Overall Statistics

- Charging at ESO from opening to March 2025 (inclusive):
    - **Saved 3584 tonnes of CO2**
    - **Provided 4,266,388 kWh of electricity to vehicles**
    - **Charged nearly 15million EV miles**
    - **Completed 137,278 charging sessions equal to 135 sessions a day.**

- **69% of the entire bus mileage in the city is electric** as a result the contribution of buses to total NOx emissions from road transport in the city has now **reduced from 32% to 4%** - see the Oxford Source Appointment Study on the Oxford City Council website

- ODS Fleet: EV trips counted for 30% of total fleet trips in 2024 **reducing direct CO2 emissions by 98 tonnes.**

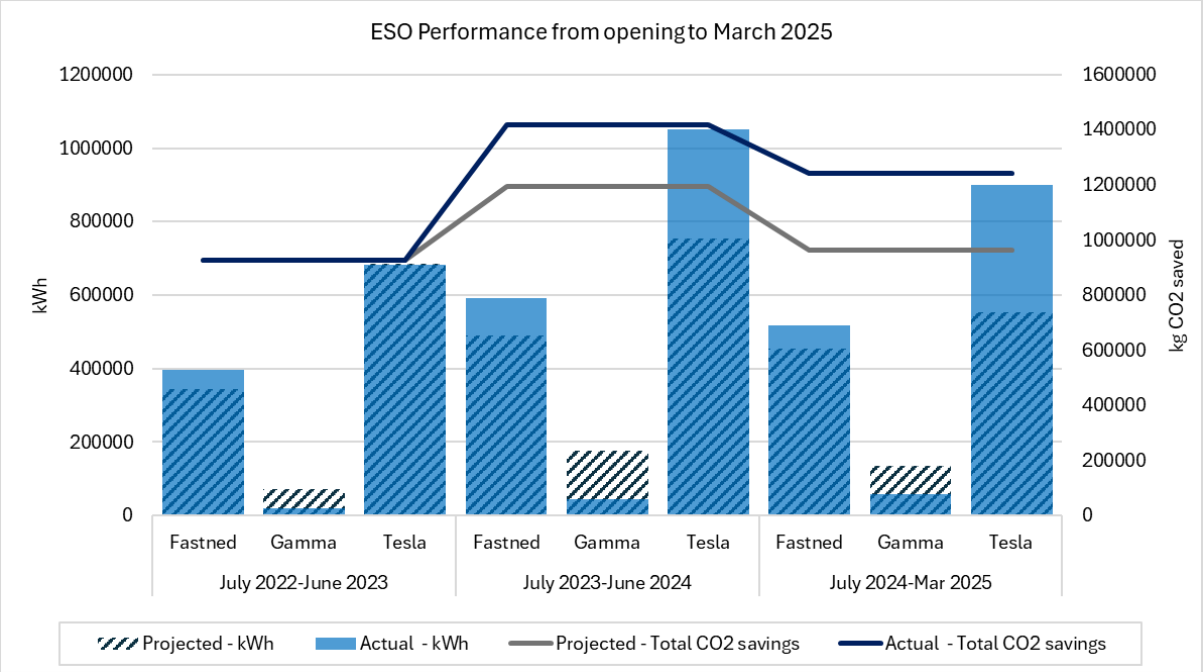


Oxford is at the forefront of EV adoption

Charging at ESO

Since opening, rapid charging at ESO has excelled beyond projections with charging visits continuing to increase year on year. This has resulted in total carbon savings 1509 tonnes

greater than expected.



Taxis

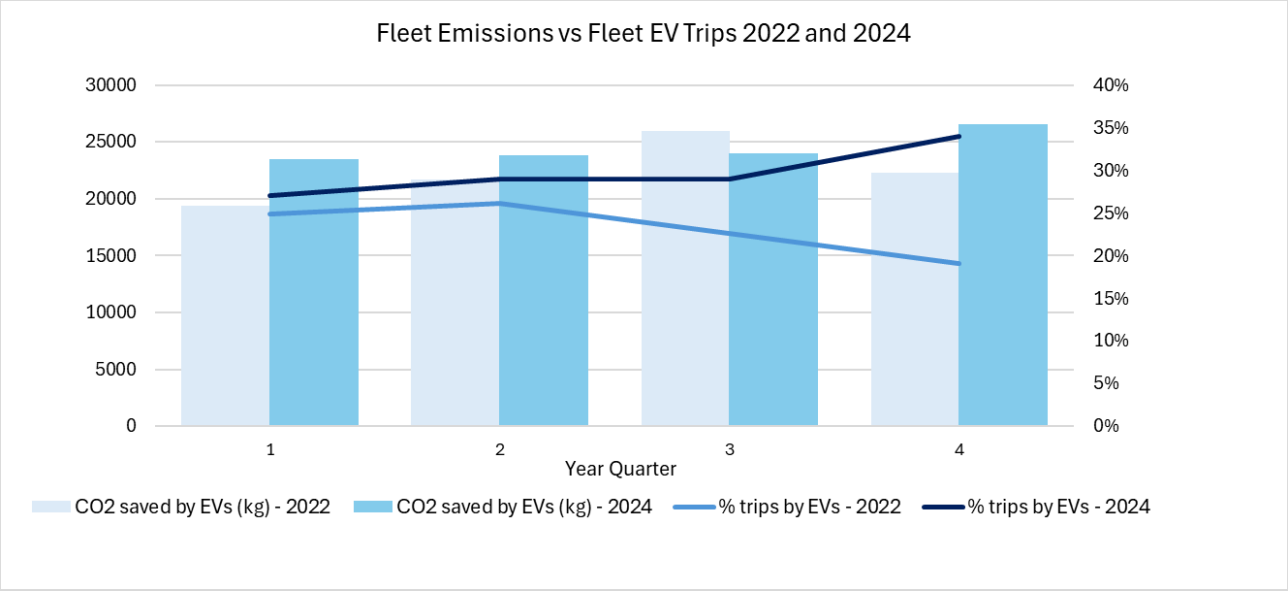
Through ESO, Oxford City Council was able to offer licenced drivers a £5,000 grant towards the purchase of ultra-low emission vehicles (ULEV). These factors led to higher-than-expected take-up of ULEV taxis during the project. Currently, one third of Hackney Taxis in Oxford City are Electric.

ODS Fleet

Prior to the ESO project, ODS had 11 EVs on fleet, all of which were cars. ESO's contribution of over £1.1m accelerated the electrification of the fleet and enabled the procurement of 40 additional EVs across a full range of vehicles. These EVs reduced the fleet's carbon footprint by at least 56 tonnes in 2022, plus reductions in other pollutants and noise levels – see the Energy Superhub Oxford: final report - ORA - Oxford University Research Archive.

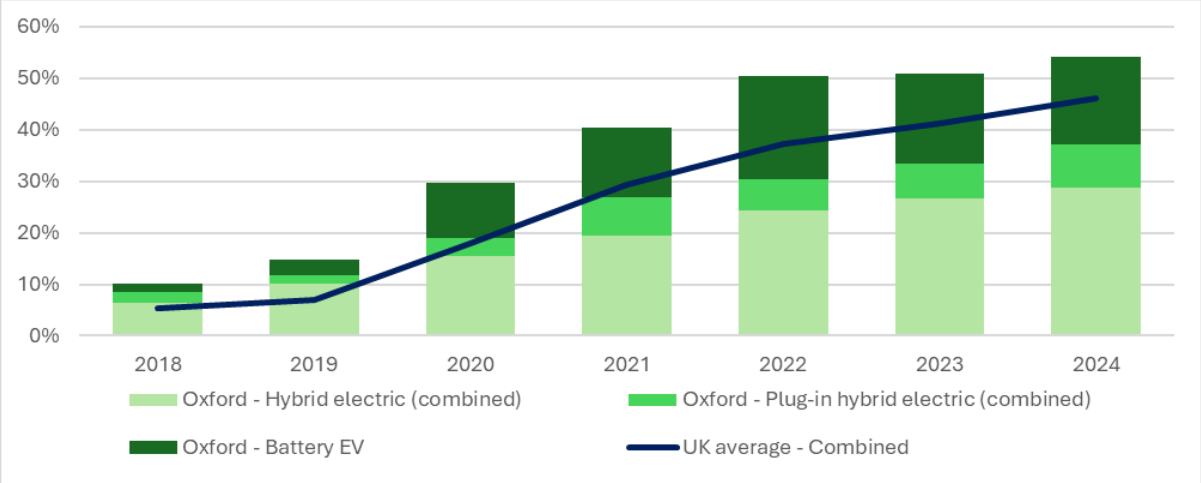
Since then, ODS hit and exceeded their target to electrify 25% of the fleet by 2023. Currently, 35% of the fleet is electric including 1 refuse collection vehicle, 1 subcompact sweeper, 1 milk float converted to street cleaner pressure wash, 1 mini digger, a handful of small off-road utility vehicles. ODS utilise ESO to charge some fleet vehicles.

In 2024, EV trips counted for 30% of the total fleet trips. These reduced direct CO2 emissions by 98 tonnes. ODS aims for the fleet to be net-zero by 2030.



Public

EV uptake in Oxford remains high with the share of battery electric vehicles for new car registrations in 2024 (17%) staying higher than the UK average (15%) – see VEH9901: Licensed road using cars and light goods vehicles by local authority, body type, fuel type, CO2 band, keepership, and year of first registration.



ESO as a Catalyst

Electric Buses

In 2024, a partnership between Oxfordshire County Council and bus operators launched the ambitious project to create one of the biggest UK fleets of electric buses outside of London. The project was funded by the county council (£6m), bus companies Stagecoach and Oxford Bus Company (combined £45m) and through successful application to the Department for Transport's Zero Emission Bus Regional Areas (ZEBRA) scheme (£32.8m). As one of only 12 local authorities to successfully apply for ZEBRA funding, ESO's underground cable proved fundamental. **The ESO private wire powers the bus depot's 8MVA substation providing**

enough electricity to charge all 159 buses, enough for each bus to drive up to 200 miles per day. Through this project, 159 electric buses have been delivered in Oxford completing 69% of the entire bus mileage in the city reducing the contribution of buses to total NOx emissions from road transport in the city from 32% to 4% - see the Oxford Source Appointment Study on the Oxford City Council website.

> "Electrifying Oxford's buses by taking advantage of the high voltage connection enabled by Energy Superhub Oxford will significantly improve air quality in and around the city and boost the already key role that buses play by replacing cars. Together, the changes brought about by Energy Superhub Oxford will have truly accelerated the region's journey towards net zero."
>
> **Marianne Costigan, Head of Private Wire at EDF Renewables UK**

Events

ESO has continued to promote electric vehicles through hosting the 'EVs are for Everyone' event in 2023 and serving as one of the final checkpoints for the EV Rally in 2024.

EVs are for EVeryone 2023 aimed to demystify and promote electric vehicle adoption by offering hands-on experience for residents and businesses. The event, organized by Oxford City Council and Oxfordshire County Council, provided opportunities to test drive various EVs, learn about ownership options, and explore available public charging infrastructure. Working with local partners, attendees could test drive up to six different affordable cars and vans from a range of models while friendly experts and local electric vehicle champions were on hand to share their tips and advice. Exhibitors included EV car shop, BMW North Oxford, Go Green Autos, Drive electric, ODS, CoWheels car club, and many more. The event was attended by roughly 400 residents.

EVs are for EVeryone 2023 in numbers

EV Rally 2024 saw 56 EV drivers stop off at ESO to charge up at one of Fastned's chargers, stretch their legs and grab a slice of pizza as part of their four-day tour around the country. These drivers showed that it's possible to travel the length and breadth of the UK in an electric vehicle.

Wider Impacts

The impacts of ESO have stretched beyond the limits of Oxford City, showcasing Oxford as a launch pad for innovation, a place that has vision and city that works with small business on big projects.

Battery Storage

Battery storage is essential for the future operation of a distributed grid. ESO is home to the world's largest hybrid energy battery storage system created by Invinity.

Since 2022, Invinity has deployed its **battery storage technology at more than 15 sites globally** dispatching more than 5.5 gigawatt hours of energy worldwide. Invinity cite ESO as playing an important role as a key reference site for many of Invinity's subsequent customers.

Private Wire

The private wire, constructed and owned by EDF Renewables, enables ESO to be the first transmission-connected charging hub in the UK, offering up to 10 MW for ultra-rapid charging. EDF Renewables committed almost £200m of investment funding to replicate the transmission-connected model at five other sites in the UK. Once complete**, the network could provide almost 10% of the energy storage that the UK is predicted to require by 2035.**

Heat Pumps

As part of ESO, Kensa Contracting installed 57 ground source heat pumps (GSHPs) in 57 social housing properties in Blackbird Leys, an Oxford suburb and a further five GSHPs coupled with heat-batteries, known as Kombi systems, were trialled in Sonning Common, South Oxfordshire. Overall, tenants expressed high levels of satisfaction with their new heating and hot water systems and several tenants reported saving up to 50% on their energy bills. **Three years on and all heat pumps are still in place providing low-cost, low-carbon heating.**

The 'Kombi' systems do not require hot water tanks and are therefore smaller than conventional GSHPs. The success of the ESO demonstration has led Kensa to incorporate Kombi units into its strategic growth plans. Kensa were successful in achieving Heat Pump Ready Project Stage 2 funding to bring up their TRL to manufacturing stages.

“Findings from both the ESO project and the HPRP have been instrumental for our future heat pump designs and running expectations.”

Amy Featherstone, Innovation Manager at Kensa

Concession Contract

Prior to ESO, there were no standard concession style legal contracts available for use by charge point companies and local authorities; everything had to be created from scratch, with terms replicated across the three operators. This proved a timely and costly process; however, the concession contract has since been used as a basis for the Concession Contract template created as part of Oxford City Council’s Electric Vehicle Dynamic Purchasing System (EV DPS) an efficient route set up to support Public Sector Organisations in their procurement of EV infrastructure. To date, the contract template has been used by at least 18 public sector organisations saving the public sector tens of thousands of pounds in legal fees.

Summary

Energy Superhub Oxford delivered a range of innovations, spanning power, heat, transport and battery storage. Three years on and ESOs impact continues to be felt not only in the city but also far beyond the city limits. Within Oxford City ESO continues to reduce carbon and nitrogen emissions through EV charging and electrification of fleet vehicles, buses and taxis. Outside of Oxford, ESOs work of pioneering innovative technologies has helped accelerate them into the mainstream bringing further emission reductions and energy efficiencies around the UK.

“It is great news that three years on, Energy Superhub Oxford is continuing to show what is possible when innovation, collaboration, and climate ambition come together.

Each year the number of electric vehicles using our Redbridge superhub continues to grow, and the project has helped to power Oxford’s new zero-emission buses fleet that are helping to improve air quality. I look forward to seeing how this project continues to reduce emissions across Oxford”

Councillor Anna Railton, Deputy Leader and Cabinet Member for a Zero Carbon Oxford